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The role of village-owned enterprises (BUMDes) ‘Restu Ibu’ in community empowerment in Ngambon Village, Bojonegoro Regency

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ARTICLE INFO	ABSTRACT
Article history Received: 2025-02-04 Revised: 2025-02-09 Accepted: 2025-02-26 Published: 2025-03-04 Keywords BUMDes Empowerment Participation strategy Kata Kunci BUMDes partisipasi pemberdayaan strategi	<i>BUMDes as a commercial organization established by the village government initiative based on the principles of deliberation, collaboration, community participation, transparency, empowerment, accountability, and sustainability. This study aims to analyze the roles and obstacles faced and describe the strategies of BUMDes managers in improving the development of Business Units in BUMDes Restu Ibu in Ngambon Village, Bojonegoro Regency. The data analysis method used consists of three flows consisting of data reduction, data presentation, conclusion drawing or verification. The results of the study show that BUMDes Blessing Ibu Ibu Ngambon Village in empowering the community still lacks community participation in advancing business units managed by BUMDes, lack of socialization related to BUMDes business units and institutional management which is still very poorly run. BUMDes management strategies in an effort to empower the community's economy through planning, organizing, mobilizing, and supervising activities. Village-Owned Enterprises (BUMDes) Restu Ibu is advised to encourage other members to work harder and the role of quality human resources to improve the quality of BUMDes in a more professional direction.</i> Peran Badan Usaha Milik Desa (BUMDes) Restu Ibu dalam Pemberdayaan Masyarakat di Desa Ngambon Kecamatan Ngambon Kabupaten Bojonegoro. BUMDes sebagai organisasi komersial yang didirikan prakarsa pemerintah desa berdasarkan prinsip musyawarah, kolaboratif, partisipatif masyarakat, transparansi, pemberdayaan, akuntabilitas, dan keberlanjutan. Kajian ini bertujuan untuk menganalisis peran dan kendala yang dihadapi serta mendeskripsikan strategi pengelola BUMDes dalam meningkatkan perkembangan Unit Usaha pada BUMDes Restu Ibu di Ngambon Village, Kabupaten Bojonegoro. Metode analisis data yang digunakan terdiri dari tiga alur yang terdiri dari reduksi data, penyajian data, penarikan kesimpulan atau verifikasi. Hasil penelitian menunjukkan bahwa BUMDes Restu Ibu Ngambon Village dalam memberdayakan masyarakat masih kurang melibatkan partisipasi masyarakat dalam memajukan unit usaha yang dikelola BUMDes, kurangnya sosialisasi terkait unit usaha BUMDes dan manajemen kelembagaan yang masih sangat kurang berjalan dengan baik. Strategi pengelolaan BUMDes dalam upaya pemberdayaan ekonomi masyarakat melalui kegiatan perencanaan, pengorganisasian, penggerakan, dan pengawasan. Badan Usaha Milik Desa (BUMDes) Restu Ibu disarankan lebih mendorong anggota lainnya agar bekerja lebih giat serta peran SDM yang berkualitas guna meningkatkan kualitas BUMDes ke arah yang lebih profesional. Copyright © 2025, Oktaputri, et al This is an open access article under the CC-BY-SA license 
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INTRODUCTION

BUMDes (Badan Usaha Milik Desa) is a self-managed commercial organization operated independently by villages with the support of village apparatus, village organizations, and the community (Agunggunanto et al., 2016). BUMDes is established based on village government initiative, guided by principles of consensus, collaboration, community participation, transparency, empowerment, accountability, and sustainability with membership-based and self-help mechanisms (Hakim & Svinarky, 2022). One of the challenges in developing BUMDes is the community's ability to maintain BUMDes through the business units they run so that they continue to develop (Rahayu et al., 2024). Crucially, BUMDes management needs to be conducted in a professional and autonomous manner (Ikhwan et al., 2021). The effort of Ngambon Village government to strengthen local economy through sustainable BUMDes development began with the enactment of regulations concerning BUMDes itself.

The establishment of BUMDes is also based on Law Number 6 of 2014 concerning Villages, Article 87 paragraph (1) which states: "Villages may establish a Village-Owned Enterprise called BUMDes", paragraph (2) states: "BUMDes is managed in a familial and mutual cooperation manner", and paragraph (3) states: "BUMDes may conduct activities in the economic and/or public service fields in accordance with the provisions of laws and regulations. The potential of BUMDes as a self-managed village enterprise can ensure the welfare of the village community (Arindhawati & Utami, 2020). Rural communities can realize development plans without harm and achieve better income through innovation in natural resource distribution and policies, facilitated by Village-Owned Enterprises (BUMDes) (Winarsi et al., 2018). Creating a business environment that promotes healthy economic growth, enhances the welfare of members and surrounding communities, and contributes to national economic development (Ababil & Yulistiyo, 2022).

One of the BUMDes established by Ngambon Village resulting from the BUMDes Ngambon Village meeting is called BUMDes Restu Ibu. The lack of a strong role of BUMDes in facilitating BUMDes business units or local Small and Medium Enterprises (SME) partners (Athief et al., 2023). Efforts of BUMDes management with a spirit of mutual cooperation based on Village Law and the important role of BUMDes Restu Ibu in improving the welfare of village communities. This work aligns with the Sustainable Development Goals (SDGs) program which supports the 8th program, i.e facilitating decent work and economic growth (United Nation, n.d.).

Therefore, the project team are interested in further examining whether BUMDes Restu Ibu is truly pure in managing the Ngambon Village community and village government, and whether the benefits from these efforts can be evenly distributed to the Ngambon Village community. Based on these phenomena, the author investigates the role of BUMDes in empowering the Ngambon Village community, Ngambon District, Bojonegoro Regency, to provide problem-solving guidance for existing issues. This research aims to achieve its intended goals and be beneficial both theoretically and practically.

METHOD

The data analysis method consists of three simultaneous activities: data reduction, data presentation, and conclusion drawing or verification (Tse et al., 2018). A more detailed description of these three activities is as follows:

1. Data Reduction: The researcher selects, focuses, and simplifies all the data obtained.
2. Data Presentation: The data about BUMDes Restu Ibu is presented in short descriptions, charts, relationships between categories, and the like. In qualitative research, the data is often presented in the form of narrative text (Butina, 2015). In addition to text, information be presented as networks. The results of observations, interviews, and documents obtained from the research site are organized.
3. Conclusion Drawing: This is used to answer the research formulated in the focus of the study. Conclusions in qualitative research are expected to be new findings that provide a description of ambiguous problems, making them clear after investigation (Ranney et al., 2015).

RESULTS AND DISCUSSION

A. The Role of BUMDes Restu Ibu in Empowering the Community of Ngambon Village

In empowering the community of Ngambon Village, BUMDes Restu Ibu plays the following roles:

BUMDes Assists Micro, Small Medium Enterprise (MSME) Actors

The roles and functions of BUMDes for the village government and village community include intermediation, assistance, social, and budgeting (Handayati in Lazuardiah et al., 2020). According to the interview data, BUMDes Restu Ibu functions both as a facilitator and a service provider. The functions of BUMDes Restu Ibu include the following:

- a. BUMDes facilitates all forms of planning activities for business entities to be established and assists the village community in improving their welfare through business units established by BUMDes with the approval of the Village Government (Lestari et al., 2023). For instance, the Village Market business unit facilitates the community in conducting daily trade transactions and the Banana Market. BUMDes Restu Ibu also provides services to the community in fulfilling marketing needs.

- b. BUMDes as a Mediator In managing the business entity, BUMDes acts as an intermediary to realize the proposed business plans (Lestari et al., 2023). BUMDes Restu Ibu mediates by cooperating with shops or supermarkets that purchase MSME products. As a mediator, BUMDes communicates with shops or supermarkets regarding the MSME products, monitors the quality of the products to be marketed, and ensures they meet consumer expectations (Syahza et al., 2021).
- c. BUMDes as a Motivator, this role is seen as the forefront and pioneer of the business entity to motivate the community and village government to participate actively and provide input on the future of BUMDes (Lestari et al., 2023). BUMDes acts as a motivator by organizing business training sessions annually (Sofyani et al., 2019). The purpose of the business training provided by BUMDes is to drive the economy by fostering the entrepreneurial spirit of the community and enhancing their welfare (Kania et al., 2021).

This study provides an overview of the field data collection results discussing the role of BUMDes in Community Empowerment. Here, "role" refers to the dynamic aspect of a status or position. If someone has fulfilled their rights and obligations, it means they have played a role. This study aims to evaluate the extent of BUMDes's role in Community Empowerment and the challenges faced by BUMDes in this context. The information is gathered through interviews with informants from BUMDes Restu Ibu management who can provide relevant insights. BUMDes Restu Ibu was established in 2018 with bylaws and regulations in place, complying with laws until 2020.

The establishment of BUMDes in Ngambon Village aims to enhance the village economy, increase village original income (PAD), improve the management of village potential according to community needs, and become the backbone of rural economic growth and distribution. The establishment and management of the Village-Owned Enterprises (BUMDes) seek to achieve these objectives. The vision of BUMDes is to realize the welfare of the village community through the development of economic enterprises in Ngambon Village. BUMDes manages program funds that enter the village, particularly revolving funds, primarily aimed at poverty alleviation and the development of rural economic enterprises.

Based on the data obtained by the researcher during field observations, it can be said that the role of BUMDes Restu Ibu in enhancing the potential of Ngambon Village is good but not yet optimal. BUMDes Restu Ibu is still focused on a few business units, including the management of the Ngambon village market, while the units for trading agricultural products and MSMEs have not yet been properly managed and utilized can be seen in the food processing sector. Therefore, synergy between BUMDes, the Village Government, and the community is essential to realize an independent, empowered Ngambon Village that can improve the welfare of its people through the local potential possessed by the village.

BUMDes Restu Ibu in Ngambon Village, established in 2018, initially had only one business unit, which was the management of the Ngambon Village Market. Over the years, the management of the Ngambon Village Market has continued to develop. Subsequently, BUMDes Restu Ibu expanded into trading agricultural products and marketing MSME products of Ngambon village residents. In an explanation provided by Mr. A, a key informant, a question arose about the purpose of establishing BUMDes Restu Ibu in Ngambon Village. According to his response, BUMDes Restu Ibu aims at Community Empowerment, catering to the community's need for better trading facilities and parking spaces. Therefore, BUMDes Restu Ibu manages the Ngambon Village Market comprehensively to improve community welfare. Following this, a question about the membership of BUMDes Restu Ibu was raised. Mr. A stated:

"The participation of the government, community leaders, the Village Consultative Body (BPD), and the Village Community Empowerment Institute (LPMD). It also states that the Village Head and the Head of the Welfare Section are the two representatives from the village government in BUMDes Restu Ibu.



Figure 1. Interview with BUMDes Restu Ibu management

With the presence of BUMDes Restu Ibu, community empowerment is significantly supported, leading to a more self-sufficient economy for the community (Ridlwani, 2015). Then, a question arose about the role of BUMDes Restu Ibu in community welfare and economic empowerment. Mr. A explained:

"Discussing its role, it's premature to view it as having a broader impact at this stage. Currently, BUMDes Restu Ibu primarily manages the village market and will slowly expand into supporting marketing and developing local community-owned businesses. Furthermore, the business units established here can offer job opportunities for the community. However, regarding community empowerment in Ngambon Village, its main contribution is through providing support and assistance."

From the above answer, it can be concluded that the role of BUMDes Restu Ibu has not yet developed rapidly in Ngambon Village. Its focus is more on managing the market, supporting marketing efforts, and developing the business potential of the community.

BUMDes Provides Capital to Business Units

The management capital of BUMDes business units consists of funds provided by BUMDes Restu Ngambon, adjusted according to BUMDes financial capabilities. BUMDes is a village economic enterprise managed by the community based on the village's potentials. According to Fay in Hawa et al. (2022), BUMDes plays the following roles in enhancing community economic development: (1) Developing and managing village potentials, as well as enhancing the economic capabilities of the village community to increase their income; (2) Actively improving the quality of life of the community; (3) Strengthening the community's economy as a foundation for national economic strength and resilience, with BUMDes playing a crucial role; and (4) Building and enhancing community income and welfare by assisting them in increasing their earnings, thereby achieving prosperity for the community.

On the other hand, PPP BUMDes (Evi et al., 2022; Hasanah et al., 2021) describes the roles of BUMDes through several aspects aligned with its goals: (1) Service-Profit-Sustainability; (2) Accountability-Village Asset Development; (3) Improving the standard of living of administrators, commissioners, and the community; and (4) BUMDes compliance with regulations and laws. As a partner of village governments in realizing economic plans, BUMDes is expected to meet the community's needs in business development. BUMDes is an interpretation of village autonomy, namely that the village has authority over village management to create village welfare (Dewi & Pradana, 2024). To ensure that BUMDes's presence in the village goes beyond formality, it should actively contribute to achieving its initial goals upon formation.

The presence of BUMDes can support the rural community's economy, particularly by synergizing with MSME (Micro, Small, and Medium Enterprises) and other BUMDes business units within the village (Permana et al., 2023). Currently, there appears to be separate operations between BUMDes and MSME or other BUMDes business units, and the involvement of funding has not fully reached all MSME and BUMDes units in the village. Therefore, there is a need for synergy between BUMDes, MSME, and other BUMDes business units to advance the village's economic development. In relation to the above, there are three aspects in the development of MSME and BUMDes business units: input, process, and output.



Figure 2. Marketing Facilitator of MSME Products Fostered by BUMDes

The input aspect relates to accessibility to raw materials, determining how effectively MSME and BUMDes business units can access basic production materials and labor. The process aspect concerns production or service delivery processes. Efficient and effective management of MSME or BUMDes business units is likely to optimize the production process or the revenue generated by these units. The output aspect is tied to the products or services produced and how entrepreneurs and managers of BUMDes business units can market them. Enhanced marketing accessibility often leads to better absorption of products or services in the market through strong connections with BUMDes.

Based on the findings, the priority policy strategies of BUMDes in developing MSME (Micro, Small, and Medium Enterprises) and BUMDes business units are based on the existing conditions in Ngambon Village. These priorities are categorized into five aspects: business environment (cultural, social, political, and security aspects), financing, labor, technology and innovation, and marketing. BUMDes has a distinct role in each of these aspects. In terms of the business environment, there are three priority policies that BUMDes must undertake to develop MSME and BUMDes business units in Ngambon Village: a. Facilitating ease of licensing services for BUMDes related to MSME and BUMDes business units. b. Ensuring a conducive security environment to support business development. c. Advocating for local government policies that guarantee a stable social environment.

Next, in terms of financing, there are three priority policies that BUMDes must adopt to develop MSME and BUMDes business units in Ngambon Village: a) There is a need for Pemdes Ngambon policy to mediate between business actors and parties providing financing. b) There is a need for ease of access to financing from non-bank parties for business actors. c) There is a need for ease of access to financing from banking institutions for business actors. Following that, in the aspect of labor, there are three priority policies that BUMDes must adopt to develop MSME and BUMDes business units in Ngambon Village: a) There is a need for a minimum wage policy that benefits both business actors and workers. b) Ngambon Village Government needs to provide training facilities for workers. c) Training is needed for all members. Moving on to innovation technology, there are two priority policies that BUMDes must adopt to develop MSME and BUMDes business units in Ngambon Village: Every business actor must have mastery of marketing technology, and Pemdes needs to provide incentives for innovative business actors. Furthermore, in the marketing aspect, there are two priority policies that BUMDes must adopt to develop MSME and BUMDes business units in Ngambon Village: a) It is important to train marketing innovation, especially for MSME business actors and BUMDes business units. b) It is important to have an association as a social capital strength for business actors and managers of BUMDes business units.

Activities of BUMDes in Empowering the Community of Ngambon Village

BUMDes Restu Ibu in Ngambon Village undertakes various activities aimed at empowering the local community:

1. Counseling and Awareness

BUMDes conducts counseling sessions to educate the community about its establishment and the business units it manages (Ikhwansyah et al., 2020). These sessions also aim to raise awareness and encourage community involvement in these initiatives. Mr. Salim, the director of BUMDes Restu Ibu, emphasizes the importance of these sessions in aligning market retribution management and agricultural business initiatives with community needs.

2. Entrepreneurship or Skills Training

Training conducted by BUMDes in collaboration with the head of the Family Welfare Empowerment is aimed at enhancing the quality of human resources in the community of Ngambon Village. The training program aims to provide understanding to the community that entrepreneurship activities can enhance the local economy. Mrs. Sri Wahyuni, the

treasurer of BUMDes, mentioned that despite the modest scale of these entrepreneurship trainings, they provide valuable insights to the people of Ngambon Village.

Upon analysis, BUMDes Restu Ibu plays a significant role in enhancing community empowerment in Ngambon by assisting individuals and groups in achieving satisfactory living standards, fostering personal and social relationships that allow them to develop their full potential, and improving welfare in line with the needs of their families and communities. This highlights BUMDes Restu Ibu as both an economic and social institution dedicated to enhancing the welfare of the village community and fostering social capital. Impact of BUMDes Restu Ibu in Empowering the Community: a.) Creating job opportunities for the people of Ngambon Village. b.) Through training programs conducted by BUMDes, providing insights and skills to the community to innovate in processing agricultural and livestock products to increase their economic value. c.) Making Ngambon Village known to a wider audience through one of its business units, "Pasar Pisang Ngambon Village" (Ngambon Banana Market). d.) Facilitating access for the community to engage in trade transactions through its business units. e.) Increasing productivity in community economic activities and effectively utilizing Ngambon Village's assets. f.) Encouraging an increase in the Village Original Income (PAD) of Ngambon Village.

From the above description, it can be said that BUMDes Restu Ibu falls into the category of well-performing BUMDes because it has provided numerous benefits to its community members. This aligns with the objectives of BUMDes as stipulated in the Minister of Village and Disadvantaged Regions Regulation Chapter II Article 3, including: (1) improving village economies; (2) utilizing village assets for the welfare of the community; (3) developing community businesses; (4) creating job opportunities for village residents; (5) increasing community income and village original income; and (6) enhancing the welfare of village communities (Triyo et al., 2020). BUMDes not only assists in village governance but also meets the needs of the village community (Murwadi et al., 2017). BUMDes is capable of performing multiple roles simultaneously, such as trade, service provision, and other economic development activities (Sani & Syamsuddin, 2021).

B. Challenges or Obstacles Faced by BUMDes Restu Ibu in Empowering the Community of Ngambon Village

Based on field observations conducted at BUMDes Restu Ibu in Ngambon Village and interviews with relevant parties, it can be explained that there are indeed challenges or obstacles in the role of BUMDes Restu Ibu in enhancing the economic welfare of the community. This is evident from several programs implemented by BUMDes, such as training and socialization, which have not been running optimally. Government policies oriented towards the welfare of the lower-income community aim to improve their economic conditions. However, the existing policies are perceived to have not had an optimal impact on the lower-income community. Consequently, the government has established economic institutions at the village level. Village organizations are also crucial in supporting economic strengthening and community empowerment. The presence of numerous obstacles within these institutions, such as the following, contributes to the issues faced:

1. Low Community Participation in Advancing BUMDes Managed Businesses

Community participation is a crucial factor in building BUMDes Restu Ibu, presenting a challenge for the Ngambon village government to find ways to enhance it. There is a need for the Ngambon village government or BUMDes managers to conduct socialization sessions about BUMDes, aiming to educate the community of Ngambon village and influence their perceptions towards BUMDes.

2. Lack of Capital in BUMDes

The MSME workshop activities aim to provide education on entrepreneurship, but on the other hand, the community also seeks financial assistance to support their businesses (Valle et al., 2022). Another issue is the lack of human resources competency (HRD). From the perspective of strengthening human resources and organizational capacity, the focus is on the management or administrators of BUMDes Restu Ibu. A hindering factor in human resource development is the lack of training for BUMDes managers or administrators, such as management and entrepreneurial training. Training for BUMDes is crucial because its managers are pivotal in driving BUMDes operations (Ridhowati & Ratnasih, 2024).

This research report was conducted through direct interviews with the Chairperson of BUMDes as the informant. The informant highlighted challenges in Ngambon Village, particularly the low community participation in the business opportunities launched by BUMDes. Members of BUMDes Restu Ibu have been seeking solutions to address this issue. The solution proposed is to enhance the quality of human resources, particularly in marketing, within BUMDes Restu Ibu to accommodate community-initiated businesses. The challenges in managing BUMDes Restu Ibu can still be addressed to find the best solutions for the development of BUMDes, aiming to provide positive outcomes for the empowerment and welfare of Ngambon Village's community.

C. Strategies of Managers in Improving Business Unit Development at BUMDes Restu Ibu

The establishment of BUMDes Restu Ibu fundamentally aims to empower economic potential in the village, supporting the community from sourcing raw materials, providing equipment, to promotional activities. These efforts are essential for production and economic activities in Desa Restu Ibu. The question then arises: what strategies do BUMDes Restu Ibu managers employ to enhance business unit development. Based on interviews with the BUMDes chairperson, four primary objectives for establishing BUMDes were identified: enhancing village economies, increasing local revenues, optimizing village potentials to meet community needs, and serving as the backbone for community economic growth. The establishment and management of BUMDes reflect productive village economics conducted cooperatively, participatively, emancipatorily, transparently, and accountably. As a village-operating economic institution, BUMDes differs from conventional economic entities, ensuring its presence and operations significantly contribute to enhancing village welfare. The management strategies of BUMDes in empowering community economies involve planning, organizing, actuating, and controlling activities (Iryani & Mauliza, 2020).

1. Planning

Before starting community economic empowerment activities, the first step taken by the Village-Owned Enterprises (BUMDes) Ngambon in Pakkanna village lays the foundation to initiate activities aimed at achieving their intended goals. Planning conducted by BUMDes carefully considers the knowledge and skills of its managers, ensuring clear establishment of goals and objectives (Fatimah, 2021). The initial phase involves determining the programs or business units to be managed, with a focus on assessing the business prospects of these units that will have the most impact on the economic development of the community. The business units established by BUMDes Ngambon are tailored to the human and natural resource potential of the communities supported by BUMDes. Currently, the BUMDes programs consist of managing village markets, trading agricultural products, and marketing local SME products in the village of Ngambon. While these programs are operational, they have not yet reached their full potential, particularly in terms of funding and addressing stalled business unit funding.

2. Organizing

The organization conducted by BUMDes involves structuring its organizational framework according to goals or available resources to ensure the development of BUMDes (Rahmania & Kriswibowo, 2022). allocation is tailored to the capabilities of each BUMDes official, and their placement in the BUMDes management structure is chosen and established through village deliberations (Kennedy & Kusuma, 2024). BUMDes officials selected through these village deliberations possess knowledge about their respective roles and responsibilities (Wowor et al., 2019).

However, some officials may struggle to fulfill their duties effectively due to external commitments that consume their time outside of BUMDes management. The selected officials have the authority to protect village enterprises from factors that could jeopardize the sustainability of the BUMDes Ngambon, collaborating with the village government and local community to ensure the smooth operation of business units and address any issues within BUMDes. The roles and responsibilities of BUMDes officials are outlined in the organization's Articles of Association (AD/RT). Officials are required to report their work results through accountability reports presented to superiors during village deliberations.

3. Actuating

Actuating is an action taken to ensure that all BUMDes officials work to the best of their ability to achieve the predetermined goals as agreed in the prior planning (Sahara & Choiriyah, 2024). By actuating all BUMDes officials to work diligently according to their respective roles and functions, optimal results can be achieved even during challenging times such as the COVID-19 pandemic. Enhancing the skills of BUMDes officials is crucial so that they can understand and fulfill their duties based on BUMDes regulations. This can be achieved through guidance, education, and training aimed at boosting the morale of the officials (Tohawi et al., 2023)

Educational initiatives and training are essential for improving the managerial capabilities of BUMDes officials in effectively and efficiently managing BUMDes operations (Muhtada et al., 2018). Additionally, guidance in the form of motivation from superiors or peer-to-peer encouragement among officials is provided as needed. This guidance is crucial for addressing any challenges that may arise in BUMDes management, ensuring that suggestions and feedback are constructive and objective in resolving issues effectively.

4. Controlling

The supervision process at BUMDes Ngambon is conducted every 6 months by supervisors appointed by the management to monitor the implementation of activities in the business units. This supervision aims to ensure whether the organization's operations are in line with the plan or not, so that improvements can be made accordingly (Nursalam

et al., 2023). Remedial actions involve analyzing the causes of deviations or problems that occur. Several issues identified and needing immediate follow-up relate to the decline in income from business units during the COVID-19 pandemic, which has caused some units to not operate as expected.

CONCLUSION

Based on the research findings, it can be concluded that BUMDes Restu Ibu in Ngambon Village has not yet effectively involved community participation in advancing the business units managed by BUMDes. There is a lack of socialization regarding BUMDes business units, and the institutional management is still not functioning well. The management strategy to enhance the development of business units includes Planning, Organizing BUMDes, Mobilizing, and Supervising BUMDes operations and its business units according to procedures aimed at maximizing the management of these units. However, some administrators often do not comply with procedures in performing their duties, and there is a lack of involvement from both the village government and the community in supervising BUMDes.

Therefore, it is recommended that BUMDes encourage its members to work harder to achieve their goals effectively. In the supervision process, administrators should evaluate and correct the work that has been carried out to ensure that the implementation aligns with the initial plans. Additionally, optimizing the role of qualified human resources is necessary to enhance the quality of BUMDes towards a more professional direction, making BUMDes a productive, creative, innovative, adaptive, and accountable business entity. The Ngambon Village Government, through BUMDes Restu Ibu, can empower the community through micro-based MSMEs effectively, and also provide pathways or facilities for residents to market their products.

REFERENCES

- Ababil, A. A., & Yulistiyono, H. (2022). Peran BUMDes dalam mengelola desa wisata bukit kehi sebagai pengembangan ekonomi masyarakat desa. *Jurnal Ilmiah Aset*, 24(2), 97–112. <https://doi.org/10.37470/1.24.2.204>
- Agunggunanto, E. Y., Arianti, F., Kushartono, E. W., & Darwanto. (2016). Pengembangan desa mandiri melalui pengelolaan badan usaha milik desa (BUMDes). *Jurnal Dinamika Ekonomi & Bisnis*, 13(1), 67–81.
- Arindhawati, A. T., & Utami, E. R. (2020). Dampak keberadaan badan usaha milik desa (BUMDes) terhadap peningkatan kesejahteraan masyarakat (studi pada badan usaha milik desa (BUMDes) di Desa Ponggok, Tlogo, Ceper dan Manjungan Kabupaten Klaten). *Reviu Akuntansi Dan Bisnis Indonesia*, 4(1), 43–55. <https://doi.org/10.18196/rab.040152>
- Butina, M. (2015). A narrative approach to qualitative inquiry. *American Society for Clinical Laboratory Science*, 28(3), 190–196. <https://doi.org/10.29074/ascls.28.3.190>
- Dewi, E., & Pradana, G. W. (2024). Peran badan usaha milik desa (bumdes) hendrosari kecamatan mengganti kabupaten gresik dalam pengembangan pariwisata di desa wisata Lontar Sewu. *Publika*, 395–408. <https://doi.org/10.26740/publika.v12n2.p395-408>
- Fatimah, A. S. (2021). Pengembangan kapasitas pengelolaan badan usaha milik desa (bumdes) di Desa Cilumba Kecamatan Cikatoma Kabupaten Tasikmalaya. *JAK PUBLIK (Jurnal Administrasi & Kebijakan Publik)*, 2(1), 40–62. <http://administrasiku.com/index.php/jakp/article/view/58>
- Fauzul Hanif Noor Athief, Cahyaningrum, L. I., Darlin Rizki, & Afief El Ashfahany. (2023). The synergy of bwm and bumdes as an alternative for improving the welfare of SMEs. *Jurnal Masharif Al-Syariah: Jurnal Ekonomi Dan Perbankan Syariah*, 8(3), 671–683.
- Hakim, L., & Svinarky, I. (2022). Bum desa sebagai kekuatan ekonomi baru (sebuah gagasan untuk desa di Indonesia). *Penerbit Lakeisha, February*, 828. https://www.researchgate.net/profile/Fx-Anjar-Laksono/publication/358468492 BUM_desa_sebagai_kekuatan_ekonomi_baru_sebuah_gagasan_untuk_desa_di_Indonesia/links/6203d41bc83d2b75dffd64b3/BUM-desa-sebagai-kekuatan-ekonomi-baru-sebuah-gagasan-untuk-desa-di-In
- Hawa, S., Sokarina, A., & Suryantara, A. B. (2022). Peran bumdes maria maju untuk mewujudkan kemandirian ekonomi (studi kasus Desa Maria Kecamatan Wawo Kabupaten Bima). *Balance : Jurnal Akuntansi Dan Manajemen*, 1(2), 235–243. <https://doi.org/10.59086/jam.v1i2.123>
- Ikhwan, M., Safi, S., & Yulianti, R. (2021). BUMDes as an alternative resolution to the conflict of marine tourism management in Madura. *Yuridika*, 36(2), 349. <https://doi.org/10.20473/ydk.v36i2.16546>
- Ikhwansyah, I., Afiana, A., Faisal, P., & Trisnamansyah, P. (2020). An empowerment of a village economy: (BUMDES) in Indonesia. *International Journal of Innovation, Creativity and Change*, 12(8), 192–207.
- Iryani, L., & Mauliza, R. (2020). Sistem pengelolaan bumdes dalam pembangunan tambak milik Desa Lhok Euncien Kecamatan Baktiya Barat Kabupaten Aceh Utara. *Jurnal Ilmu Sosial Dan Ilmu Politik Malikussaleh (JSPM)*, 1(2), 207. <https://doi.org/10.29103/jspm.v1i2.3117>
- Kania, I., Anggadwita, G., & Alamanda, D. T. (2021). A new approach to stimulate rural entrepreneurship through village-

- owned enterprises in Indonesia. *Journal of Enterprising Communities*, 15(3), 432–450.
<https://doi.org/10.1108/JEC-07-2020-0137>
- Kennedy, P. S. J., & Vincentius Andi Mintarja Kusuma. (2024). Governance of village-owned enterprises (bum desa) in achieving village resource independence in Bogor District. *Asia Pacific Fraud Journal*, 9(2), 137–163.
<https://doi.org/10.21532/apfjournal.v9i2.320>
- Lazuardiah, E., Balafif, M., & Rahmasari, A. (2020). Peran badan usaha milik desa (bumdes) dalam meningkatkan potensi dan kesejahteraan masyarakat desa (Studi pada BUMDes Sumber Sejahtera, Desa Pujonkidul, Kecamatan Pujon, Kabupaten Malang, Jawa Timur). *Bharanomics*, 1(1), 9–16. <https://doi.org/10.46821/bharanomicss.v1i1.12>
- Lestari, O. A., Herlan, Hasanah, Pabali Musa, Syarifah Ema Rahmaniah, & Marini. (2023). Peran badan usaha milik desa (bumdes) dalam pemberdayaan masyarakat di tikala desa pasti jaya kecamatan samalantan kabupaten bengkayang. *Komunitas*, 14(1), 10–24. <https://doi.org/10.20414/komunitas.v14i1.7169>
- Muhtada, D., Sastroatmodjo, S., & Diniyanto, A. (2018). Penguatan bumdes menuju masyarakat desa yang lebih sejahtera di Kecamatan Mrebet Kabupaten Purbalingga. *Seminar Nasional Kolaborasi Pengabdian Masyarakat*, 1, 439–446.
- Murwadi, T., Rahardjo, D. S., & Hasna. (2017). BUMDes sebagai badan hukum alternatif dalam pengembangan perkoperasian Indonesia. *Jurnal Hukum Kenotariatan Dan Ke-PPAT-An*, 1(1), 1–18. <http://ditpolkom.bappenas>
- Nursalam, N., David R.E.Selan, Laurensius P.Sayrani, Petrus E.de Rozari, Ajis Salim A.Djaha, Yoao A. Soares, & Alfred O.Ena Mau. (2023). Pengembangan kapasitas kelembagaan badan usaha milik desa (BUMDes) Desa Oabikase Kecamatan Insana Barat Kabupaten Timor Tengah Utara (TTU). *Jdistira*, 3(2).
<https://doi.org/10.58794/jdt.v3i2.567>
- Permana, O., Sutono, A., Sumaryadi, Rahtomo, W., & Ristanto, H. (2023). The role of bumdes (village-owned enterprises) in strengthening the tourism village business ecosystem: Sumberbulu tourism village case study. *Archives of Business Research*, 11(4). <https://doi.org/10.14738/abr.114.14348>
- Rahayu, M. J., Mukaromah, H., & Mulyanto, M. (2024). Social capital-based strategy of sustainable village-owned enterprises (BUMDes) development. *International Journal of Social Economics*, 51(3), 297–312.
<https://doi.org/10.1108/IJSE-10-2022-0700>
- Rahmania, S. N., & Kriswibowo, A. (2022). Manajemen badan usaha milik desa (bumdes) kebaron mandiri makmur Desa Kebaron Kecamatan Tulangan Kabupaten Sidoarjo. *Anterior Jurnal*, 21(2), 49–57.
<https://doi.org/10.33084/anterior.v21i2.3241>
- Ranney, M. L., Meisel, Z. F., Choo, E. K., Garro, A. C., Sasson, C., & Morrow Guthrie, K. (2015). Interview-based qualitative research in emergency care part ii: Data collection, analysis and results reporting. *Academic Emergency Medicine*, 22(9), 1103–1112. <https://doi.org/10.1111/acem.12735>
- Ridhowati, & Ratnasih, C. (2024). The role of village-owned enterprises (bumdes) in local economic empowerment: Analysis and Recommendations. *Jurnal Multidisiplin Indonesia*, 3(11), 4480–4489.
<https://doi.org/https://doi.org/10.58344/jmi.v3i11.1945>
- Ridwan, Z. (2015). Urgensi badan usaha milik desa (bumdes) dalam pembangun perekonomian desa. *FIAT JUSTISIA: Jurnal Ilmu Hukum*, 8(3). <https://doi.org/10.25041/fiatjustisia.v8no3.314>
- Sahara, N. I., & Choiriyah, I. U. (2024). Kinara bumDes: Enhancing management strategies for community prosperity. *Indonesian Journal of Public Policy Review*, 25(1), 10–21070. <https://doi.org/10.21070/ijppr.v25i1.1364>
- Sani, K. R., & Syamsuddin, S. (2021). Sinergitas pemerintah desa salohe dan dinas pemberdayaan masyarakat dan desa dalam penyelenggaraan bumdesa di Kabupaten Sinjai. *Al Qisthi Jurnal Sosial Dan Politik*, 11(2), 107–129.
<https://doi.org/10.47030/aq.v11i2.96>
- Sofyani, H., Atmaja, R., & Rezki, S. B. (2019). Success factors of village-owned enterprises (bumdes) performance in indonesia: An exploratory study. *Journal of Accounting and Investment*, 20(2).
<https://doi.org/10.18196/jai.2002116>
- Syahza, A., Savitri, E., Asmit, B., & Meiwanda, G. (2021). Small-scale agricultural product marketing innovation through BUMDes and MSMEs empowerment in coastal areas. *Management Science Letters*, 11(8), 2291–2300.
<https://doi.org/10.5267/j.msl.2021.3.015>
- Tohawi, A., Mas'ut, M., & Novitasari, K. (2023). Kontribusi bumdes “sumber mulyo” dalam pemberdayaan perekonomian masyarakat desa blitaran kecamatan sukumoro kabupaten nganjuk pada perspektif hukum ekonomi Islam. *Jurnal Dinamika Ekonomi Syariah*, 10(2), 157–167. <https://doi.org/10.53429/jdes.v10i2.668>
- Triyo, E., Haryono, & Irwantoro. (2020). Strategi inovasi badan usaha milik desa (BUMDes) dalam meningkatkan potensi dan kesejahteraan ekonomi masyarakat desa (Studi pada BUMDes Mandiri, Desa Morobakung, Kecamatan Manyar, Kabupaten Gresik). *Cakrawala Journal*, 14(2), 172–182. <https://doi.org/10.32781/cakrawala.v14i2.353>
- Tse, A. D., Suprojo, A., & Adiwidjaja, I. (2018). Peran kader posyandu terhadap pembangunan kesehatan masyarakat. *Pusdik SDM Kesehatan*, 1(1), 1–8.
<http://dx.doi.org/10.1016/j.cirp.2016.06.001%0Ahttp://dx.doi.org/10.1016/j.powtec.2016.12.055%0Ahttps://doi.org/10.1016/j.ijfatigue.2019.02.006%0Ahttps://doi.org/10.1016/j.matlet.2019.04.024%0Ahttps://doi.org/10.1016/j.matlet.2019.127252%0Ahttp://dx.doi.org>

- United Nation. (n.d). The 17 goals. Retrieved October 30, 2023, from <https://sdgs.un.org/goals>. Retrieved at 12.12
- Valle, L., Costan, E., Costan, F., General, E., Alcantara, G., Kilat, R. V., Batican, I., Olivar, G. M., & Avila, D. (2022). Community extension MSME's entrepreneurial activities in relation to poverty reduction. *Frontiers in Sociology*, 7. <https://doi.org/10.3389/fsoc.2022.1038006>
- Winarsi, S., Widyantoro, A., & Moechthar, O. (2018). The law principles for village-owned enterprises (bumdes) management in indonesia to improve the village's economy. *JURISPRUDENCE International Journal of Sociological Jurisprudence*, 1(2), 130–136. <https://ejournal.warmadewa.ac.id/index.php/sjj>
- Wowor, M., Singkoh, F., & Waworundeng, W. (2019). Pengelolaan badan usaha milik desa (bumdes) dalam peningkatan pendapatan asli desa kamanga kecamatan tompaso. *Jurnal Ekonomi Dan Keuangan Publik*, (3)(3), 2337–5736.



Excel-based assistance in financial management of micro-enterprises in the catering industry

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-10-17 Revised: 2025-04-06 Accepted: 2025-04-07 Published: 2025-04-07 Keywords Catering services EFA Excel	<i>Micro, Small, and Medium Enterprises (MSMEs) are productive economic activities that can be managed individually or through business entities. One of the micro businesses in the catering services sector in Surabaya is Bunda Tasty. These businesses face challenges in financial management that are not yet systematized. Record-keeping is still done manually using Excel and does not refer to the Accounting Standards for Entities without Significant Public Accountability (SAK-ETAP). The community service team, consisting of lectures from the Faculty of Economics and Business at Hayam Wuruk University (UHW) Perbanas, provides a solution in the form of financial management using the Excel for Accounting (EFA) application. This application is relatively simple and still utilizes Excel worksheets. The method used involves mentoring in the design and implementation of EFA along with its socialization. The mentoring activities, including the socialization of EFA, were conducted from March to August 2023. The community service activities consist of three main stages: preparation, implementation, and evaluation. A series of community service programs took place over approximately six months. Based on the evaluation, the activities were very successful and provided new knowledge for the partners. The partners can make decisions through systematized financial management. They have also implemented EFA in managing their business since September 2023.</i>
Kata Kunci EFA Excel Jasa Boga	Pendampingan pengelolaan keuangan usaha mikro jasa boga berbasis excel. Usaha Mikro, Kecil, Menengah (UMKM) merupakan usaha ekonomi produktif yang dapat dikelola secara individu maupun melalui badan usaha. Salah satu usaha mikro bidang jasa boga catering di Surabaya adalah Bunda Tasty. Usaha tersebut menghadapi permasalahan pengelolaan keuangan yang belum tersistem. Pencatatan masih dicatat manual pada excel dan belum mengacu pada Standar Akuntansi Keuangan untuk Entitas Tanpa Akuntabilitas Publik (SAK-ETAP). Tim pengabdian kepada masyarakat yang adalah dosen-dosen Fakultas Ekonomi dan Bisnis Universitas Hayam Wuruk (UHW) Perbanas memberikan solusi berupa pengelolaan keuangan dengan aplikasi <i>Excel for Accounting</i> (EFA). Aplikasi tersebut cukup sederhana dan masih memanfaatkan kertas kerja excel. Metode yang digunakan adalah pendampingan terhadap rancang bangun EFA beserta sosialisasinya. Kegiatan pendampingan sampai dengan sosialisasi EFA dilakukan sejak Maret-Agustus 2023. Kegiatan pengabdian kepada masyarakat meliputi tiga tahapan utama yaitu persiapan, pelaksanaan dan evaluasi. Serangkaian program pengabdian kepada masyarakat berlangsung selama kurang lebih enam bulan. Berdasarkan evaluasi kegiatan tersebut berlangsung sangat baik dan memberikan pengetahuan yang baru bagi mitra. Mitra dapat melakukan pengambilan keputusan melalui pengelolaan keuangan yang tersistem. Mitra juga telah mengimplementasikan EFA pada pengelolaan usahanya sejak September 2023.

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INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a pivotal role in Indonesia's economy. They constitute a significant component of the real sector, capable of absorbing a considerable workforce and exerting a notable influence on the national economic condition (Al Humaira et al., 2024). The term MSME refers to Law No. 20 of 2008, which defines productive economic activities that can be operated individually or through business entities, categorized based on business volume and capital (Usaha Mikro, 2008). Based on this definition, the establishment of MSMEs can be done individually, not only by subsidiaries of a business entity (Damayanti & Rompis, 2021), with business fields that may include trade, mining, industry, educational services, property, and others (Siagian & Indra, 2019). The criteria for MSMEs based on capital and business volume or turnover are detailed in Government Regulation No. 7 of 2021. A micro enterprise is defined as having capital of up to one billion Rupiah, excluding the land and buildings used for business, with an annual turnover of up to two billion Rupiah. Small enterprises are defined as having capital between one billion and five billion Rupiah, with an annual turnover between two billion and maximum of 15 billion Rupiah. Medium enterprises have capital ownership of more than five billion Rupiah and up to 10 billion Rupiah, with annual turnover of 15-50 billion Rupiah (PP RI No. 7, 2021). These various characteristics form the basis for identifying the categories of MSMEs.

Identifying the characteristics of MSMEs is crucial as they play a significant role in the growth of Indonesia's economy, evidenced by their number, which accounts for 99 percent of all business units. In 2023, there were approximately 66 million MSME actors, contributing 61 percent to Indonesia's Gross Domestic Product (GDP), equivalent to Rp 9,580 trillion. A total of 117 million workers, or 97 percent of the total workforce, have been absorbed by MSMEs (Kadin, 2024). In its development, Indonesia MSMEs face various challenges, including those related to legality, human resources, innovation, funding, marketing, and technology. The Indonesian Chamber of Commerce (Kadin), along with the government, is striving to enhance the performance of MSMEs nationally through the implementation of digitalization to improve competitiveness and export orientation. The number of MSMEs in Indonesia that have adopted digital management has increased from seven million business units in 2020 to 20.76 million units in 2022. In 2023, it is expected to reach 24 million units and 30 million units by 2024 (Kadin, 2024).

In relation to the achievement of digital strategies among various MSMEs in Indonesia, one province with significant potential is East Java. This province has the highest number of districts and cities in Indonesia, administratively divided into 28 districts and nine cities, with Surabaya as its capital (Kominfo Jawa Timur, 2024). The Surabaya city government is also aware of the potential of MSMEs for the year 2024, there are 643,529 MSMEs in the city of Surabaya (Kementerian Koperasi dan UKM, 2024). The Surabaya city government is also aware of the potential of MSMEs and is working to support national strategic plans through the UMKM Go Digital program. The Surabaya city government launched the Pemberdayaan Ekonomi dan Ketahanan Ekonomi Nang Suroboyo (E-Peken) application. However, in reality, only 3,360 MSMEs have been managed digitally (Fernanda et al., 2024), indicating that there is still a need for improved digital management of MSMEs, particularly in the city of Surabaya.

One of the segments of the MSME sector that has experienced rapid growth is the food business, as it is a primary necessity and offers promising opportunities (Calvin et al., 2023; Manggala Putri et al., 2021). One promising type of food business is catering. This business operates on customer orders, eliminating concerns about unsold food or beverages, but it relies heavily on quality (Prastiwi et al., 2022). Catering services fall under the culinary service sector, providing food and beverages for various events or special occasions, thus encompassing both goods and services. The raw materials processed into food are considered goods for sale, while the service of presenting them is regarded as a service (Sujarwadi et al., 2019). Catering businesses can be categorized as manufacturing enterprises that transform raw materials into finished products. Generally, catering services face challenges in marketing aspects (Irwandi et al., 2024; Sihotang et al., 2024; Sujarwadi et al., 2019) as well as financial aspects (Al Humaira et al., 2024; Prihastuti et al., 2022). Both aspects must also be supported by the Human Resources (HR) aspects in their development and implementation.

Bunda Tasty Catering is a catering business located in Surabaya, established in 2008. The business is situated at Penjaringan Asri XVIII PS IF No. 22, Surabaya. It began as a cooking hobby and has evolved into a family business, currently managed by the second generation of the owners with 10 employees (Sihotang et al., 2024). The term "tasty" is derived from the word "taste," which signifies flavor; thus, their dishes excel in taste and are made from fresh ingredients. The business is still managed conventionally, with order acceptance via telephone or *whatsapp* applications, limited to a maximum of three days before the event (Sihotang et al., 2024), and all administrative tasks are performed by a single vocational school graduate, including financial management.

The achievement of annual revenue, which has not yet reached its maximum potential post-Covid-19 pandemic, is partly due to non-standardized financial management and human resource aspects. Financial management has not adhered to the Accounting for Entities without Significant Public Accountability (SAK-ETAP) and is still conducted manually with the assistance of *Microsoft Excel*. However, partners continue to face difficulties in preparing financial reports related to profit acquisition, cash flow, and financial position for each period. This situation serves as a basis for conducting community service activities due to the identified need and wants for a systematic approach for financial management. The lack of a systematic financial management framework also poses challenges for business development and makes it difficult to gain access to banking service (Manggala Putri et al., 2021). The solution proposed by the community service

team is to design and implement *Excel for Accounting (EFA)*, as the business has necessary infrastructure, including laptops and one administrative staff member capable of operating *Microsoft Office* software, particularly *Excel* (Wulanditya & Aprillianita, 2018). Another reason for implementing EFA in Bunda Tasty is its affordability, ease of use, and accuracy (Novita & Wulanditya, 2020). It is anticipated that implementation of EFA will enhance revenue and the entity's value (Ardianto et al., 2019; Fauzi, 2020; Jusoh & Ahmad, 2019). Some of these studies have focused on the implementation of EFA. However, there have been limited studies concerning the application of EFA in catering service. Therefore, this study intends to implement EFA in catering service. The objective of this study is to provide financial management assistance for Bunda Tasty catering services based on EFA.

METHOD

The community service activities at Bunda Tasty's catering service employ the Participatory Action Research (PAR) method, with the primary activity focusing on the assistance in developing EFA (Putri et al., 2024). The assistance method is carried out in four stages: preparation, implementation, evaluation, and monitoring (Sihotang et al., 2024; Yutanto et al., 2023). The preparation phase begins with coordination between community service's team and the management of Bunda Tasty, followed by an observation of the business conditions to analyze daily recording and financial report preparation activities (Sienatra et al., 2024). The result of the field observation is presented in Figure 1.



Figure 1. Bunda Tasty's Kitchen

Based on interviews with the business owner, Bunda Tasty's revenue before the Covid-19 pandemic was IDR 567 million per year. They even received catering orders for 3,000 guests during the Indonesian Navy's anniversary celebration. During the pandemic, Bunda Tasty attempted to survive by selling daily menus and boxed meals for specific events, resulting in a revenue of IDR 127.2 million per year. The Covid-19 pandemic caused an annual revenue decline of 78 percents. However, post-pandemic, Bunda Tasty has made efforts to increase its revenue, achieving an average of IDR 148.8 million per year, representing a 17 percents increase by the end of 2022. A detailed breakdown of revenue is presented in Table 1.

Table. 1 Annual Revenue Acquisition

Situation	Annual Revenue Acquisition	Revenue Growth Percentage
Before the Covid-19 Pandemic	IDR 567,000,000	0.00%
During the Covid-19 Pandemic	IDR 127,200,000	(78.00%)
Post-Covid-19 Pandemic (up to Dec'2022)	IDR 148,800,000	17.00%

Source: Bunda Tasty, Data Processed

The implementation phase of the community service activities is carried out through assistance that begins with the provision of basic accounting materials and the fundamentals of financial report preparation, followed by the development of EFA application (Sienatra et al., 2024). The process of creating the EFA application involves designing a financial account code (Rahayu et al., 2022) and re-listing the inventory. The next step includes compiling a series of transaction records, concluding with the socialization of the EFA application to the management and administrative staff. The financial report data prepared by the partners consists of records of income and expenditure transactions, accompanied by transaction evidence for the period of January to December 2022. The financial management assistance activities took place from early March to the end of July 2023. The assistance in developing the EFA was also supported by two students from the accounting diploma program at UHW Perbanas.

During the series of community service activities, periodic and continuous evaluations were also conducted. The purpose of these evaluations was to assess the success of financial assistance implementation through the EFA application (Prihastuti et al., 2022), including the challenges still faced by the partners, particularly regarding the operation of the application. Evaluations were conducted in two stages: directly through observation and indirectly through a survey using a questionnaire with a five-point *Likert* scale. This assessment measured the overall implementation of the community service activities and the involvement of the resource persons. The final stage of the community service activities was monitoring the implementation of the EFA application in the financial management of Bunda Tasty. A series of community service activities is presented in Figure 2.

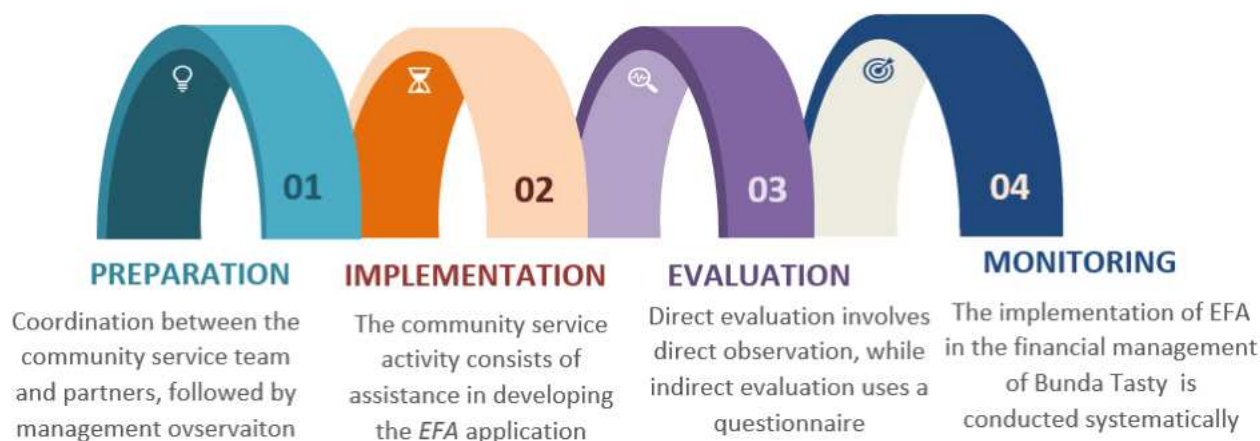


Figure 2. Stages of Community Service Activities

RESULTS AND DISCUSSION

Preparation Stage

The results of this community service activity are based on a series of stages established by the team. In the initial stage, the community service team coordinated with the partners on January 25, 2023. This initial coordination yielded information regarding the partners' needs and wants related to financial management. The financial records only documented income and expenditures using *Excel*; however, the working papers for recording were not interconnected with other worksheets. Several asset components were not recorded, particularly concerning fixed assets. Further observations by the community service team regarding transaction evidence on February 3, 2023, revealed expenditures of a personal nature. This indicates that the partners had not separated their personal financial management from that of the business entity, as personal expenses were still covered by business income. On February 22, 2023, the community service team conducted an online coordination meeting via *Zoom*. This meeting aimed to design solutions for the partners related to financial management. On March 6, 2023, the community service team visited the partners again to propose a solution: the development of the *EFA application*. The partners agreed and provided access to data on income and expenditures for the period from 2022 to March 2023. The income data consisted of a recap of menu orders, while the expenditure data included purchase receipts, as shown in Figure 3.

REKAP MENU PESANAN 2022

No	No Invoice	Tanggal	Pesanan	Jumlah Total
1	0001	2023-01-25	10 Paket Menu Baku 1 @ 250.000	2.500.000
2	0002	2023-01-25	10 Paket Menu Baku 2 @ 250.000	2.500.000
3	0003	2023-01-25	10 Paket Menu Baku 3 @ 250.000	2.500.000
4	0004	2023-01-25	10 Paket Menu Baku 4 @ 250.000	2.500.000
5	0005	2023-01-25	10 Paket Menu Baku 5 @ 250.000	2.500.000
6	0006	2023-01-25	10 Paket Menu Baku 6 @ 250.000	2.500.000
7	0007	2023-01-25	10 Paket Menu Baku 7 @ 250.000	2.500.000
8	0008	2023-01-25	10 Paket Menu Baku 8 @ 250.000	2.500.000
9	0009	2023-01-25	10 Paket Menu Baku 9 @ 250.000	2.500.000
10	0010	2023-01-25	10 Paket Menu Baku 10 @ 250.000	2.500.000
11	0011	2023-01-25	10 Paket Menu Baku 11 @ 250.000	2.500.000
12	0012	2023-01-25	10 Paket Menu Baku 12 @ 250.000	2.500.000
13	0013	2023-01-25	10 Paket Menu Baku 13 @ 250.000	2.500.000
14	0014	2023-01-25	10 Paket Menu Baku 14 @ 250.000	2.500.000
15	0015	2023-01-25	10 Paket Menu Baku 15 @ 250.000	2.500.000
16	0016	2023-01-25	10 Paket Menu Baku 16 @ 250.000	2.500.000
17	0017	2023-01-25	10 Paket Menu Baku 17 @ 250.000	2.500.000
18	0018	2023-01-25	10 Paket Menu Baku 18 @ 250.000	2.500.000
19	0019	2023-01-25	10 Paket Menu Baku 19 @ 250.000	2.500.000
20	0020	2023-01-25	10 Paket Menu Baku 20 @ 250.000	2.500.000
21	0021	2023-01-25	10 Paket Menu Baku 21 @ 250.000	2.500.000
22	0022	2023-01-25	10 Paket Menu Baku 22 @ 250.000	2.500.000
23	0023	2023-01-25	10 Paket Menu Baku 23 @ 250.000	2.500.000
24	0024	2023-01-25	10 Paket Menu Baku 24 @ 250.000	2.500.000
25	0025	2023-01-25	10 Paket Menu Baku 25 @ 250.000	2.500.000
26	0026	2023-01-25	10 Paket Menu Baku 26 @ 250.000	2.500.000
27	0027	2023-01-25	10 Paket Menu Baku 27 @ 250.000	2.500.000
28	0028	2023-01-25	10 Paket Menu Baku 28 @ 250.000	2.500.000
29	0029	2023-01-25	10 Paket Menu Baku 29 @ 250.000	2.500.000
30	0030	2023-01-25	10 Paket Menu Baku 30 @ 250.000	2.500.000

3. NOTA BELANJA BULAN MARET 2023

Tanggal	No	Alamat/Name Toko	Nama Barang	Deskripsi	Harga Satuan	Sub total	Jumlah
2023-03-01	1	Indomaret	Terangin 400 ml	2	15.000	30.000	30.000
2023-03-01	2	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	3	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	4	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	5	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	6	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	7	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	8	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	9	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	10	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	11	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	12	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	13	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	14	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	15	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	16	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	17	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	18	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	19	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	20	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	21	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	22	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	23	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	24	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	25	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	26	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	27	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	28	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	29	Indomaret	Indomie 100g	2	15.000	30.000	30.000
2023-03-01	30	Indomaret	Indomie 100g	2	15.000	30.000	30.000

Figure 3. Income & Expenditure Data

Implementation Stage

The assistance in the development of the *EFA* application began in March 2023. Based on the financial data obtained, the community service team determined that Bunda Tasty's catering services fall under the category of manufacturing enterprises. Although raw materials are processed directly without storage, there is still a processing of basic materials involved. The community service team, assisted by two students, prepared the Chart of Accounts (COA) to obtain a clear overview of the accounts categories relevant to manufacturing enterprises (Rodahayani & Epi, 2023). The results of the COA preparation are presented in Figure 4.

Kode GL	Nama GL	Kelompok	Kode GL	Nama GL	Kelompok
1000	Aset	Aset	4000	Penjualan	Penjualan
1100	Aset Lancar	Aset Lancar	4100	Penjualan Katering	Penjualan Katering
1110	Kas	Kas	4110	Tasty Prasmanan	Penjualan Katering
1120	Piutang	Piutang	4110.01	Tasty 1	Penjualan Katering
1130	Bahan Baku	Bahan Baku	4110.02	Tasty 2	Penjualan Katering
1130	Persediaan	Persediaan	4110.03	Tasty 3	Penjualan Katering
1131	Persediaan Kemasan	Persediaan	4110.04	Tasty 4	Penjualan Katering
1132	Persediaan Barang Habis Pakai	Persediaan	4120	Tasty Tradisional (Prasmanan)	Penjualan Katering
1200	Aset Tidak Lancar	Aset Tidak Lancar	4120.01	Tasty Tradisional 1	Penjualan Katering
1210	Tanah	Tanah	4120.02	Tasty Tradisional 2	Penjualan Katering
1220	Bangunan	Bangunan	4120.03	Tasty Tradisional 3	Penjualan Katering
1220	Kendaraan	Kendaraan	4130	Tasty Box	Penjualan Katering
1230	Inventaris Dapur	Inventaris	4130.01	Tasty Box 1	Penjualan Katering
1240	Inventaris Kantor	Inventaris	4130.02	Tasty Box 2	Penjualan Katering
1250	Akumulasi Penyusutan	Akumulasi Penyusutan	4130.03	Tasty Box 3	Penjualan Katering
1250.01	Akumulasi Penyusutan - Bangunan	Akumulasi Penyusutan	4130.04	Tasty Box 4	Penjualan Katering
1250.02	Akumulasi Penyusutan - Kendaraan	Akumulasi Penyusutan	4130.05	Tasty Nasi Kuning	Penjualan Katering
1250.03	Akumulasi Penyusutan - Inventaris Dapur	Akumulasi Penyusutan	4130.06	Tasty Nasi Gudeg	Penjualan Katering
1250.03	Akumulasi Penyusutan - Inventaris Kantor	Akumulasi Penyusutan	4130.07	Tasty Nasi Uduk	Penjualan Katering
2000	Liabilitas	Liabilitas	4130.08	Tasty Nasi Urap-urap	Penjualan Katering
2100	Liabilitas Lancar	Liabilitas Lancar	4130.09	Tasty Nasi Krawu	Penjualan Katering
2110	Utang Usaha	Liabilitas Lancar	4130.1	Tasty Nasi Rames	Penjualan Katering
2120	Utang Aset	Liabilitas Lancar	4130.11	Tasty Cap Gomeh	Penjualan Katering
2200	Liabilitas Tidak Lancar	Liabilitas Tidak Lancar	4130.12	Tasty Nasi Semarang	Penjualan Katering
3000	Ekuitas	Ekuitas	4130.13	Tasty Nasi Suroboyoan	Penjualan Katering
3100	Modal Pemilik	Modal	4130.14	Tasty Nasi Padang	Penjualan Katering
3200	Prive	Prive	4130.15	Tasty Snack Box 1	Penjualan Katering
3300	Laba Ditahan		4130.16	Tasty Snack Box 2	Penjualan Katering
	Kode GL	Nama GL		Kelompok	
	5000	Beban		Beban	
	5100	Beban Operasional		Beban Operasional	
	5110	Beban Pemasok Makanan		Beban Operasional	
	5120	Beban Penggilingan		Beban Operasional	
	5130	Beban Bahan Habis Pakai		Beban Operasional	
	5140	Beban Pengiriman (Ojek Online, E-tot)		Beban Pengiriman	
	5140.01	Beban Bahan Bakar (Bensin, Parkir)		Beban Pengiriman	
	5150	Beban Pemeliharaan dan Perawatan		Beban Pemeliharaan dan Perawatan	
	5150.01	Beban Pemeliharaan dan Perawatan - Bangunan		Beban Pemeliharaan dan Perawatan	
	5150.02	Beban Pemeliharaan dan Perawatan - Kendaraan		Beban Pemeliharaan dan Perawatan	
	5150.03	Beban Pemeliharaan dan Perawatan - Inventaris Dapur		Beban Pemeliharaan dan Perawatan	
	5150.04	Beban Pemeliharaan dan Perawatan - Inventaris Kantor		Beban Pemeliharaan dan Perawatan	
	5160	Beban Utilitas		Beban Utilitas	
	5160.01	Beban Air		Beban Utilitas	
	5160.02	Beban Listrik		Beban Utilitas	
	5160.03	Beban Telepon		Beban Utilitas	
	5160.04	Beban PGN		Beban Utilitas	
	5160.05	Beban Internet		Beban Utilitas	
	5170	Beban Kebersihan		Beban Kebersihan	
	5170.01	Beban Laundry		Beban Kebersihan	
	5170.02	Beban Sampah		Beban Kebersihan	
	5180	Beban Sewa		Beban Sewa	
	5180.01	Beban Sewa Dekorasi		Beban Sewa	
	5180.02	Beban Sewa Peralatan Catering		Beban Sewa	
	5190	Beban Gaji		Beban Gaji	
	5190.01	Beban Gaji Karyawan Tetap		Beban Gaji	
	5190.02	Beban Gaji Lembur		Beban Gaji	

Figure 4. List of COA

The next step for the community service team, together with two students, was to create a list of fix assets and their depreciation (Rodahayani & Epi, 2023). The depreciation method used is the straight-line method, calculated by dividing the acquisition cost by the useful life without considering a residual value (Kieso et al., 2020). The list of fixed assets is presented in Figure 5.

The community service team subsequently prepared an *Excel* workbook consisting of 12 sheets, including daily records, inventory, cost of goods sold, overhead cost allocation and recap, general journal, initial balances, and financial report worksheets encompassing branch income statements, monthly profit/loss statements, profit/loss statements, and balance sheets that are interconnected, complete with operational instructions for *EFA* (Liana et al., 2022; Novita & Wulanditya, 2020). The *EFA* application was completed on June 5, 2023, along with its user instructions through to the financial report preparation worksheets. Several menus or worksheets in the *EFA* design include a user guide sheet, Balance Sheet (BS), Profit and Loss Statement, branch Profit and Loss Statement, ledger, initial balance, general journal, allocation, expenses, inventory, and daily records (Liana et al., 2022). The *excel*-based financial reports were designed as simply as possible to align with the understanding and transaction needs of the partner business (Widyastuti & Mawardi, 2024). The *EFA* design results for Bunda Tasty are illustrated in Figure 6.

LIST PERALATAN BUNDA TASTY CATERING											
No.	Nama	Qty	Harga	Total	Kategori						
1	Kompor	6	Rp690,000	Rp4,140,000	Inventory dapur	41	Galon	16	Rp50,000	Rp800,000	Inventory dapur
2	Oven	1	Rp2,100,000	Rp2,100,000	Inventory dapur	42	Maja makan panjang	5	Rp525,000	Rp2,625,000	Inventory dapur
3	Wajan	15	Rp400,000	Rp6,000,000	Inventory dapur	43	Kursi	15	Rp65,000	Rp975,000	Inventory dapur
4	Panci pengukus	15	Rp210,000	Rp3,150,000	Inventory dapur	44	Container food (tempat makanan jadi) putih-besar	15	Rp400,000	Rp6,000,000	Inventory dapur
5	Spatula set	10	Rp70,000	Rp700,000	Inventory dapur	45	Container food (tempat makanan jadi) warna warna-kecil	8	Rp285,000	Rp2,280,000	Inventory dapur
6	Pisau set	20	Rp47,000	Rp940,000	Inventory dapur	46	Lemari Peralatan-Kayu besar	3	Rp247,500	Rp742,500	Inventory dapur
7	Talenan	10	Rp19,500	Rp195,000	Inventory dapur	47	Lemari Peralatan-Kayu kecil	2	Rp1,670,000	Rp3,340,000	Inventory dapur
8	Food processor	1	Rp1,450,000	Rp1,450,000	Inventory dapur	48	Kalo besar	5	Rp87,500	Rp437,500	Inventory dapur
9	Blender	3	Rp336,000	Rp1,008,000	Inventory dapur	49	Kalo kecil	5	Rp49,700	Rp248,500	Inventory dapur
10	Freezer	2	Rp3,399,000	Rp6,798,000	Inventory dapur	50	Pemanas	5	Rp105,000	Rp525,000	Inventory dapur
11	Wadah sayuran besar	7	Rp120,000	Rp840,000	Inventory dapur	51	Pemanas listrik	5	Rp419,000	Rp2,095,000	Inventory dapur
12	Wadah sayuran kecil	5	Rp43,000	Rp215,000	Inventory dapur	52	Panci 2.5L	5	Rp350,000	Rp1,750,000	Inventory dapur
13	Juicer	1	Rp870,000	Rp870,000	Inventory dapur	53	Pemanas siomay	3	Rp9,186,000	Rp27,588,000	Inventory dapur
14	Microvave	1	Rp999,800	Rp999,800	Inventory dapur	54	Bowl es	3	Rp399,000	Rp1,197,000	Inventory dapur
15	Sendok	150	Rp1,154	Rp173,125	Inventory dapur	55	Bunga hias VIP	1	Rp135,000	Rp135,000	Inventory kantor
16	Garpu	150	Rp1,000	Rp150,000	Inventory dapur	56	Bunga hias	3	Rp33,000	Rp99,000	Inventory kantor
17	Piring	150	Rp2,500	Rp375,000	Inventory dapur	57	Bunga meja	5	Rp99,800	Rp499,000	Inventory kantor
18	Mangkuk	150	Rp7,250	Rp1,087,500	Inventory dapur	58	Praumanan set	1	Rp739,000	Rp739,000	Inventory dapur
19	Tong penjepit	10	Rp35,000	Rp350,000	Inventory dapur	59	Cup Sealer	1	Rp600,000	Rp600,000	Inventory dapur
20	Punch bowl (mangkuk besar)	12	Rp39,800	Rp477,600	Inventory dapur	60	Laptop dell	1	Rp4,850,000	Rp4,850,000	Inventory kantor
21	Sendok soup soures	150	Rp2,750	Rp412,500	Inventory dapur	61	Komputer samsung	1	Rp14,650,000	Rp14,650,000	Inventory kantor
22	Gelas	150	Rp4,458	Rp668,750	Inventory dapur	62	Printer	1	Rp2,950,000	Rp2,950,000	Inventory kantor
23	Cangkir	150	Rp7,467	Rp1,120,000	Inventory dapur	63	Printer ink	1	Rp1,200,000	Rp1,200,000	Inventory kantor
24	Coffee maker	2	Rp444,900	Rp889,800	Inventory dapur	64	Lemari besi	1	Rp2,035,000	Rp2,035,000	Inventory kantor
25	Kulkas	2	Rp4,425,000	Rp8,850,000	Inventory dapur	65	Maja kerja	2	Rp700,000	Rp1,400,000	Inventory kantor
26	Obat air	2	Rp254,000	Rp508,000	Inventory dapur	66	Kursi kerja	3	Rp200,000	Rp600,000	Inventory kantor
27	Serok penggorengan/Tiruan	5	Rp73,900	Rp369,500	Inventory dapur	67	Kipas angin	1	Rp126,999	Rp126,999	Inventory kantor
28	Botol saos	10	Rp5,000	Rp50,000	Inventory dapur	68	Sendok nasi	4	Rp10,900	Rp43,600	Inventory dapur
29	Saringan gorengan bambu	10	Rp5,000	Rp50,000	Inventory dapur	69	Sendok lasak	12	Rp9,500	Rp114,000	Inventory dapur
30	Timbangan	1	Rp75,000	Rp75,000	Inventory dapur	70	Sendok es	3	Rp14,950	Rp44,850	Inventory dapur
31	Termos nasi	12	Rp349,000	Rp4,188,000	Inventory dapur						
32	Gas	8	Rp566,000	Rp4,528,000	Inventory dapur						
33	Elipis	3	Rp178,000	Rp534,000	Inventory dapur						
34	Dandang kecil	15	Rp42,500	Rp637,500	Inventory dapur						
35	Dandang besar	10	Rp350,000	Rp3,500,000	Inventory dapur						
36	Mixer philips	2	Rp419,000	Rp838,000	Inventory dapur						
37	Tempat krupuk besar	6	Rp126,000	Rp756,000	Inventory dapur						
38	Tempat krupuk kecil	3	Rp24,000	Rp72,000	Inventory dapur						
39	Tempat krupuk sedang	3	Rp56,000	Rp168,000	Inventory dapur						
1200	Bangunan		Rp430,000,000		Spd motor operasional :						
1200	Kendaraan		Rp185,450,000		- yamaha levi 2019						
1230	Inventaris Dapur		Rp124,777,525		- honda beat 2020						
1240	Inventaris Kantor		Rp30,393,999		- yamaha waga 2015						
1250	Akumulasi Penyusutan										
250.01	Akumulasi Penyusutan - Bangunan										
250.02	Akumulasi Penyusutan - Kendaraan										
250.03	Akumulasi Penyusutan - Inventaris Dapur										
250.03	Akumulasi Penyusutan - Inventaris Kantor										

Figure 5. List of Fixed Assets & Depreciation Calculation

EFA Bunda Tasty 05.06.23

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100% 123 Libre 10 + B I Z A

D39 Drag kolom yang memiliki nilai formula pada baris sebelumnya

A B C D E F G H I J K L M N O P Q

PETUNJUK PENGGUNAAN EXCEL FOR ACCOUNTING

NoKeterangan

1Software ini terdiri dari beberapa sheet (kertas kerja) dalam pelaporan keuangan perusahaan manufaktur diantaranya:

11. Laporan Posisi Keuangan >> LPK

12. Laporan Laba Rugi Komprehensif >> LR

13. Bonus: Laporan Laba Rugi Bulanan >> LR Bulanan

14. Bonus: Laporan Laba Rugi Cabang >> LR Cabang

15. Buku Besar >> Ledger

16. Saldo Awal

17. Jurnal Umum

18. Rekapitulasi dan Alokasi BOP >> Alokasi

19. Laporan Biaya Produksi >> Costing

110. Kartu Persediaan >> Stock

2Sheet yang berwarna merupakan simbol dalam siklus akuntansi perusahaan manufaktur yang terdiri dari:

2.1 Sheet berwarna biru mewakili pelaporan keuangan

2.2 Sheet tidak berwarna mewakili data master dan input jurnal

2.3 Sheet berwarna hijau mewakili aktivitas biaya produksi atau persediaan pada perusahaan manufaktur

3Tidak ada data yang harus diinput pada sheet yang berwarna, kecuali cell yang berwarna putih

4Setiap sheet (kertas kerja) memiliki formula yang tidak boleh dihapus atau diubah, ditandai dengan warna merah pada setiap cellnya

+ Petunjuk - LPK - LR - LR Bulanan - LR Cabang - Ledger - Saldo Awal - Jurnal Umum - Alokasi - Costing - Stock - Catatan H <

Figure 6. EFA Application Design

The results of the support provided for the EFA design were subsequently socialized to the management of Bunda Tasty, consisting of three individuals and one administrative staff member. The socialization took place on Saturday, August 5, 2023, from 09.00 to 11.00 AM at the Bunda Tasty catering business, located at Jalan Penjaringan Asri XVIII PS IF No. 22, Surabaya. The community service team presented the operation of the EFA, covering everything from data entry to financial reporting, along with various functions including SUM, IF, SUMIF, and SUMTOTAL (Suci et al., 2021). Documentation of the socialization activity is shown in Figure 7.



Figure 7. EFA Socialization

Evaluation Stage

The evaluation phase was conducted to assess the success level of the *EFA* support program and socialization with the partner (Prihastuti et al., 2022). The evaluation was carried out through two stages: direct and indirect assessment. The direct evaluation was conducted continuously during the support and socialization activities. At this stage, the community service team observed the understanding of the administrative staff and management team of Bunda Tasty regarding basic accounting concepts, specifically the Accounting for Entities without Significant Public Accountability (SAK-ETAP), through discussion (Munzir et al., 2024). The results of this monitoring indicated that the partner had developed a good understanding, which positively impacted their ability to operate the features of the *EFA* (Rahayu et al., 2022).

At the end of the support activities, the community service team provided a questionnaire to be filled out by the partner, including the management and all employees (Putri et al., 2024). On average, the partner rated each statement with a score of four (Sihotang et al., 2024). The average rating from the partner regarding the community service activities was 4.8, indicating that they considered the assessment to be very good. The partner gained knowledge related to financial management through the *EFA*. According to monitoring by the community service team, the partner has been implementing the operation of the *EFA* since September 2023. Overall, the community service activities have positively impacted the partner's financial management through a simple and user-friendly accounting information system. The partner recognizes the importance of financial reporting information concerning to decision-making (Nasihin & Faddila, 2021; Widyastuti & Mawardi, 2024).

CONCLUSION

The community service program with the partner MSMEs engaged in catering services is based on the partner's issue of systematic financial management. The solution offered by the UHW Perbanas faculty team during the community service implementation is a simple financial management system based on Accounting for Entities without Significant Public Accountability (SAK-ETAP) by designing the *EFA* application. This application is straightforward yet systematic and tailored to the needs and preferences of the partner. The community service program was conducted using a mentoring method, consisting of preparation, implementation, and evaluation stages. The preparation stage involved coordination between the community service and the partner. The implementation stage included mentoring in the design of the *EFA* and its socialization, which lasted approximately six months. Overall, the evaluation results indicated that the partner benefited from and gained knowledge related to information system-based financial management.

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REFERENCES

- Al Humaira, B., Sari, P. N., Rahmadi, Z. T., Widjanarko, Nurdiana, D., Yulianto, K. I., & Utomo, K. W. (2024). Pendampingan Pembuatan Laporan Keuangan Berbasis Excel di Bunda Tarie Catering. *PuanIndonesia*, 6(1), 404–410.
- Ardianto, D. T., Riyanto, B., Pramana, P. H., & Widiyanti, E. (2019). Development Potential of Catering Business Using Online Marketing in Surakarta Regency. *The 6th Bandung Creative Movement (BCM)*, 6, 1–4. <http://www.berkahcatering.web.id/article/jasa-catering->
- Calvin, T., Syah, T. Y. R., Hamdi, E., & Ruswanti, E. (2023). Aplikasi Rusa (Rumah Sayur) untuk Usaha Katering Kelas Menengah. *Journal of Economics and Business UBS*, 12(3), 2023. <https://jurnal.ubs-usg.ac.id/index.php/joeb/article/view/1583/1223>
- Damayanti, R., & Rompis, A. I. (2021). Penguatan Peran UMKM melalui Pendampingan Pembuatan Laporan Keuangan. *Magistrorum et Scholarium: Jurnal Pengabdian Masyarakat*, 1(3), 379–390. <https://doi.org/10.24246/jms.v1i32021p379-390>
- Fauzi, H. (2020). Pelatihan Manajemen Keuangan Bagi Pelaku UMKM Sebagai Upaya Penguatan UMKM JABAR Juara Naik Kelas. *BERNAS: Jurnal Pengabdian Kepada Masyarakat*, 1(3), 247–255. <https://doi.org/10.31949/jb.v1i3.324>
- Fernanda, F. F., Wardaya, W., & Primandhana, W. P. (2024). Evaluasi Dampak Platform E-Peken dalam Meningkatkan Pendapatan Pelaku Usaha Mikro, Kecil dan Menengah di Kota Surabaya. *COSTING:Journal of Economic,Business and Accounting*, 7(5), 471–480.
- Irwandi, S. A., Samekto, A., Ekaningtias, E., Pujiati, D., Shonhadji, N., & Murdiawati, D. (2024). Program Pengabdian Masyarakat melalui Pelatihan Akuntansi Perbankan Transaksi Front Office pada Siswa SMK di Surabaya. *Jumpa (Jurnal Pengabdian Masyarakat Paguntaka)*, 2(2), 11–19.
- Jusoh, S. N., & Ahmad, H. (2019). Usage Of Microsoft Excel Spreadsheet As Accounting Tools In SME Company. *INWASCON Technology Magazine*, 1, 23–25. <https://doi.org/10.26480/itechmag.01.2019.23.25>
- Kadin. (2024). *UMKM Indonesia*. <https://Kadin.Id/Data-Dan-Statistik/Umkm-Indonesia/>.
- Kementerian Koperasi dan UKM. (2024, September 1). *Data UMKM*. <https://umkm.depkop.go.id/>.
- Kieso, D. E., Weygandt, J. J., & Warfield, T. D. (2020). *Intermediate Accounting IFRS Edition*. John Wiley & Sons, Inc.
- Kominfo Jawa Timur. (2024, September 4). *Profil Jawa Timur*. <https://jatimprov.Go.Id/Profile>.
- Liana, E., Yutanto, H., Tianto, R., & Sihotang, E. T. (2022). Rancang Bangun Penyusunan Laporan Keuangan Berbasis Excel pada PT Raksasa Teknologi Indonesia. *Wahana; Tri Dharma Perguruan Tinggi*, 74(2), 208–221.
- Manggala Putri, S. A., Hayati, S. R., & Sutrisno, S. (2021). Pendampingan UMKM AL-Maidah Catering Jogja: Sertifikasi Halal dan Pengelolaan Keuangan. *Transformatif : Jurnal Pengabdian Masyarakat*, 2(2), 143–160. <https://doi.org/10.22515/tranformatif.v2i2.3843>
- Munzir, M., Zulkifli, Z., Sabaria, S., Wanda, R. F., Way, A., & Marchivanalia, P. O. (2024). Assistance in Preparing Financial Reports for Houses of Worship with ISAK 35 Standards in Sorong. *Journal of Community Service and Empowerment*, 5(1), 147–154. <https://doi.org/10.22219/jcse.v5i1.29601>
- Nasihin, I., & Faddila, S. P. (2021). Pelatihan Penyusunan Sistem Informasi Akuntansi Dan Pelaporan Keuangan. *JMM (Jurnal Masyarakat Mandiri)*, 5(3), 1071–1087. <https://doi.org/https://dx.doi.org/10.31764/jmm.v5i3.5007>
- Novita, S. M., & Wulanditya, P. (2020). Desain Microsoft Excel for Accounting Bagi UMKM (Studi Kasus pada Ls Farm Mojokerto). *Jurnal Riset Terapan Akuntansi*, 4(2), 192–205.
- PP RI No. 7, <https://peraturan.bpk.go.id/Details/161837/pp-no-7-tahun-2021> 1 (2021). <https://peraturan.bpk.go.id/Details/161837/pp-no-7-tahun-2021>
- Prastiwi, E. H., Ridwan, M. S., & Santoso, R. (2022). Pelatihan Media Sosial Marketing UKM Catering Lestari Surabaya. *Jurnal Indonesia Mengabdi*, 1(1), 34–38. <https://doi.org/10.55080/jim.v1i1.14>
- Prihastuti, A. H., Adriyani, A., Ramadhani, S., & Al Sukri, S. (2022). Pemanfaatan Pelaporan Keuangan Digital Bagi Perkumpulan Penyelenggara Jasa Boga Indonesia (PPJI) Pekanbaru Dimasa Pandemi Covid-19. *COMSEP: Jurnal Pengabdian Kepada Masyarakat*, 3(1), 26–32. <https://www.pekanbaru.go.id/>
- Putri, U. M., Khairiyani, K., Kurniyati, K., & Wulandari, C. P. (2024). Assistance in Preparing Financial Reports for Digital-Based MSME Actors in Tungkal Ilir Sub-District. *ABDIMAS:Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, 9(2), 412–422.
- Rahayu, R., Juita, V., Roza, H., Yohana, D., Rahman, A., & Kartika, R. (2022). Penyusunan Laporan Keuangan berbasis Spreadsheet untuk Badan Usaha Milik Nagari (BUMNAG) di Tanah Datar Sumatera Barat. *Jurnal Nusantara Mengabdi*, 1(2), 97–104. <https://doi.org/10.35912/jnm.v1i2.756>
- Rodahayani, & Epi, Y. (2023). Penyusunan Laporan Keuangan Menggunakan Excel For Accounting (EFA) pada UMKM Cafe IG. *Prosiding Seminar Nasional Teknologi Komputer dan Sains*, 1(1), 445–454. <https://prosiding.seminars.id/prosainteks>
- Siagian, O. A., & Indra, N. (2019). Pengetahuan Akuntansi Pelaku Usaha Mikro Kecil dan Menengah (UMKM) Terhadap Laporan Keuangan. *Syntax Literate : Jurnal Ilmiah Indonesia*, 4(12), 17–35.

- Sienatra, K. B., Murniati, & Kumalasari, R. D. (2024). Pendampingan Pembuatan Laporan Keuangan Berbasis Excel Pada UMKM Kecamatan Pakis Malang. *Madaniya*, 5(3), 885. <https://madaniya.biz.id/journals/contents/article/view/851>
- Sihotang, E. T., Aprillia Nita, R., Budiana, K. M., Yutanto, H., & Ekaningtyas, D. (2024). Pendampingan Pemasaran Digital Melalui Pemanfaatan Landing Page sebagai Media Promosi Usaha Katering. *E-Dimas: Jurnal Pengabdian kepada Masyarakat*, 15(2), 238–245. <https://journal.upgris.ac.id/index.php/e-dimas>
- Suci, R. G., Azmi, Z., Marlina, E., Putri, A. A., Rodiah, S., & Azhari, I. P. (2021). Edukasi Akuntansi Dan Peningkatan Efektifitas Pelaporan Keuangan Bumdes Berbasis Excel For Accounting (EFA). *COMSEP: Jurnal Pengabdian Kepada Masyarakat*, 2(1), 72–77. <https://doi.org/10.54951/comsep.v2i1.58>
- Sujarwadi, A., Karim, A. M., & Afnan, A. (2019). Desain Sistem Promosi Usaha Katering (Jasa Boga) Kelompok PKK Desa Sumberadi, Kabupaten Sleman. *Wikrama Parahita : Jurnal Pengabdian Masyarakat*, 3(2), 52–56. <https://doi.org/10.30656/jpmwp.v3i2.1674>
- Usaha Mikro, K. dan M. (2008). *Undang-Undang (UU) Republik Indonesia (RI) No. 20*. Kementerian Koperasi Dan Usaha Kecil Menengah (UKM).
- Widyastuti, A., & Mawardi, F. D. M. (2024). Pendampingan Penyusunan Laporan Keuangan Berbasis Excel dalam Upaya Meningkatkan Kualitas Penyusunan Laporan Keuangan. *Jurnal Pengabdian Dan Peningkatan Mutu Masyarakat (Janayu)*, 5(1), 108–116. <https://doi.org/10.22219/janayu.v5i1.31706>
- Wulanditya, P., & Aprillanita, R. (2018). The Development of Accounting Information System Based on Excel in Helping CV Ladi Collection Preparing Their Financial Statement. *Jurnal Ilmiah Bidang Akuntansi dan Manajemen (JEMA)*, 15(1), 71. <http://riset.unisma.ac.id/index.php/jema>
- Yutanto, H., Suhartono, Sihotang, T. E., Budiana, M. K., & Ekaningtyas, D. (2023). Website as Digital Marketing of Ecotourism Medokan Ayu Mangrove Botanical Gardens in Rungkut District, Surabaya, East Java. *Jurnal Pengabdian Kepada Masyarakat (Indonesian Journal of Community Engagement)*, 9(1), 30–37. <https://doi.org/10.22146/jpkkm.77400>



Socialization of filling in SINTA data: Improving lecturers' research and publication track records

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ARTICLE INFO	ABSTRACT
Article history Received: 2025-01-28 Revised: 2025-04-06 Accepted: 2025-04-07 Published: 2025-04-07 Keywords Data Lecturer Publication SINTA Track record of research	<i>The SINTA (Science and Technology Index) National Indexation System is a platform developed by the Indonesian Ministry of Education, Culture, Research, and Technology to support the management of research data, publications, and community service by lecturers and researchers. However, the lack of understanding regarding how to fill in SINTA data is often an obstacle in improving research and publication track records. This community service activity aims to provide socialization and training to lecturers regarding SINTA data filling following applicable guidelines. The methods used include presentation sessions, simulations, and direct assistance as well as giving pre-test and post-tests to participants. The results of the activity showed that participants experienced an increase in understanding and skills in filling SINTA data by 86%, which had implications for increasing the visibility and academic track record of lecturers. This activity is expected to contribute to improving the quality of research and scientific publications in Indonesia.</i>
Kata kunci Data Dosen Publikasi Rekam Jejak Penelitian SINTA	Sosialisasi pengisian data SINTA: Meningkatkan rekam jejak penelitian dan publikasi dosen. Sistem Indeksasi Nasional SINTA (Science and Technology Index) merupakan platform yang dikembangkan oleh Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Indonesia untuk mendukung pengelolaan data penelitian, publikasi, dan pengabdian masyarakat oleh dosen dan peneliti. Namun, kurangnya pemahaman terkait cara pengisian data SINTA sering menjadi kendala dalam meningkatkan rekam jejak penelitian dan publikasi. Kegiatan pengabdian masyarakat ini bertujuan untuk memberikan sosialisasi dan pelatihan kepada dosen mengenai pengisian data SINTA yang sesuai dengan pedoman yang berlaku. Metode yang digunakan meliputi sesi presentasi, simulasi, dan pendampingan langsung serta pemberian pre-test dan post-test kepada peserta. Hasil kegiatan menunjukkan bahwa partisipan mengalami peningkatan pemahaman dan keterampilan dalam pengisian data SINTA sebesar 86%, yang berimplikasi pada peningkatan visibilitas dan rekam jejak akademik dosen. Kegiatan ini diharapkan dapat berkontribusi dalam meningkatkan kualitas penelitian dan publikasi ilmiah di Indonesia. Copyright © 2025, Hardani et al This is an open-access article under the CC-BY-SA license.

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INTRODUCTION

In the digital era, research and publication data management has become a very important aspect of the academic world (Kraus et al., 2022). Research and publication data not only reflect the academic productivity of a lecturer but also become an important indicator for the assessment of higher education institutions at the national and international levels (Rusilowati & Pratiwi, 2022). In the Indonesian context, one of the government's efforts to facilitate research and publication data management is by developing the Science and Technology Index (SINTA) platform. SINTA is a web-based information system designed to index, analyze, and assess the research, publication, and community service performance of lecturers and academic institutions (Fitria, 2023).

However, the utilization of SINTA has not been fully optimal. One of the main obstacles faced by lecturers is the lack of understanding of how to fill and manage data in SINTA (Syahlan et al., 2023). Many lecturers do not realize the importance of regularly updating their research and publication data, so their academic track record is not maximally visible. In addition, some lecturers face technical difficulties in integrating research data from other platforms, such as Google Scholar, Scopus, or Web of Science, into the SINTA system (Ahmar et al., 2018). These obstacles not only impact individual lecturers but also the institutions they belong to, considering that data in SINTA is often used as material for institutional performance evaluation by the government (Fitria, 2023).

This issue is increasingly relevant to the demand to improve the quality of research in higher education (Gill et al., 2022). The Indonesian government through the Ministry of Education, Culture, Research, and Technology is actively encouraging an increase in the number and quality of scientific publications produced by lecturers. This is in line with efforts to improve the ranking of Indonesian higher education institutions at the global level. However, without an adequate understanding of data management in SINTA, much potential is not optimally utilized. Therefore, appropriate interventions are needed to improve lecturers' literacy regarding SINTA data filling (Agustina et al., 2023).

This community service activity is designed to answer these needs. The socialization on SINTA data filling aims to provide lecturers with a deep understanding of the importance of research and publication data management, as well as providing technical training to improve their skills in using the SINTA platform (Manik et al., 2022). This socialization is expected to overcome various obstacles that have been faced by lecturers, both in terms of conceptual and technical understanding. The implementation of this activity was based on several main reasons. First, there is an urgent need to increase the visibility of lecturer research in Indonesia. With complete and integrated data, lecturers can increase the exposure of their scientific work, both at the national and international levels (Zustiyantoro, 2022). Second, a strong track record in SINTA can have a positive impact on lecturers' careers, for example in terms of applying for functional promotion, receiving research grants, and research collaboration opportunities (Murcahyanto et al., 2022). Third, optimizing the use of SINTA contributes to the overall improvement of the accreditation and reputation of higher education institutions (Rahardja et al., 2019).

This socialization activity is designed to provide a comprehensive approach, covering both theoretical and practical aspects. In the socialization session, participants will be introduced to the importance of data in SINTA, the latest policies relating to research data management, as well as strategies to improve their SINTA score (Ahmar et al., 2018). In addition, the technical training will focus on how to synchronize data from other platforms to SINTA, profile updating techniques, and steps to ensure the completeness of research data (Fitria, 2023).

In its implementation, this activity adopted a participatory method by involving lecturers as the main subject (Tuhkala, 2021). This approach aims to ensure that the socialization activities are not only one-way, but also provide space for participants to share experiences, ask questions, and discuss solutions to the obstacles they face. The evaluation was conducted thoroughly to measure the success of the activity, including the improvement of participants' understanding and technical capabilities in SINTA data management (Eungoo & Hwang, 2023). This activity also aims to have a long-term impact. With the increasing skills of lecturers in SINTA data management, it is expected that they can independently manage their research and publication track records in the future. In addition, the results of this activity can be a reference for the development of similar programs in other higher education institutions (Nassar et al., 2024).

In conclusion, managing research and publication data through SINTA is a crucial aspect of supporting the academic performance of lecturers and higher education institutions. The socialization of SINTA data filling carried out in this activity not only aims to overcome technical obstacles but also to encourage lecturers to be more active in improving their research track records. Thus, this activity is expected to make a significant contribution to efforts to improve the quality of research and publications in Indonesia (SMERU, 2022).

The socialization of SINTA data filling is actually not entirely new, because it has been carried out several times by various institutions, both by universities and higher education service institutions (LLDIKTI). However, these activities still have some weaknesses, such as the delivery of material that is too general, the lack of technical assistance, and the low understanding of lecturers regarding the importance of updating SINTA data on performance assessment and academic career development (Limbong et al., 2022). Therefore, this activity remains relevant and needs to be carried out with a more practical and contextual approach. The main objective of this activity is to improve lecturers' ability to fill and update data in the SINTA system accurately and comprehensively. Thus, the track record of research and publications of lecturers can be well-documented, while reflecting the real academic performance. This activity is expected to make a significant

contribution, both individually for lecturers in terms of career development, and institutionally through improving the quality of SINTA data which also supports the accreditation process and the overall reputation of the university.

METHOD

This socialization activity was held in Hall 2 of Medica Farma Husada Mataram Polytechnic, which is located on Jl. Medica Farma No.1 Lingkungan Batu Ringgit Selatan Sekarbela, Mataram. The targets of the activity were permanent lecturers in the Medica Farma Husada Mataram Polytechnic, with a total of 20 participants involved. To ensure optimal understanding and provide space for direct practice and assistance, this activity was carried out for three days, with details of the first day for the delivery of policy material and introduction to the SINTA system, the second day for the practice of filling and synchronizing data independently, and the third day focused on clinic sessions or individual consultations to resolve technical obstacles faced by participants. This series of activities is designed to be more comprehensive and applicable, so it is hoped that all participants can master the data filling process correctly and completely.

This community service activity is carried out with a participatory approach, which aims to ensure that the participants, namely lecturers, can be actively involved in all stages of the activity. The methods used are designed to provide in-depth understanding, practical skills, and direct support to participants in the data-filling process on the SINTA platform. The following are the steps and methods applied in this activity:

Preparation Stage

In the early stages, the implementation team identified needs and planned activities. Some of the steps taken were:

- a. Requirement analysis
Collect data on the level of understanding and obstacles faced by lecturers in filling out data in SINTA through surveys or short interviews.
- b. Coordination
Organize a meeting with LPPM Politeknik Medica Farma Husada Mataram to determine the time, place, and participants of the activity.
- c. Preparation of materials
The socialization and training materials are designed based on the official SINTA guidelines and the needs of the participants. The materials include an introduction to the SINTA platform, how to synchronize data, profile-filling techniques, and strategies for improving SINTA scores.
- d. Preparation of equipment
Provide supporting devices such as computers, internet connections, and presentation tools to support the smooth running of activities.

Implementation Stage

The socialization and training activities were conducted in several structured sessions, including:

- a. Socialization Session (Theory)
In this session, participants were given an in-depth understanding of the importance of SINTA as a research and publication data management platform. Materials related to government policies related to SINTA utilization for academic performance evaluation. The benefits of filling SINTA data for lecturers, such as improving research track records, supporting promotion, and research collaboration opportunities. This session was delivered through a presentation using interactive slides, followed by a question-and-answer discussion to ensure participants' understanding (Nur et al., 2024).



Figure 1. Interactive slides

b. Technical Training Sessions (Practical)

In this session, participants were trained directly on how to use the SINTA platform. Some of the steps taught include How to create and update profiles in SINTA, Synchronize data from other platforms, such as Google Scholar, Scopus, and Web of Science, and Strategies for improving SINTA scores, such as uploading supporting documents and ensuring completeness of research data. The simulation was conducted directly with assistance from the implementation team. Each participant used their own computer/laptop device to practice the steps taught.

c. Mentoring Session

Assistance was provided intensively to help participants who faced technical problems or needed special guidance. The implementation team assisted participants individually, ensuring that each participant was able to complete the data entry correctly.

Evaluation Stage

After the activity is completed, an evaluation is conducted to measure the effectiveness of the activity. The evaluation covers two main aspects, namely 1) Evaluation of Understanding: Using pre-test and post-test to assess the improvement of participants' understanding of SINTA data filling. 2) Implementation Evaluation: Participants are asked to provide feedback on the implementation of activities, such as the relevance of the material, delivery methods, and perceived benefits. The results of this evaluation are used to assess the success of the activity as well as being an improvement material for similar programs in the future.

Follow-up Stage

To ensure long-term impact, the implementation team provides follow-up consultation and mentoring services for participants. This aims to help participants who may still face obstacles after the activity is over.

The service flowchart is presented in Figure 2.

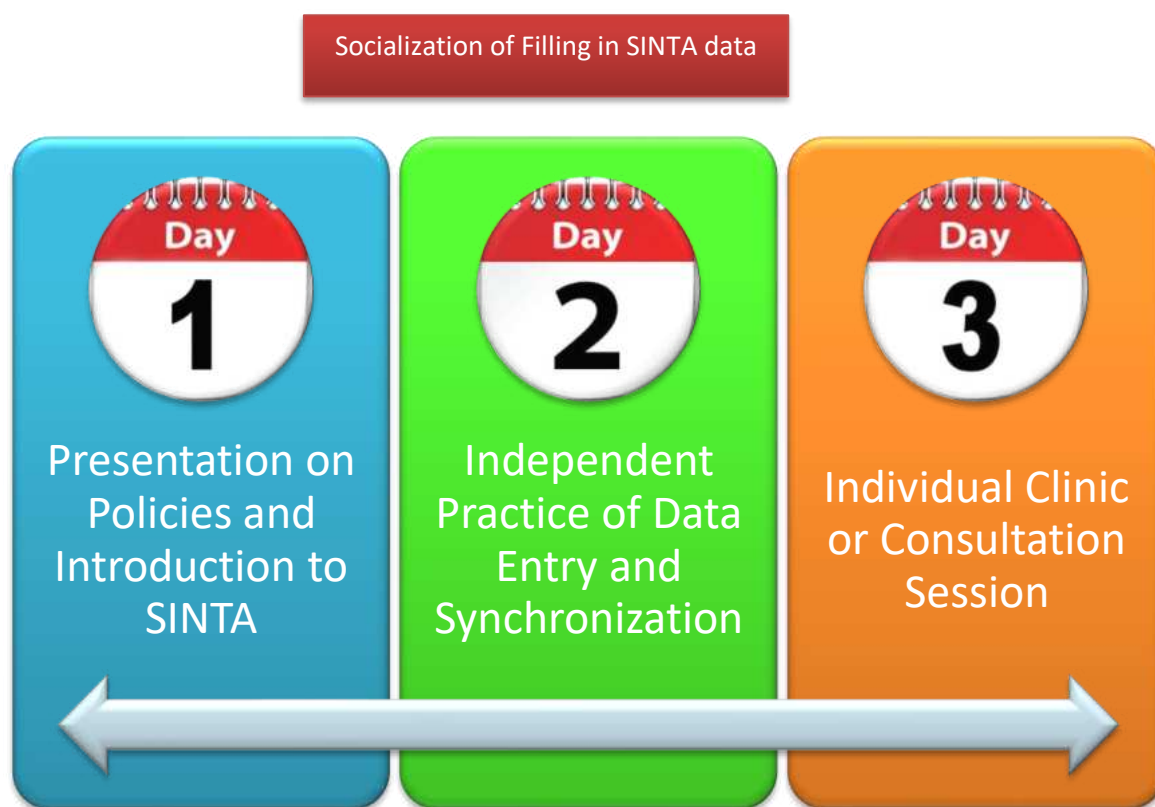


Figure 2. Flowchart

RESULTS AND DISCUSSION

Community service activities that aim to improve the understanding and skills of lecturers in filling data in SINTA have been carried out well. All stages of the activity, starting from socialization, and technical training, to mentoring, were carried out according to plan. The following are the results of each stage of the activity:

Participant Participation Rate

This activity was attended by 20 lecturers at Politeknik Medica Farma Husada Mataram. The attendance rate was very good, reaching 96%, which shows their enthusiasm for the topic of the activity. Before the activity began, the participants were required to take an initial survey to measure their initial level of understanding regarding SINTA. This survey showed that 72% of participants had a low to moderate understanding of SINTA, while the other 28% had a fairly good understanding but faced technical obstacles. This community service activity is carried out in an academic environment to provide knowledge about SINTA to academics, in this case, new lecturers. Given the importance of SINTA in lecturer career development and is one of the benchmarks for the performance of the tri dharma of lecturers. This activity was held on October 21, 2023, at the Politeknik Medica Farma Husada Mataram Hall. The response of the participants in this activity was quite positive and their enthusiasm was stable from the beginning to the end of the activity. The question and answer session that was held was quite intense because many questions were given by the participants to the resource person.

Table 1. Result Pre-test

No	Questions	Answer (%)	
		Yes	No
1	Do you know what SINTA is?	20	80
2	Do you know what SINTA features are?	10	90
3	Do you know what the SINTA features do?	10	90
4	Do you know what the SINTA score is?	0	100
5	Is SINTA important for lecturer career development lecturer's career development?	40	60
6	Does SINTA affect the research and service of lecturers?	30	70
7	Is the SINTA score a requirement for applying for lecturer research grants?	20	80
8	Do you now understand what SINTA is and its benefits for lecturers?	10	90
9	Do you understand the steps to fill in research, publication, or service data in SINTA?	0	100
10	Do you feel more confident in using SINTA after attending this socialization and training?	0	100

Table 2. Result Post-test

No	Questions	Answer (%)	
		Yes	No
1	Do you know what SINTA is?	100	0
2	Do you know what SINTA features are?	100	0
3	Do you know what the SINTA features do?	100	0
4	Do you know what the SINTA score is?	100	0
5	Is SINTA important for lecturer career development lecturer's career development?	100	0
6	Does SINTA affect the research and service of lecturers?	100	0
7	Is the SINTA score a requirement for applying for lecturer research grants?	100	0
8	Do you now understand what SINTA is and its benefits for lecturers?	100	0
9	Do you understand the steps to fill in research, publication, or service data in SINTA?	100	0
10	Do you feel more confident in using SINTA after attending this socialization and training?	100	0

Table 1 shows the pre-test results related to lecturers' understanding of SINTA before attending socialization and training. Basic understanding of SINTA is still low, only 20% of participants know what SINTA is, while 80% do not know it. Most participants (90%) did not know the features of SINTA and its functions. Lack of Understanding about SINTA Score, None of the participants (0%) knew what SINTA score was, while 100% did not know it. This shows that the information about the SINTA score is still not understood by the participants. Awareness of the Importance of SINTA for Academic Careers, 40% of participants realized that SINTA is important for lecturer career development, but there are still 60% who do not understand its relevance. Only 30% understand that SINTA affects lecturers' research and community service, while 70% do not know yet. As many as 20% of participants knew that the SINTA score was a requirement in applying for research and community service grants, but the majority (80%) did not know about it. Lack of Technical Understanding of the Use of SINTA, after the pre-test, only 10% of participants understood what SINTA was and its benefits for lecturers. 100% of participants did not understand the steps to fill in research, publication, or community service data in SINTA. No participants (0%) felt confident in using SINTA after this pre-test. Most participants had a very low understanding of SINTA, including its features, benefits, and use in the academic world. Participants did not know how to fill in research data and

improve SINTA scores. Socialization and training are needed to increase participants' awareness and skills in using SINTA optimally (Zen et al., 2023).

Table 2 of the post-test results shows the evaluation results after the participants attended the socialization and training on SINTA. Overall Improvement in Understanding, 100% of participants now know what SINTA is, its features, and how to use it. Previously, only 20% of participants knew about SINTA, and the understanding of its features and benefits was very low. This shows that the socialization successfully increased participants' overall awareness and understanding. Understanding of SINTA Score, Before the training, 100% of participants did not know what the SINTA score was. After the training, 100% of participants already understood the concept of the SINTA score and its role in an academic career. This shows that the training provided clear and easy-to-understand information. Awareness of the Importance of SINTA for Academic Career, All participants now realize that SINTA is important for lecturers' career development (100%), compared to only 40% previously. 100% of participants also understand that SINTA affects research and community service, compared to only 30% previously. Previously, only 20% of participants knew that a SINTA score was required for research grant applications. After the training, 100% of participants now know it. Technical Skills Improvement in Using SINTA, 100% of participants now understand the steps of filling in research, publication, and community service data in SINTA. Previously, 100% of participants did not understand how to fill in the data. This shows that the training succeeded in providing a practical understanding of the use of SINTA. Increased Confidence in Using SINTA, Previously, no participants (0%) felt confident in using SINTA. After the training, 100% of participants felt more confident in using SINTA to support their academic track record.

SINTA socialization and training succeeded in significantly improving participants' understanding and skills. All participants now have a good understanding of the concepts, features, benefits, and how to use SINTA. Participants also feel more confident in managing their research data and publications in SINTA. These results show that the socialization method used is very effective in providing education and training related to SINTA. From the results of this socialization and training, it is necessary to provide regular assistance so that participants can continue to update data in SINTA. Further training can be provided to improve strategies for increasing SINTA scores and publications in reputable journals.

Improved Understanding

Participants' understanding was evaluated through pre-tests and post-tests conducted before and after the socialization session. The pre-test results showed an average score of 14%, while the post-test average score increased to 100%. This shows an increase in participants' understanding by 86%. This increase is indicated by the participant's ability to answer questions related to SINTA functions, data-filling procedures, and its benefits for academic track records (Amaliawati et al., 2024).



Figure 3. The socialization session

Technical Competence

In the technical training session, participants were trained to perform several important steps in filling data in SINTA, such as; Creating or updating SINTA profiles, Synchronizing data with Google Scholar and Scopus, and Entering research data that has not been indexed automatically. The results of this session showed that 90% of participants completed their profile filling, while the other 10% still needed further assistance. The main obstacles faced by participants were limited access to old publication data and technical constraints related to integration with other platforms (Faza et al., 2024).

Feedback from Participants

Feedback provided by participants through questionnaires showed that 90% found this activity very useful, especially in providing new understanding and practical solutions for data filling in SINTA. Participants also appreciated the individual mentoring approach that helped resolve the technical issues they faced. However, some participants suggested the need for additional sessions to discuss strategies to improve SINTA scores through publications in reputable journals (Khaerani et al., 2023).

Relevance of Activities to Participants' Needs

The pre-test results show that there are still many lecturers who have limitations in understanding and utilizing SINTA. This is in line with the findings of several previous studies that show that a lack of digital literacy and technical knowledge is a barrier to research data management among academics (Gkrimpizi et al., 2023). Therefore, this activity proved to be relevant in answering the needs of participants to improve lecturers' research track records (Uzorka et al., 2023).

This activity also provided new insights into the importance of structured and integrated data management. With the SINTA platform, lecturers can not only increase the visibility of their research but also simplify administrative processes, such as applying for research grants and academic promotion (Nur et al., 2024).

Impact on Lecturer's Academic Track Record

Although the long-term impact of this activity cannot yet be fully evaluated, the improved understanding and technical skills of participants indicate a potentially significant impact on their academic track record (Çela et al., 2024). With a more complete and integrated profile in SINTA, lecturers can increase their chances of getting recognition for their research at the national and international levels (Fitria, 2023). In addition, this activity provides a solid foundation for participants to independently manage their research data in the future. This is important given that data entry in SINTA requires regular updates to reflect actual research performance (Wibisono & Rahman, 2024).

Challenges and Solutions

Some of the challenges encountered during the activities, such as limited access to old publication data, indicate the need for additional support, both from institutions and the government (Timotheou et al., 2023). As a solution, higher education institutions can provide a support team to assist lecturers in managing their research data. In addition, the government can increase socialization and technical training related to SINTA at the regional level to reach more lecturers (Nur Fitria, 2023). Other technical constraints, such as data integration from other platforms, also require more attention. For example, some participants reported that data from Google Scholar is not automatically indexed in SINTA. To overcome this, it is necessary to improve the quality of the SINTA system to make it more compatible with other indexation platforms (Prasepta & Surbakti, 2025).

Activity Implications

This activity has broad implications, both for lecturers and institutions. For lecturers, a better understanding of SINTA can increase motivation to publish their scientific work (Abdul Rahman, Siti Masitoh, 2022). For institutions, the increase in SINTA scores of lecturers can contribute to the improvement of the institution's accreditation and reputation at the national level (Agustina et al., 2023). In addition, this activity can serve as a model for similar programs in other institutions. The participatory approach, comprehensive materials, and individual mentoring proved effective in improving participants' competencies (Almulla, 2020). With the replication of this program in various institutions, it is expected that the quality of research and publications in Indonesia can increase significantly.

CONCLUSION

The socialization of SINTA data filling has successfully improved lecturers' understanding and skills in managing their research and publication records. Based on the pre-test and post-test results, there was a significant increase in understanding of the concepts, features, and importance of SINTA for academic career development. Before the training, the majority of participants did not understand SINTA and how to use it, but afterward, all participants showed a better understanding and felt more confident in filling and updating their data in SINTA.

The training also emphasized the importance of regular data updates to improve SINTA scores, which affect opportunities to obtain research grants and academic recognition. The success of this program shows that similar socialization needs to be carried out regularly so that lecturers can continue to optimize the use of SINTA to improve the quality of their research and publications at the national and international levels.

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REFERENCES

- Abdul Rahman, Siti Masitoh, A. M. (2022). Collaborative Learning to Improve Creative and Critical Thinking Skills: From Research Design to Data Analysis. *International Journal of Educational Review*, 10(1), 1–52. <https://doi.org/10.21608/pshj.2022.250026>
- Agustina, I., Sinaga, R., Lubis, R., & Putra, S. (2023). One Extraordinary Lecturer One Article Indexed Minimum Sinta 3 Program to Improve Writing and Research Skills of Extraordinary Lecturers. *Journal of Human And Education*, 3(4), 301–306. <https://doi.org/10.1016/j.jbusres.2021.09.029>
- Ahmar, A. S., Kurniasih, N., Irawan, D. E., Sutiksno, D. U., Napitupulu, D., Setiawan, M. I., Simarmata, J., Hidayat, R., Busro, Abdullah, D., Rahim, R., & Abraham, J. (2018). Lecturers' Understanding on Indexing Databases of SINTA, DOAJ, Google Scholar, SCOPUS, and Web of Science: A Study of Indonesians. *Journal of Physics: Conference Series*, 954(January), 012026. <https://doi.org/10.1088/1742-6596/954/1/012026>
- Almulla, M. A. (2020). The Effectiveness of the Project-Based Learning (PBL) Approach as a Way to Engage Students in Learning. *Sage Open*, 10(3). <https://doi.org/10.1177/2158244020938702>
- Amaliawati, S., Aulia, N., & Susanti, A. (2024). A Systematic Investigation of Research Trends of ELT and EFL Found in JEES and JEFL Journals. *Journal of English Teaching, Literature, and Applied Linguistics*, 8(1), 1. <https://doi.org/10.30587/jetlal.v8i1.6751>
- Çela, E., Fonkam, M. M., & Potluri, R. M. (2024). Risks of AI-Assisted Learning on Student Critical Thinking. *International Journal of Risk and Contingency Management*, 12(1), 1–19. <https://doi.org/10.4018/IJRCM.350185>
- Eungoo, K., & Hwang, H.-J. (2023). The Importance of Anonymity and Confidentiality for Conducting Survey Research. *Journal of Research and Publication Ethics*, 4(1), 1–7. <https://doi.org/10.15722/jrpe.4.1.202303.1>
- Faza, A., Santoso, H. B., & Hadi Putra, P. O. (2024). Navigating online learning challenges and opportunities: Insights from small group of lecturers during pandemic. *Procedia Computer Science*, 234, 1164–1174. <https://doi.org/10.1016/j.procs.2024.03.112>
- Fitria, T. N. (2023). Utilization of SINTA (Science and Technology Index) as Web-based Research Information System. *International Journal of Computer and Information System (IJCIS)*, 4(2), 50–62. <https://doi.org/10.29040/ijcis.v4i2.114>
- Gill, S. K., Dhir, A., Singh, G., & Vrontis, D. (2022). Transformative Quality in Higher Education Institutions (HEIs): Conceptualisation, scale development and validation. *Journal of Business Research*, 138(April 2021), 275–286. <https://doi.org/10.1016/j.jbusres.2021.09.029>
- Gkrimpizi, T., Peristeras, V., & Magnisalis, I. (2023). Classification of Barriers to Digital Transformation in Higher Education Institutions: Systematic Literature Review. *Education Sciences*, 13(7). <https://doi.org/10.3390/educsci13070746>
- Khaerani, N. S., Lintangari, A. P., Gayatri, P., & Brawijaya, U. (2023). (Journal of English Education and Linguistics Studies) P-ISSN: 2407-2575 E-ISSN: 2503-2194 <https://jurnalfaktarbiyah.iainkediri.ac.id/index.php/jeels>. *Listening To Students' and Teachers' Voices: Online Teaching Practices Leading To Efl Learners ' Demotivation*, 10(January 2023), 119–148.
- Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management*, 63(August 2020). <https://doi.org/10.1016/j.ijinfomgt.2021.102466>
- Limbong, M., F, F., Harefa, N., & Lumbantoruan, J. H. (2022). Description of Increasing the Number of Research and Publication of Lecturers at the Indonesian Christian University, East Jakarta. *Tadbir : Jurnal Studi Manajemen Pendidikan*, 6(2), 333. <https://doi.org/10.29240/jsmp.v6i2.5374>
- Manik, L. P., Akbar, Z., Yaman, A., & Indrawati, A. (2022). Indonesian Scientists' Behavior Relative to Research Data Governance in Preventing WMD-Applicable Technology Transfer. *Publications*, 10(4), 50. <https://doi.org/10.3390/publications10040050>
- Murcahyanto, H., Mohzana, M., & Fahrurrozi, M. (2022). Work Experience and Achievement: Their Influence on Lecturers' Career. *AL-ISHLAH: Jurnal Pendidikan*, 14(2), 1219–1230. <https://doi.org/10.35445/alishlah.v14i2.2024>
- Nassar, F. S., Abbas, A. O., Al-Saify, H., & Ali, O. M. (2024). The Impact of Extracurricular Activities on Developing Academic Standing, Student Satisfaction, Performance, and Bolstering the Academic Reputation of Higher Education Institutions from the Perspective of SDGs. *Journal of Lifestyle and SDGs Review*, 5(1), e02758. <https://doi.org/10.47172/2965-730X.SDGsReview.v5.n01.pe02758>
- Nur, A. C., Suyuti, M. R., & Arhas, S. H. (2024). *Sinta ' s Development Directions for The Future*. 1247–1253.

- Nur Fitria, T. (2023). Lecturer's Personal Branding in the Digital Era: Building Good Reputation and Positive Image through Social Media. *International Journal of Business, Humanities, Education and Social Sciences (IJBHES)*, 5(2), 76–87. <https://doi.org/10.46923/ijbhес.v5i2.269>
- Prasepta, F., & Surbakti, S. (2025). Opportunities and Challenges of Embedding AI in SINTA : A Systematic Literature Review. *Metris: Jurnal Sains Dan Teknologi*, 25(2024), 115–121.
- Rahardja, U., Harahap, E. P., & Dewi, S. R. (2019). The strategy of enhancing article citation and H-index on SINTA to improve tertiary reputation. *Telkomnika (Telecommunication Computing Electronics and Control)*, 17(2), 683–692. <https://doi.org/10.12928/TELKOMNIKA.V17I2.9761>
- Rusilowati, U., & Pratiwi, A. (2022). LECTURERS' REAL CONTRIBUTIONS TO A RESILIENT INDONESIA IN THE ERA OF SOCIETY 5.0. *SCIENTIFIC JOURNAL OF REFLECTION : Economic, Accounting, Management and Business*, 5(4), 877–890. <https://doi.org/10.37481/sjr.v5i4.564>
- SMERU. (2022). Diagnostic Report: Digital Skills Landscape in Indonesia. *SMERU Research Report No. 2 Diagnostic*, 2, 1–74. www.smeru.or.id.
- Syahlan, I. D., Hidayat, D. R., & Hidayat, O. S. (2023). Application of the Project Based Learning Model in Elementary Schools: Obstacles and Solutions of Science and Environment Content. *Jurnal Penelitian Pendidikan IPA*, 9(4), 2060–2067. <https://doi.org/10.29303/jppipa.v9i4.3285>
- Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, 28(6), 6695–6726. <https://doi.org/10.1007/s10639-022-11431-8>
- Tuhkala, A. (2021). A systematic literature review of participatory design studies involving teachers. *European Journal of Education*, 56(4), 641–659. <https://doi.org/10.1111/ejed.12471>
- Uzorka, A., Namara, S., & Olaniyan, A. O. (2023). Modern technology adoption and professional development of lecturers. *Education and Information Technologies*, 28(11), 14693–14719. <https://doi.org/10.1007/s10639-023-11790-w>
- Wibisono, M. Y., & Rahman, M. T. (2024). Preparing a Journal to be Accredited Nationally by Sinta. *Socio Politica*, 14(1), 8–14.
- Zen, S., Ropo, E., & Kupila, P. (2023). Constructing inclusive teacher identity in a Finnish international teacher education programme: Indonesian teachers' learning and post-graduation experiences. *Heliyon*, 9(6), e16455. <https://doi.org/10.1016/j.heliyon.2023.e16455>
- Zustiyantoro, D. (2022). The Proceedings of the English Language Teaching, Literature, and Translation (ELTLT) Data Integration and Lecturer Expertise: Its Relevance to the Academic Reputation of the Faculty of Languages and Arts UNNES. *The Proceedings of the English Language Teaching, Literature, and Translation (ELTLT)*, 11(1), 2580–7528.



Green marketing education and strategy to increase circular economy adoption in Sidomukti Village community, Lamongan Regency

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-10-30 Revised: 2024-12-06 Accepted: 2024-12-26 Published: 2025-04-08 Keywords Circular economy Education Green marketing	The Community Partnership Program (PKM) implemented in Sidomukti Village, Lamongan Regency, focuses on education and green marketing strategies to increase the adoption of a circular economy. The program objectives are: Empowering communities through processing coconut water waste into nata de coco. The activity is carried out by providing training on product marketing strategies, which are expected to improve the economic welfare of the community and reduce waste by encouraging local entrepreneurship. Despite challenges such as limited knowledge and facilities, ongoing training and support are expected to help communities overcome obstacles and achieve success. The benefits of the program include: Improving production infrastructure and utilizing digital marketing. The method used is to build sustainable partnerships and conduct periodic evaluations. This method is expected to provide long-term benefits for the people of Sidomukti Village. The program activities include socialization, training, technology application, mentoring, and evaluation. The community learns the production and marketing process of nata de coco, which has high economic value. As a result, the community gains new skills, increases income, and awareness of sustainable waste management. This program encourages collaboration with academics, government, and the private sector for better business development. It is that this program will succeed in improving community and environmental welfare. It is recommended to continue training and product innovation, was designed in the form of the enrichment program for weekend class was effectively run.
Kata Kunci Ekonomi sirkular Pendidikan Pemasaran hijau	Pendidikan dan Strategi Pemasaran Hijau untuk Meningkatkan Adopsi Ekonomi Sirkular oleh Masyarakat Desa Sidomukti, Kabupaten Lamongan. Program Kemitraan Masyarakat (PKM) yang dilaksanakan di Desa Sidomukti, Kabupaten Lamongan, berfokus pada edukasi dan strategi pemasaran hijau untuk meningkatkan adopsi ekonomi sirkular. Sasaran program adalah memberdayakan masyarakat melalui pengolahan limbah air kelapa menjadi nata de coco. Kegiatan dilakukan dengan memberikan pelatihan strategi pemasaran produk, yang diharapkan dapat meningkatkan kesejahteraan ekonomi masyarakat dan mengurangi sampah dengan mendorong kewirausahaan lokal. Meskipun menghadapi tantangan seperti keterbatasan pengetahuan dan fasilitas, pelatihan dan dukungan yang berkelanjutan diharapkan dapat membantu masyarakat mengatasi kendala dan mencapai keberhasilan. Manfaat program antara lain memperbaiki infrastruktur produksi dan memanfaatkan pemasaran digital. Metode yang digunakan adalah membangun kemitraan berkelanjutan dan melakukan evaluasi berkala. Metode ini diharapkan dapat memberikan manfaat jangka panjang bagi masyarakat Desa Sidomukti. Kegiatan program meliputi sosialisasi, pelatihan, penerapan teknologi, pendampingan, dan evaluasi. Masyarakat mempelajari proses produksi dan pemasaran nata de coco, yang memiliki nilai ekonomi tinggi. Hasilnya, masyarakat memperoleh keterampilan baru, meningkatkan pendapatan, dan kesadaran akan pengelolaan sampah berkelanjutan. Program ini mendorong kolaborasi dengan akademisi, pemerintah, dan sektor swasta untuk pengembangan bisnis yang lebih baik. Diharapkan program ini akan berhasil meningkatkan kesejahteraan masyarakat dan lingkungan. Disarankan untuk terus melanjutkan pelatihan dan inovasi produk, yang dirancang dalam bentuk program pengayaan untuk kelas akhir pekan agar berjalan efektif.

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INTRODUCTION

Circular economy is an economic model that focuses on the sustainable and efficient use of resources by minimizing waste and pollution while the concept of green marketing is a marketing strategy that promotes environmentally friendly and sustainable products and services. These two concepts are closely related. Green marketing can help drive the circular economy by, increasing consumer awareness of the benefits of the circular economy and the products/services that support it. Encouraging consumers to choose environmentally friendly and sustainable products/services. Supporting businesses that implement the circular economy model (Li et al., 2020; Sulich & Sołoducho-Pelc, 2022). In Lamongan itself, the potential for abundant natural resources that can be utilized by the community, one of which is coconut water waste for making Nata de coco is a food product made from coconut water and *Acetobacter xylinum* bacteria. This product has many health benefits and can be processed into various types of food and drinks. Coconut plants are a very potential commodity, all parts of the coconut plant are useful for human life needs. Coconut fruit consists of coconut fiber, shell, flesh, and coconut water. All parts of the coconut fruit are not wasted and can be used to produce industrial products. Coconut fiber can be used as fiber, doormats, brooms, car seats, and mattresses. The flesh of the fruit can be used as raw material to produce copra, coconut oil, coconut cream, coconut milk, and desiccated coconut, while coconut water can be used to make vinegar and nata de coco. The shell can be used to make charcoal, activated carbon, liquid smoke, and handicrafts. Building materials for building frames and handicrafts can be produced from coconut trunks (Alonso-Almeida et al., 2020; Agyabeng-Mensah et al., 2021; Arsawan et al., 2024; Bag et al., 2022; Kevin van Langen et al., 2021). Coconut water (*cocos nucifera*) is often wasted and causes problems due to its strong aroma after being thrown into the environment for some time. The amount of coconut water every day is much greater than the amount used. Coconut water waste processing can be done simply by making nata de coco, because making this product can help overcome the emergence of coconut water waste pollution (de Souza et al., 2022; Chen et al., 2020; Centobelli et al., 2021; Cantú et al., 2021). Coconut water is the main raw material for making Nata de Coco, while the coconut water used comes from ripe green coconuts.

Coconut water waste processing can be done simply by making nata de coco, because making this product can help overcome the emergence of coconut water waste pollution (Shi, et al, 2022; D'Amato & Korhonen, 2021). Coconut water is the main raw material for making Nata de Coco, on the other hand the coconut water used comes from ripe green coconuts. The coconut water used must be pure, not mixed with water or dirt, but it does not always have to be fresh (new coconut water). Coconut water contains various nutrients that can be utilized by bacteria that produce Nata de Coco. The nutrients contained in coconut water include: 1.28% sucrose sugar, various mineral sources including Magnesium and the presence of growth promoting factors, which are compounds that can increase the growth of nata-producing bacteria (*Acetobacter xylinum*). The presence of sucrose sugar in coconut water will be utilized by *Acetobacter xylinum* as a source of energy, as well as a source of carbon to form metabolite compounds including cellulose which forms Nata de Coco (Dwivedi & Paul, 2022; García-Salirrosas & Rondon-Eusebio, 2022; Hamam et al., 2021).

But in the context of a circular economy, there are several problems in marketing nata de cocos, namely consumers are still less aware of the benefits of nata de coco in the context of a circular economy, consumers do not fully understand how nata de coco can help reduce waste and pollution, lack of clear branding and labeling on environmentally friendly nata de coco products, consumers have difficulty in distinguishing nata de coco products that are produced using sustainable methods (Gustavo et al., 2021; Kar & Harichandan, 2022; Kaur et al., 2022; Kazancoglu et al., 2021). Nata de coco has great potential to become an environmentally friendly and sustainable product. However, to achieve this potential, efforts need to be made to increase consumer awareness, branding, and labeling, pricing, distribution, and collaboration. Coconut water waste management can contribute significantly to the Sustainable Development Goals (SDGs). For example, by processing coconut water waste into value-added products such as organic fertilizer or biogas, we can achieve SDG (Clean Water and Sanitation) by reducing water pollution. In addition, this initiative can support SDG (Responsible Consumption and Production) by reducing waste and promoting efficient use of resources. Thus, coconut water waste management not only helps protect the environment but also promotes sustainable development as a whole (Kustyawati et al., 2023; Kumar et al., 2023; Khan et al., 2022)

METHOD

The implementation method in this activity is the socialization method, question and answer, and discussion. The activity begins with counseling on coconut water waste, after which participants are explained about the utilization of

coconut water waste into processed food products. The second is training with the practice of making processed food products from coconut water waste into nata de coco. Throughout the implementation of the activity, the community is given the opportunity to ask questions related to waste processing. Participants discuss the process carried out during the activity. The training is carried out by means of direct practice with the village community as well as the application of technology that has been prepared by the team for utilization. As for mentoring and evaluation, it is carried out during the community service activity. This is done to monitor the program that has been implemented. Empowerment of mothers in Sidomukti Village, Lamongan Regency in order to improve food processing skills and reduce coconut water waste is carried out with a nata de coco making workshop. Coconut water is obtained from coconut sellers in traditional markets which are usually not utilized (Kristiandi et al., 2022; Manurung et al., 2024; Mardin & Lasalewo, 2021). The sustainability of the program expected in this program continues and the community can utilize coconut water waste which is in line with the concept of this empowerment, namely increasing income in general, namely the utilization of waste into blessings or a circular economy (Marrucci et al., 2021; Milios, 2021; Moreno-Mondéjar et al., 2021). In detail, the five steps of community service are explained as follows:

1. Socialization, the initial step of community service begins with socialization activities, by disseminating information and knowledge about waste management. implementation of socialization, discussion and Q&A. The introduction begins with counseling about waste, then an explanation of waste management and how to utilize it.
2. Training, the next step is to provide training to the community, especially the Sidomukti village community with experienced speakers in their fields. training with the practice of making processed food products from coconut water waste into useful products. During the activity, community activities in Sidomukti village conducted questions and answers related to waste processing. The process carried out during the activity was carried out through discussion and others.
3. Application of technology, after conducting training, the application of technology in the form of tools or materials made by the research team that had been designed and utilized by practicing directly with the Sidomukti village community.
4. Mentoring and evaluation, activities were carried out during community service activities and activities were also carried out to monitor programs that had been implemented. Efforts to improve skills in waste utilization were carried out through mentoring and workshops to improve waste utilization.
5. The sustainability of this program is expected to provide broader and ongoing benefits and the community can process waste that is relevant to the waste management solution in the empowerment program, which is useful for improving the welfare of the Sidomukti village community and its benefits are even broader.



Figure 1: Flowchart Activity

RESULTS AND DISCUSSION

Pre-implementation

Analysis

Coconut water waste processing can be done through women's empowerment, especially in areas with a high number of unemployed women. Empowerment can be one of the development approaches in the process of strengthening the economy and society to improve the welfare of the community, especially in rural areas (Nayal et al., 2022; Ncube et al., 2023; Prieto-Sandoval et al., 2022; Sharma et al., 2021). Women's empowerment in Sidomukti Village is one way to improve skills in waste processing that has not been touched so far. The problem of coconut water waste which is quite high and the lack of skills in processing this waste make women's empowerment in nata de coco processing important. Nata de Coco is a solid material like agar-agar but more chewy or like palm fruit, not soft, transparent white. A type of refreshing food or dessert and can be mixed into ice cream, fruit cocktails, yogurt and so on Nata is the result of *Acetobacter xylinum* fermentation with a substrate containing sugar, if the substrate used is coconut water, it is generally known as nata de coco. This product is widely known by the public and has a fairly high economic value. Empowering women, especially mothers and even youth groups in Sidomukti Village in processing coconut water waste into nata de

coco can be one way to increase women's independence (Suchek et al., 2021; Sulich & Sołoducho-Pelc, 2022; Tang et al., 2022). This program aims to increase knowledge of reducing coconut water waste and how to make nata de coco and improve the economy of the Sidomukti Village community.

Geographical Conditions and Natural Resources Sidomukti Village has a large amount of coconut water waste available in this village. The strategic location of the village with relatively easy access also supports the production and distribution of nata de coco products. **Community Skills and Knowledge** Most of the village community has basic skills in processing coconut-based products, but knowledge of fermentation technology and nata de coco production is still limited. The training provided plays an important role in overcoming this limitation by providing practical knowledge that can be applied directly. **Infrastructure and Facilities** Sidomukti Village has adequate basic infrastructure, but special facilities for nata de coco production still need to be improved. Provision of tools and materials for fermentation and hygienic production space are challenges that need to be overcome. **Social and Economic Aspects** The majority of the village population works in the agricultural sector with relatively low incomes. The program for processing coconut water waste into nata de coco has the potential to increase community income by opening up new business opportunities and diversifying the village economy (Yu et al., 2022).

Implementation

Socialization and training of coconut water waste processing into nata de coco. This activity not only focuses on the production process, but also on how to market nata de coco products in order to improve the welfare of local communities.

The event was attended by more than 25 PKK mothers and residents of Sidomukti Village, Lamongan Regency, who enthusiastically participated in each training session. The speakers presented were experts from the Ahmad Dahlan Institute of Technology and Business, Lamongan, who explained the steps and techniques for making nata de coco, from fermentation to marketing the final product.



Figure 2: Enthusiasm of Training Participants

Nata de Coco Making Process

Participants are taught starting from collecting coconut water waste, fermentation process using *Acetobacter xylinum* bacteria, to proper packaging techniques to ensure product quality. This fermentation process takes about 7-10 days, where coconut water will turn into nata de coco gel that is ready to be consumed.



Figure 3: Waste Management Training

Green or environmentally friendly marketing strategies

In the next session, participants received training on how to market nata de coco products. Some of the main points discussed include: Digital Marketing with the use of social media such as Instagram and Facebook to promote products widely. Cooperation with Retailers, namely establishing cooperation with local shops and supermarkets to expand market reach. Online Sales by Opening online stores on e-commerce platforms such as Tokopedia and Shopee to reach wider consumers.



Figure 4: Product Marketing Training

The participants seemed enthusiastic and hoped to immediately apply the knowledge they had gained. The event also included a Q&A session and discussion, where participants could share their experiences and the obstacles they faced in the process of making and marketing nata de coco. With this initiative, Sidomukti Village, Lamongan Regency, has the potential to become a famous nata de coco production center in East Java, bringing new hope to the local economy.

Business Development

During the implementation of community service, the enthusiasm of the participants was very much felt. Many participants looked very enthusiastic to learn and apply new techniques in processing coconut water waste into nata de coco. When using equipment such as fermentation techniques, they quickly mastered how it worked and even began to exchange tips to improve production results.



Figure 5. Production House Development

The most interesting moment was when they saw the first fermentation process and the nata de coco that was produced. The pride and satisfaction were clearly visible on their faces. In the practical session, the interaction between participants was very positive, with many discussions and collaborations taking place. Many participants stated that they felt more confident and motivated to develop this business seriously. This success not only brings economic benefits, but also strengthens the community spirit and collaboration in Sidomukti Village.

CONCLUSION

The socialization and training program for processing coconut water waste into nata de coco in Sidomukti Village has shown very positive results. The community gained practical skills in the fermentation and production process, and understood the importance of sustainable waste management. Support from academics, government, and the private sector strengthened this program, both in terms of technology, marketing, and infrastructure. In addition, the nata de coco products produced have high economic value, which contributes to increasing the income and welfare of the village community.

Continuity of Training and conducting advanced training to deepen community skills, including in terms of product innovation and more sophisticated marketing techniques. Infrastructure Development seeks to improve hygienic and adequate production facilities to support larger production scales. Digital Marketing by encouraging the use of digital platforms and e-commerce to expand the reach of the nata de coco market. Sustainable Partnerships to strengthen cooperation with academics, government, and the private sector to ensure ongoing support in various aspects of production and marketing. Periodic Evaluation by conducting periodic evaluations of the program to identify successes and obstacles, and making necessary adjustments so that the program remains effective and sustainable. It is hoped that the coconut water waste processing program into nata de coco can continue to develop and provide long-term benefits for the people of Sidomukti Village, and as widely as possible

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Thank you to all parties who have contributed and supported the success of this program. Community service entitled Education and Green Marketing Strategy for Increasing Circular Economy Adoption in Sidomukti Village, Lamongan Regency. Community service program and training on processing coconut water waste into nata de coco and its marketing strategy implemented in Sidomukti Village, Kembangbahu District. This program is a real manifestation of our commitment to empowering communities and supporting environmental sustainability.

Through this training, we strive to provide practical skills and in-depth knowledge to villagers so that they can process abundant coconut water waste into high-value products. In addition, this training also includes effective marketing strategies, so that the nata de coco products produced can reach a wider market and provide significant economic benefits to the community.

REFERENCES

- Agyabeng-Mensah, Y., Tang, L., Afum, E., Baah, C., & Dacosta, E. (2021). Organisational identity and circular economy: Are inter and intra organisational learning, lean management and zero waste practices worth pursuing? *Sustainable Production and Consumption*, 28, 648–662. <https://doi.org/10.1016/j.spc.2021.06.018>
- Alonso-Almeida, M. del M., Rodríguez-Antón, J. M., Bagur-Femenías, L., & Perramon, J. (2020). Sustainable development and circular economy: The role of institutional promotion on circular consumption and market competitiveness from a multistakeholder engagement approach. *Business Strategy and the Environment*, 29(6), 2803–2814. <https://doi.org/10.1002/bse.2544>
- Arsawan, I. W. E., Koval, V., Suhartanto, D., Hariyanti, N. K. D., Polishchuk, N., & Bondar, V. (2024). Circular economy practices in SMEs: aligning model of green economic incentives and environmental commitment. *International Journal of Productivity and Performance Management*, 73(3), 775–793. <https://doi.org/10.1108/IJPPM-03-2022-0144>
- Bag, S., Dhamija, P., Bryde, D. J., & Singh, R. K. (2022). Effect of eco-innovation on green supply chain management, circular economy capability, and performance of small and medium enterprises. *Journal of Business Research*, 141, 60–72. <https://doi.org/10.1016/j.jbusres.2021.12.011>
- Cantú, A., Aguiñaga, E., & Scheel, C. (2021). Learning from failure and success: The challenges for circular economy implementation in SMEs in an emerging economy. *Sustainability (Switzerland)*, 13(3), 1–34. <https://doi.org/10.3390/su13031529>
- Centobelli, P., Cerchione, R., Esposito, E., Passaro, R., & Shashi. (2021). Determinants of the transition towards circular economy in SMEs: A sustainable supply chain management perspective. *International Journal of Production Economics*, 242. <https://doi.org/10.1016/j.ijpe.2021.108297>
- Chen, T. L., Kim, H., Pan, S. Y., Tseng, P. C., Lin, Y. P., & Chiang, P. C. (2020). Implementation of green chemistry principles in circular economy system towards sustainable development goals: Challenges and perspectives. *Science of the Total Environment*, 716. <https://doi.org/10.1016/j.scitotenv.2020.136998>
- D’Amato, D., & Korhonen, J. (2021). Integrating the green economy, circular economy and bioeconomy in a strategic sustainability framework. *Ecological Economics*, 188. <https://doi.org/10.1016/j.ecolecon.2021.107143>

- de Souza, E. D., Kerber, J. C., Bouzon, M., & Rodriguez, C. M. T. (2022). Performance evaluation of green logistics: Paving the way towards circular economy. *Cleaner Logistics and Supply Chain*, 3. <https://doi.org/10.1016/j.clscn.2021.100019>
- Dwivedi, A., & Paul, S. K. (2022). A framework for digital supply chains in the era of circular economy: Implications on environmental sustainability. *Business Strategy and the Environment*, 31(4), 1249–1274. <https://doi.org/10.1002/bse.2953>
- García-Salirrosas, E. E., & Rondon-Eusebio, R. F. (2022). Green Marketing Practices Related to Key Variables of Consumer Purchasing Behavior. *Sustainability (Switzerland)*, 14(14). <https://doi.org/10.3390/su14148499>
- Gustavo, J. U., Trento, L. R., de Souza, M., Pereira, G. M., Lopes de Sousa Jabbour, A. B., Ndubisi, N. O., Chiappetta Jabbour, C. J., Borchardt, M., & Zvirtes, L. (2021). Green marketing in supermarkets: Conventional and digitized marketing alternatives to reduce waste. *Journal of Cleaner Production*, 296. <https://doi.org/10.1016/j.jclepro.2021.126531>
- Hamam, M., Chinnici, G., Di Vita, G., Pappalardo, G., Pecorino, B., Maesano, G., & D'Amico, M. (2021). Circular economy models in agro-food systems: A review. *Sustainability (Switzerland)*, 13(6). <https://doi.org/10.3390/su13063453>
- Jing Shi, Deyan Yang, Zunxiao Zheng, Y. Z. (2022). Strategic investment for green product development and green marketing in a supply chain. *Journal of Cleaner Production*, Volume 366. <https://doi.org/10.1016/j.jclepro.2022.132868>
- Kaur, B., Gangwar, V. P., & Dash, G. (2022). Green Marketing Strategies, Environmental Attitude, and Green Buying Intention: A Multi-Group Analysis in an Emerging Economy Context. *Sustainability (Switzerland)*, 14(10). <https://doi.org/10.3390/su14106107>
- Kazancoglu, I., Sagnak, M., Kumar Mangla, S., & Kazancoglu, Y. (2021). Circular economy and the policy: A framework for improving the corporate environmental management in supply chains. *Business Strategy and the Environment*, 30(1), 590–608. <https://doi.org/10.1002/bse.2641>
- Kevin van Langen, S., Vassillo, C., Ghisellini, P., Restaino, D., Passaro, R., & Ulgiati, S. (2021). Promoting circular economy transition: A study about perceptions and awareness by different stakeholders groups. *Journal of Cleaner Production*, 316. <https://doi.org/10.1016/j.jclepro.2021.128166>
- Khan, S. A. R., Umar, M., Asadov, A., Tanveer, M., & Yu, Z. (2022). Technological Revolution and Circular Economy Practices: A Mechanism of Green Economy. *Sustainability (Switzerland)*, 14(8). <https://doi.org/10.3390/su14084524>
- Kristiandi, K., Merdekawati, D., Sangkala, S., & Sari, D. (2022). Pendampingan Pembuatan Nata De Coco Dari Limbah Air Kelapa Tua Di Desa Perapakan. *To Maega : Jurnal Pengabdian Masyarakat*, 5(2), 223. <https://doi.org/10.35914/tomaega.v5i2.1039>
- Kumar Kar, S., & Harichandan, S. (2022). Green marketing innovation and sustainable consumption: A bibliometric analysis. *Journal of Cleaner Production*, 361. <https://doi.org/10.1016/j.jclepro.2022.132290>
- Kumar, M., Raut, R. D., Jagtap, S., & Choubey, V. K. (2023). Circular economy adoption challenges in the food supply chain for sustainable development. *Business Strategy and the Environment*, 32(4), 1334–1356. <https://doi.org/10.1002/bse.3191>
- Kustyawati, M. E., Rizal, S., Suharyono, S., & Nawansih, O. (2023). Aplikasi Teknologi Fermentasi Nata Decoco Untuk Memanfaatkan Limbah Air Kelapa Di Desa Bunut Pesawaran. *Jurnal Pengabdian Fakultas Pertanian Universitas Lampung*, 2(1), 265. <https://doi.org/10.23960/jpfp.v2i1.6985>
- Li, Q., Guan, X., Shi, T., & Jiao, W. (2020). Green product design with competition and fairness concerns in the circular economy era. *International Journal of Production Research*, 58(1), 165–179. <https://doi.org/10.1080/00207543.2019.1657249>
- Manurung, H., Naibaho, B., & Simbolon, E. (2024). Pengaruh amonium sulfat dan gula terhadap bobot produksi, ketebalan, kekerasan dan kadar serat nata de coco. *Journal of Agricultural Sciences (AJAS)*, 1(1), 1–10.
- Mardin, H., & Lasalewo, T. (2021). Pelatihan Pembuatan Nata De Coco Dari Limbah Air Kelapa Di Desa Dunu Kecamatan Monano Kabupaten Gorontalo Utara. *Jurnal Abdimas Gorontalo (JAG)*, 4(1), 24–28. <https://doi.org/10.30869/jag.v4i1.636>
- Marrucci, L., Daddi, T., & Iraldo, F. (2021). The contribution of green human resource management to the circular economy and performance of environmental certified organisations. *Journal of Cleaner Production*, 319. <https://doi.org/10.1016/j.jclepro.2021.128859>
- Milios, L. (2021). Overarching policy framework for product life extension in a circular economy—A bottom-up business perspective. *Environmental Policy and Governance*, 31(4), 330–346. <https://doi.org/10.1002/eet.1927>
- Moreno-Mondéjar, L., Triguero, Á., & Cuerva, M. C. (2021). Exploring the association between circular economy strategies and green jobs in European companies. *Journal of Environmental Management*, 297. <https://doi.org/10.1016/j.jenvman.2021.113437>
- Nayal, K., Kumar, S., Raut, R. D., Queiroz, M. M., Priyadarshinee, P., & Narkhede, B. E. (2022). Supply chain firm performance in circular economy and digital era to achieve sustainable development goals. *Business Strategy and the Environment*, 31(3), 1058–1073. <https://doi.org/10.1002/bse.2935>

- Ncube, A., Mtetwa, S., Bukhari, M., Fiorentino, G., & Passaro, R. (2023). Circular Economy and Green Chemistry: The Need for Radical Innovative Approaches in the Design for New Products. *Energies*, 16(4). <https://doi.org/10.3390/en16041752>
- Prieto-Sandoval, V., Torres-Guevara, L. E., & García-Díaz, C. (2022). Green marketing innovation: Opportunities from an environmental education analysis in young consumers. *Journal of Cleaner Production*, 363. <https://doi.org/10.1016/j.jclepro.2022.132509>
- Sharma, N. K., Govindan, K., Lai, K. K., Chen, W. K., & Kumar, V. (2021). The transition from linear economy to circular economy for sustainability among SMEs: A study on prospects, impediments, and prerequisites. *Business Strategy and the Environment*, 30(4), 1803–1822. <https://doi.org/10.1002/bse.2717>
- Suchek, N., Fernandes, C. I., Kraus, S., Filser, M., & Sjögrén, H. (2021). Innovation and the circular economy: A systematic literature review. *Business Strategy and the Environment*, 30(8), 3686–3702. <https://doi.org/10.1002/bse.2834>
- Sulich, A., & Sołoducho-Pelc, L. (2022). The circular economy and the Green Jobs creation. *Environmental Science and Pollution Research*, 29(10), 14231–14247. <https://doi.org/10.1007/s11356-021-16562-y>
- Tang, Y. M., Chau, K. Y., Fatima, A., & Waqas, M. (2022). Industry 4.0 technology and circular economy practices: business management strategies for environmental sustainability. *Environmental Science and Pollution Research*, 29(33), 49752–49769. <https://doi.org/10.1007/s11356-022-19081-6>
- Yu, Z., Khan, S. A. R., & Umar, M. (2022). Circular economy practices and industry 4.0 technologies: A strategic move of automobile industry. *Business Strategy and the Environment*, 31(3), 796–809. <https://doi.org/10.1002/bse.2918>



The role of women entrepreneurs to support food security and SDGs 2030 in the tourism sector through application training

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Article history Received: 2024-11-15 Revised: 2025-02-05 Accepted: 2025-02-23 Published: 2025-04-08 Keywords Business Finance Digital Literacy Food Security SDGs Tourism Business Kata Kunci Keuangan Bisnis Literasi Digital Ketahanan Pangan SDGs Bisnis Pariwisata	Women have a significant role in supporting food security through women's empowerment programs in the tourism sector. Empowering women in the tourism sector can help improve the family economy. The training held in this activity aims to train and introduce information technology to local communities, especially women who are active as tourism entrepreneurs. The material presented includes information on how to manage business finances and digital literacy so that it can improve the quality of products sold. This training program is a form of women's empowerment to support food security and the achievement of SDGs 2030. Thirty people participated in this training activity. The results of the training activity showed that participants had a better understanding of how to process finances and use Android-based sales technology applications. This training activity includes three stages: 1) Introduction and training in business financial management and using Android in tourism businesses, 2) Mentoring, and 3) Practice. The implication of this training-based research is that tourism business actors can be more familiar with the use of applications that are utilized for tourism business activities. Tourism business actors, especially women, can have a significant impact on community economic growth which directly supports the achievement of SDGs 2030 through increased tourism business productivity. Peran wirausaha perempuan dalam mendukung ketahanan pangan dan SDGs 2030 di sektor pariwisata melalui pelatihan aplikasi. Perempuan memiliki peran yang signifikan dalam mendukung ketahanan pangan melalui program pemberdayaan perempuan di sektor pariwisata. Pemberdayaan perempuan di sektor pariwisata dapat membantu meningkatkan perekonomian keluarga. Pelatihan yang diselenggarakan pada kegiatan ini bertujuan untuk melatih dan mengenalkan teknologi informasi kepada masyarakat sekitar, khususnya perempuan yang aktif sebagai wirausaha pariwisata. Materi yang disampaikan meliputi informasi tentang cara mengelola keuangan usaha dan literasi digital sehingga dapat meningkatkan kualitas produk yang dijual. Program pelatihan ini merupakan salah satu bentuk pemberdayaan perempuan untuk mendukung ketahanan pangan dan pencapaian SDGs 2030. Sebanyak 30 orang mengikuti kegiatan pelatihan ini. Hasil kegiatan pelatihan menunjukkan bahwa peserta lebih memahami cara mengolah keuangan dan menggunakan aplikasi teknologi penjualan berbasis android. Kegiatan pelatihan ini meliputi tiga tahap yaitu: 1) Pengenalan dan pelatihan pengelolaan keuangan usaha dan penggunaan android pada usaha pariwisata, 2) Pendampingan, dan 3) Praktik. Adapun implikasi dari penelitian berbasis pelatihan ini adalah pelaku usaha pariwisata dapat semakin terbiasa dalam penggunaan aplikasi yang dimanfaatkan untuk kegiatan bisnis pariwisata. Para pelaku usaha pariwisata, terutama perempuan dapat memberikan dampak yang signifikan terhadap pertumbuhan ekonomi masyarakat yang secara langsung mendukung pencapaian SDGs 2030 melalui peningkatan produktivitas bisnis pariwisata. Copyright ©2025, Seniwati, et al This is an open access article under the CC-BY-SA

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INTRODUCTION

Currently, one of the most vigorous global development agendas to be achieved to the fullest is the Sustainable Development Goals or SDGs. SDGs are a crucial agenda in achieving a more inclusive and sustainable global development by taking into account various aspects ranging from the economy, society, to the environment. In practice, the SDGs have at least 17 main goals that are integrated to achieve prosperity for all parties without exception. The goals in the SDGs include no poverty; no hunger; health and well-being; quality education; gender equality; clean water and sanitation; clean and affordable energy; decent work and economic growth; industry, innovation, and infrastructure; reducing inequalities; sustainable cities and settlements; responsible consumption and production; tackling climate change; marine ecosystems; terrestrial ecosystems; peace, justice, and resilient institutions; and partnerships to achieve goals. For this reason, achieving the SDGs requires a balance between efforts to increase economic growth with efforts to improve people's welfare, and environmental conservation (Elgin & Elveren, 2024). Through these efforts, the SDGs are expected to become a momentum that encourages multi-sector development that is inclusive and beneficial to the global scope.

In achieving SDGs, there are many influential catalysts, ranging from politics, economy, social, education, health, tourism, and so on. Of these various catalysts, the tourism sector is one that is dominant enough to be developed in supporting the realization of SDGs. This is based on the multidimensional nature of the tourism sector so that it is suitable to be placed as a potential contributor to the SDGs (Elgin & Elveren, 2024). Moreover, the strengthening of multi-stakeholder cross-country partnerships in international tourism can be used to strengthen the implementation of the SDGs (Scheyvens & Cheer, 2022). In 2017, the United Nations World Tourism Organization (UNWTO) even declared tourism as the main catalyst in achieving the SDGs. The declaration by UNWTO outlines at least five main pillars of the tourism sector in relation to the fulfillment of the SDGs which include inclusiveness and social welfare, sustainable economic growth, cultural diversity, environmental protection, and peace. The main function of the declaration is to become a basic principle that implements the value of SDGs as a code of ethics in global tourism practices (Buhalis et al., 2023).

Tourism is vital in realizing the UN Sustainable Development Goals (SDGs), especially in promoting gender equality and women's empowerment (Kipchirchir et al., 2024). The main foundation is that human welfare is a key dimension in the SDGs, which implies that welfare indicators can determine the success of the tourism sector in achieving the SDGs agenda. In this case, tourism creates employment opportunities and income for marginalized groups so that it can be relevant to efforts to fulfill welfare indicators (Dwyer, 2022). More specifically, women's groups are often placed as marginalized groups that make empowerment practices an urgency that must be realized. The realization of empowerment can have great significance to the emergence of social innovations that are egalitarianism and facilitate women in various co-creations, including women's tourism entrepreneurship and gender-sensitive tourism sector partnerships (Pécot et al., 2024). Thus, a tourism sector developed with elements of gender equality will have great significance in meeting sustainable development goals.

Of the 17 sustainable development goals, one of the most relevant goals to the issue of empowerment is SDGs No. 5 related to gender equality. SDG No. 5 focuses on gender equality, which aims to combat gender inequality by increasing women's role in all sectors, including tourism. The involvement of women in supporting food security in the tourism sector can also lead to the diversification of tourism offerings, improve the overall customer experience, and promote sustainable practices that protect the environment and natural resources. The tourism sector can support women's economic empowerment to increase equal opportunities for women in business, education, and employment, as well as the same wages as men and access to financial services (Katsekor et al., 2024). Women's empowerment in the tourism sector is directly related to the aspect of employment. In practice, the global tourism sector creates opportunities for many women to earn income obtained through various forms ranging from hotel management and catering, handicraft sales, technical and managerial workers, even leaders, as well as various other formal and informal jobs. Through these various opportunities, the tourism sector can encourage increased women's empowerment which benefits women to be stronger financially, economically, and socially (Ahmed et al., 2024). Empowering women is one of the

indicators to achieve gender equality. Therefore, increasing women's empowerment in the tourism sector continues to receive appreciation from the central and regional governments.

Tourism is one of the primary service industries in developing countries such as Indonesia. One of the women involved in supporting food security in the tourism sector is tourism entrepreneurship. Women can also support sustainable tourism development through various skills improvement training. Tourism contributes around 10% of gross domestic product (GDP) globally and has provided one in four new jobs worldwide, making tourism the most significant contributor to employment (Teshome et al., 2022). According to data from the World Travel and Tourism Council, the tourism sector has created around 543 thousand new jobs by 2023 (WTTC, 2024). These data show that the tourism sector has positively impacted local economic development. Increasing development will undoubtedly reduce poverty. Therefore, empowering women in tourism is expected to increase the family economy.

Efforts to improve economic levels through empowering women in the tourism sector are also increasingly encouraged by the increasingly strong role of women tourism entrepreneurs (WTE). The role of WTE in the tourism sector intersects a lot with digital entrepreneurship which moves as a counterweight for women to secure opportunities to strengthen global entrepreneurship which is often limited by social and cultural barriers. Through digital competencies, women can be empowered by utilizing online platform-based entrepreneurship that utilizes technological advances. Unfortunately, the role of WTE is still not fully realized due to obstacles such as difficulties for women to improve digital competencies as a result of structural inequalities that make training programs for women less adapted, social inequalities that hinder access for women, and gender stereotypes that are often biased (Khoo et al., 2024). Therefore, efforts to maximize the role of women through digital technology are needed. Women's mastery of digital technology is not only useful for strengthening their role in the tourism sector, but also realizing the success of women's empowerment which aims to achieve gender equality as one of the goals in the SDGs.

One form of women's empowerment that is relevant to the context of advances in digital technology is through the empowerment of platforms that can be used to maximize the potential of women's micro-entrepreneurs in the tourism sector. The digital platform is one of the tools used to empower women through breaking down cultural barriers and overcoming challenges in the form of location, time, and process in doing business. The utilization of digital platforms for women's empowerment in the tourism sector is based on the aspects of speed, accessibility, and affordability offered by various digital platforms so that women's entrepreneurial activities in tourism can grow and be competitive, and reach a wider range of customers (Ditta-Apichai et al., 2024). In this case, digital technology platforms can be utilized not only to promote tourist destinations, but also to sell various products and souvenirs typical of a tourist attraction.

This research is in the form of training held for the community, especially for those active as tourism business actors. The training provided is in the form of technology, primarily IT (information technology), to support online sales for tourism business actors. Online sales technology is one part of multimedia technology, which is essential because it is one part of managing industrial tourism, and it can serve intelligent decision-making from the government, companies, or foreign and domestic tourists (Ying et al., 2024). Technology, communication, and information are strategies for developing tourism, so efficiency and effectiveness are among the supporting factors in promoting a tourism destination (Liu et al., 2023). Technology is essential in the tourism sector, so training is needed for tourism business actors.

This multimedia technology training for tourism business actors also supports the 17 sustainable development goals (SDGs), focusing on gender equality and women's empowerment (Akanle et al., 2022). In realizing the fulfillment of the SDGs, the use of technology plays a role in expanding market opportunities for businesses of people who previously had limited access. Then the community will gain greater job security and opportunities, increased financial capability, and improved living standards through entrepreneurial growth. In addition, the use of technology also allows local communities to participate more actively in the decision-making process and management of sustainable tourism sector development, thus encouraging the strengthening of community participation (Ali et al., 2020). Thus, training in the use of technology is a

momentum to realize the harmony between sustainable development and women's empowerment in the tourism sector through the use of digital advances.

Apart from the urgency of utilizing technology in encouraging women's empowerment in the tourism sector that is relevant to the goals of the SDGs, writings on women's empowerment through multimedia technology training, especially online sales application training, are still scarce. Therefore, research through this training is fundamental because we can measure the ability of tourism business actors in small villages to use application technology. Guided by the concepts and theories of women's empowerment and SDGs, this research aims to describe the dynamics of utilizing digital technology through training for women's entrepreneurial groups in the tourism sector that represent a form of inclusive and equal sustainable development as a goal of the SDGs.

METHOD

This community service activity was conducted in Sipatuo village, Patampanua sub-district, Pinrang district, South Sulawesi Province. This village is 14 km from the capital of Pinrang district. The village has 4,138 people. The number of men is 2,061 people, and the number of women is 2,077 people (BKKBN, 2024). The method used was training, discussion, and interviews with training participants for three days from May 12 to May 15, 2024. The first material was related to business financial management. The second material was associated with the sale of Android-based tourism business results. The training participants came from the Sipatuo village community, village officials, and tourism business actors. The training was held for three days. On the first day, we surveyed tourism business actors. On the second day, we provided training. On the third day, we offered mentoring. The speakers came from Hasanuddin University, consisting of three people. The three people have expertise in finance, utilization of marine products, and international cooperation. Then, one speaker from the Muslim University of Indonesia who has expertise in information technology. The following is a list of training participants.

Table 1. Training Participants

Variable	Participant	Frequency	Percentage
Gender	Male	5	17
	Female	25	83
Age (year)	1965 - 1980	20	67
	1981 - 1996	10	33
	1997 -2012	0	0
Education	Senior High School	24	80
	Diploma/Bachelor	6	20
	Master	0	0
	Doctor	0	0
Income monthly	More than Rp.500.000 (32.25 USD)	5	17
	Rp.500.001 – Rp.2.500.000 (32.25 – 161.26 USD)	10	33
	Rp.2.500.000 – Rp.4.500.000, (161.26 – 290.27 USD)	10	33
	Rp. 4.500.000 – Rp.6.500.000, (290.27 USD – 419.29 USD)	5	17
Occupation	Students (senior high school)	4	13
	Private Sector	5	17
	Lecturer/teacher	0	0
	Looking for job	3	10
	Servant society employee	4	13
	Entrepreneurship	10	34
	Others	4	13

THEORY

Women Empowerment Theory

Development is one of the primary keys that drives the realization of women's empowerment, especially in the economic sector and access to work productivity, because development realizes the elimination of various sources of unfreedom, including poverty, economic opportunity gaps, and social deprivation. In realizing development, Amartya Sen explains that there are at least five types of freedom instruments that play an essential role in contributing to free development. These instrumental freedoms include political freedom, economic facilities, social opportunities, transparency guarantees, and protective security. These freedom instruments strengthen common interests through empirical relationships that bind various types of differences so that development can be realized inclusively (Sen, 1999). Instrumental freedom in development practices encourages strengthening empowerment efforts that have the end result of achieving equality in achieving development. If the practice can be implemented, then the gap in roles between women and men can be eliminated with development that focuses on equal freedom and participation.

Amartya Sen explains that despite increasing global prosperity, the modern world often denies fundamental freedoms to several community groups. This rejection is usually experienced by women who limit their substantive liberties. Therefore, the practice of instrumental freedom becomes a great urgency that must be implemented so that oppression against women can be eliminated. Among the various instrumental liberties explained previously, economic facilities have a significant role in realizing women's empowerment. Economic facilities refer to opportunities to utilize economic resources for production, consumption, and exchange purposes. Fulfilling aspects of economic facilities will align with fulfilling a person's economic rights, which will contribute directly to increasing income and encouraging economic development (Sen, 1999). Therefore, the process of fulfilling economic facilities that realize equal opportunities will provide convenience for women to be economically empowered. Empowering women in the financial sector increases their role and productivity and access to a better economic life and strengthens women's positions in decision-making.

The concept of women's empowerment needs to be interpreted systematically in order to get the main core of the practice that is to be realized. Empowerment is broadly interpreted as respect for rights, self-esteem, and choices to control life independently (Labadi, 2022). Women's empowerment is related to improving skills, knowledge, and traditional experiences owned by women to be used as a contribution to community resilience. The presence of women's empowerment is a response to patriarchal stereotypes that limit women's involvement in society (Pakuna et al., 2024). The description is in line with the research method that uses training to realize women's empowerment. The training targeted at women will improve their skills in the economic process so that it can be an important aspect in achieving inclusive, sustainable development goals.

To understand the empowerment process more optimally, this study applies the women's empowerment approach introduced by Naila Kabeer. Women's empowerment begins with a process that places women in a position where they cannot determine strategic life choices independently. Therefore, Naila Kabeer argues that women's empowerment must be a practice that involves women maximally in the decision-making process that can affect their lives. In the process of women's empowerment, there are three interrelated dimensions: resources, agency, which includes the process and decision-making, and achievement, which is the final result that is desired to be realized (Kabeer, 1999). In this study, the three dimensions of empowerment are represented through the role of women as business actors in the tourism sector. Resources are represented through equal access and the role of women as human resources. Agency, which is a process, is realized through training methods to encourage online sales productivity in the tourism sector. Then, the achievement is the fulfillment of SDGs values, especially gender equality and increasing women's economy.

This study specifically discusses women's empowerment in the economic and tourism sectors. Therefore, a more significant understanding of the empowerment process and tourism practices is needed. Women's empowerment carried out through the tourism sector often leads or is oriented towards the process so that it is very closely related to sustainable development (Efthymiadou & Farmaki, 2024). However, the tourism sector tends to perpetuate gender discrimination based on stereotypes due to bias in gender representation which results in the formation of structural problems that are detrimental to women (Labadi, 2022). Therefore, this study focuses on the form of women's empowerment to support food security and the achievement of SDGs 2030 in the tourism sector through training. This training aims to eliminate gender bias that occurs and also to strengthen the role of women in the tourism sector so that they are no longer disadvantaged.

SDGs

SDGs are a global agenda that is essential in the normative progress of global development governance and includes 17 main goals. The goals in the SDGs include no poverty; zero hunger; health and well-being; quality education; gender equality; clean water and sanitation; clean and affordable energy; decent work and economic growth; industry, innovation, and infrastructure; reducing inequality; sustainable cities and settlements; responsible consumption and production; handling climate change; marine ecosystems; terrestrial ecosystems; peace, justice, and strong institutions; and partnerships to achieve goals. SDGs are an ambitious agenda that is universal and inclusive to realize sustainable development and can face various social, economic, and environmental challenges. The implementation of SDG practices is designed with multi-stakeholder and decentralized initiatives to involve the active participation of all countries (Fukuda-Parr et al., 2022). The implementation of SDGs emphasizes the collective efforts of countries to jointly achieve social welfare. The practice of SDGs organizes three main categories of development that must be realized, including economic development, environmental sustainability, and social inclusion. These three categories must be realized sustainably by utilizing ideal governance at the local, national, regional, and global levels (Sachs, 2012).

The main significant point in the SDGs is the process of making the issue of sustainable development a framework for the overall development process and resolving gaps between various institutions that have become part of the global policy-making process (Fukuda-Parr et al., 2022). The meaning is that SDGs involve various actors, including government, epistemic groups, international organizations, academics, and civil society, whose responsibilities sometimes overlap to achieve inclusive development collectively. Another critical issue developed massively in SDGs is gender equality and women's empowerment. Mainstreaming a gender perspective is a crucial practice in the implementation and monitoring of SDGs practices because it can ensure that no party is marginalized or loses their rights and opportunities. Thus, SDGs have a significant positive impact on women through accelerating development and preventing regression so that women can inclusively avoid poverty and other problems (UN Women, 2018). The SDG agenda's attention to women's participation is very clear with the presence of SDG goal No. 5 related to gender equality. The SDGs clearly pay attention to inclusive development and no longer leave certain community groups behind.

Physical and non-physical investments are needed to realize the SDGs, and they can be the main drivers of the development process. Human resource development is one of the most important forms of investment in achieving sustainable development. Investment in human resource development, or what is also known as human capital, is related to increasing the capacity and capability of the community. Human capital is necessary because it places humans as the center of development with the ultimate goal of achieving community welfare that aligns with the SDGs' values. In practice, human capital is limited to education, health, and community productivity (Alisjahbana & Murniningtyas, 2018). This concept is in line with this research, which focuses on empowering women through training activities that will contribute directly to the development of community resources, especially women so that they can significantly improve their quality and productivity.

RESULTS AND DISCUSSION

Economic Growth Through Tourism Village Development

The tourism industry can affect economic and community development. Tourism can also contribute to economic growth and increase community income sources directly and indirectly. Tourism development increases economic growth, reduces poverty, and preserves natural and cultural resources. Therefore, tourism development has a vital role in improving community welfare. Rural community-based tourism development can encourage small and medium-scale industries that can be carried out in a labor-intensive manner and grow the rural community economy by developing small and medium-sized businesses or MSMEs. Micro, Small, and Medium Enterprises (MSMEs) advance the Indonesian economy because they can absorb labor and reduce unemployment (Yasir et al., 2021). Several training participants said that tourism development is one way to encourage economic growth of the community both directly and indirectly through increasing community income. Encouraging industry on the scale of Micro, Small, and Medium Enterprises (MSMEs) through developing tourism businesses is one crucial aspect of creating the Indonesian economy and employment (interview, May 12th, 2024).

Tourism villages can be a driver to create economic growth based on the concept of local wisdom. Tourism villages can grow independently within village community groups and develop rapidly with government

support. The mandate of Law No. 10 of 2009 states that tourism development is a national development that is carried out systematically, planned, integrated, sustainable, and responsible while still protecting religious values, culture in society, environmental preservation, and national interests (Yasir et al., 2021). Training participants said that the existence of tourist villages is protected by law because national development can drive economic growth based on the concept of local wisdom from residents (interview, May 12th, 2024).

Several tourist villages were formed in various regions (Pradhipta et al., 2021). Sipatuo Village, through village officials and the community, is trying to make its area a tourist village. Meanwhile, the village secretary who participated in this training said that one of the government's efforts in supporting the development of the community's economy is to help the community's tourism economic efforts. One example of the community's efforts in developing its economic capabilities is Sipatuo Village, which is trying to enter the category of a tourist village (interview, May 12th, 2024). There are several requirements that must be met to be developed as a tourist village, such as good location accessibility, having qualified tourist attractions, and support from the community and local officials (Prayitno et al., 2023). Based on these requirements, Sipatuo village is a potential area to be developed as a tourist village object. However, it certainly requires careful preparation so that its development as a tourist village can be sustainable.

The 2023 Sipatuo Village Government Work Plan (RKPDES) explains that several problems are obstacles to village development. These obstacles include the provision of inadequate street lighting, suboptimal highway access, and the need for repairs or provision of bridges to strengthen village mobility (Pemerintah Desa Sipatuo, 2023). For this reason, the head of Sipatuo village, who also attended the training, said that the Sipatuo village government needed to overcome these obstacles so that village development could go hand in hand with the development of tourist villages (interview, May 12th, 2024). Adequate facilities and infrastructure will play a significant role in attracting tourists and encouraging the strengthening of Sipatuo village as a tourist village. Moreover, to improve the village economy, it is necessary to optimize the use of village wealth, one of which can be carried out through the practice of tourist villages.

The Sipatuo village government has a central focus in the 2022-2027 Village Medium-Term Development Plan (RPJMDES) to increase the village's original income from a projection of IDR 5,000,000 (\$313 US) in 2022 to IDR 15,000,000 (\$937 US) in 2027. The projected increase in the original income of the Sipatuo village is attempted by optimizing income through regional wealth and community participation (Pemerintah Desa Sipatuo, 2022). This means that the village community must actively help the government encourage the productivity of Sipatuo village, which can be realized through the tourism sector. The community and the government promote tourism to attract tourists, ultimately increasing the town and community economy. The Sipatuo village secretary said that the tourism offered in Sipatuo is not only limited to nature tourism but also includes the community's socio-culture and culinary traditions in the form of typical Bugis cakes (interview, May 12th, 2024).

Women Empowerment through Digital Training

Sipatuo Village has many potentials that have not been optimally processed by the government and local communities. This condition is caused by the limited budget owned by the local government. The Secretary of Sipatuo Village said that the limited village budget caused many potentials that could not be processed using more modern technology (interview, May 12th, 2024).

In the 2023 Sipatuo Village Government Work Plan (RKPDES), there are several main issues concerning community empowerment, including the need for training for local RT/RW, the need for training for residents to increase productivity such as through making bread and chips, and the need for capital for women (Pemerintah Desa Sipatuo, 2023). The work plan represents the urgency of women's empowerment practices through training methods to realize inclusive development in Sipatuo village. Empowerment is the momentum that can strengthen society's contribution, especially women's, to driving local economic growth.

Regarding women's empowerment, Amartya Sen explains that its fulfillment requires instrumental freedom, one aspect of which is economic facilities. Economic facilities encourage the strengthening of women's opportunities to utilize financial resources (Sen, 1999). The concept aligns with the current conditions in Sipatuo village, which has many potential economic resources but cannot be processed optimally. Women can play an active role through various entrepreneurial activities that introduce local products so that they can be marketed massively and become a stable source of income for the community's economy. Through women's empowerment, the benefits of various potential economic resources in Sipatuo village will also be found so that they are no longer sidelined.

According to Kabeer, there are three dimensions of the women's empowerment process, namely resources, agency, and achievement (Kabeer, 1999). These three dimensions are then implemented in women's empowerment in Sipatuo village by prioritizing training methods to realize community productivity and skills. The resource dimension is represented through two main aspects: economic resources in Sipatuo village and women as human resources. Women are the main actors who play a role in processing economic resources to realize significant economic development in the Sipatuo village area. The selection of women as the central resource is not only to discover the process of women's empowerment but also to realize inclusive development and no longer marginalize women.

The agency dimension intended for women's empowerment in Sipatuo village is a training process that encourages the improvement of women's human resources. The training process carried out includes two primary materials. First, training in business financial management. Considering that Sipatuo village experiences obstacles related to village funds and budgets, training is needed to help manage the finances of the local community. Especially for women who are supported in being active in entrepreneurial activities. The entrepreneurial practices carried out by women in Sipatuo village are in the culinary sector by utilizing the tourism potential in the area. This is in line with what was explained earlier, which is that one of the challenges of empowerment in Sipatuo village is the need for training in making bread and chips. In addition, training is also carried out by training the community to process other products that have superior appeal and are to be introduced as typical Sipatuo regional tourism business products. Financial management training is also carried out to overcome obstacles in the form of a lack of investment for women in Sipatuo village. By strengthening financial management, tourism businesses pioneered by women can be more productive and enhance product processing to attract investors. A reasonable financial management basis is a reinforcement so that tourism business activities carried out by women can run sustainably.

Second, through training in selling Android-based business results. UN Women reports that women's digital knowledge and skills are 25% smaller than men's. This requires women to acquire digital literacy, which includes skills in using and utilizing technology (UN Women, 2024). Therefore, training methods based on digital progress will be relevant to support women's empowerment in Sipatuo village. The most important training is related to selling digital-based tourism business results so local products can reach a broader market and be known more massively. Participants in this digital-based training are not only women but also men as participants. This training is carried out by introducing various marketplaces and their use in directly marketing products. The presenters provided training on using Android-based marketplace applications to encourage Sipatuo village tourism businesses to grow and compete productively. If business actors already have digital skills to market their products, then the company being run can be sustainable and significantly impact the community's economic growth.



Figure 1. Presenter Training

From the training process carried out above, the resulting achievement dimension is the contribution of women to the economy that realizes the economic growth of the local community. According to UN Women, women's economic empowerment is a collective transformative process that denounces inequality and balances competition so that rights, access, ownership, control over resources, and income can be enjoyed fairly by women (Gantner & Quan, 2024). Thus, empowering women in Sipatuo village through training methods is a form of achieving collective economic transformation in maintaining food security. This training is no longer gender biased because it is based on the values developed by UN Women to achieve the 2030 SDGs. In addition, digital training for women not only represents inclusive technological progress but also represents a balance of access for women and men so that no party is left out of its role. Digital training is also a form of implementing the concept of empowerment by utilizing the values of technological progress. This is based on the concept of women's empowerment related to improving skills and knowledge (Pakuna et al., 2024) so that the implementation of training is a concrete manifestation of empowerment practices. Through digital training, the skills and knowledge of women's groups towards digitalization will be strengthened so that it can encourage them to increasingly innovate in utilizing digital technology in their tourism businesses.

Especially in Sipatuo Village, digital training is a relevant momentum to support the realization of this area as a tourist village in Indonesia. Smart tourism villages enable the integration of resources, digital technology and tourism infrastructure in producing quality tourism products and services (Kusumastuti et al., 2024). Thus, digital training not only increases the competence of the community, especially women in developing competitive tourism products, but also encourages collaboration and optimization of resource utilization and infrastructure availability as a basis for selling power and competitiveness developed through the use of digital technology in strengthening the position of Sipatuo Village as a leading tourism village.

The Role of Women in Realizing SDGs

One of the main goals in the SDGs is gender equality which encourages inclusive development for all without gender bias. As one of the main goals of the SDGs, gender equality is related to several crucial things concerning gender issues such as guaranteeing equal rights between women and men to economic resources; the use of technology that can support women's empowerment (UN Women et al., 2024). Therefore, women who participated in this training activity have had a significant role in realizing the fulfillment of the 2030 SDGs because it is one of the main goals that we want to achieve in inclusive development.



Figure 2. Training Participants

Gender equality, as stated in the SDGs goals, relates to respecting the differences and roles of women and men equally. Then, SDGs goal no. 5 also relates to the interaction between other goals (Advocates for International Development, 2022). Thus, fulfilling gender equality goals can contribute to other development goals such as poverty alleviation, economic growth, and reducing inequality. In practice, women have a crucial role because they are critical actors in fulfilling the equality aspect of sustainable development. Women play a direct role in accommodating demands for the fulfillment of rights and disparities that have so far placed women in inequality, thus hindering inclusive and sustainable development. In the economic sector, women can directly contribute to economic growth and security by increasing the productivity of entrepreneurial activities achieved through empowerment.

In SDG's goal no. 5, one of the main highlights is the availability of access to funding for women entrepreneurs. To achieve sustainable development, it is necessary to have partnership facilities with investors and financial institutions that are sensitive to gender to impact women's economic empowerment positively (UN Women et al., 2024). The meaning is that sustainable development and the role of women are interconnected. Sustainable development provides guarantees and protection for women to gain access to economic independence and freedom from all forms of discrimination. If these aspects have been implemented effectively, women can act as agents who can grow the economy and move to encourage the realization of the SDGs goals. For example, what happened in Sipatuo village, SDGs provide motivation and protection for women to be active entrepreneurs in the form of digital-based tourism businesses as a form of equality. This practice offers significant results in achieving SDG values, which include equality, economic growth, and sustainability. The support given to women to become productive entrepreneurs provides women with access to a more decent economy and minimizes the gap in inequality in society. Thus, the achievement of SDGs will be increasingly apparent through the active role of women in developing productive and highly competitive businesses.

Concerning the training method used to realize women's empowerment in Sipatuo village, the practice is directly related to efforts to improve the quality of human capital, which is one of the efforts to realize SDGs. Human capital is the development of human resources by increasing the capacity and capability of the community (Alisjahbana & Murniningtyas, 2018). The training in Sipatuo village is in line with increasing community capacity and capability, so it is relevant to efforts to fulfill the SDGs. Women's groups in Sipatuo village who are active entrepreneurs of tourism business products and participate in digital development training will be more skilled in economic activities and will contribute actively as development agents. Thus, women can play a role in realizing the SDGs through developing and improving the quality of their human capital.

CONCLUSION

Based on the training activities held in Sipatuo village show that there are empowerment activities involving women to support food security and achieve SDGs 2030. This training activity can strengthen the role of women in the tourism sector because it can improve the skills of training participants. After participating in the training activities, training participants understand and have skills in using Android-based marketplace applications. The training on using IT aims to encourage Sipatuo village tourism businesses to grow and compete productively. Productive women will be able to maintain the village's food security. Participants who attend are generally business actors who do not yet have digital skills to market their products. After participating in training and mentoring, these business actors have increased their skills in using applications. The mentoring provided can be sustainable, which is expected to have a significant impact on economic growth for the community and can support the achievement of SDGs 2030.

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REFERENCES

- Advocates for International Development. (2022). *SDG 5: gender equality. A legal guide*. Retrieved June 5th, 2024 from https://www.a4id.org/wp-content/uploads/2022/02/A4ID-SDG-Legal-Guide_Chapter-5.pdf
- Ahmed, M., Kumar, M., Ahmad, A., Khan, S., & Azeemi, I. (2024). Empowering women through tourism and financial development: empirical evidence from upper middle-income economies. *International Journal of Social Science & Entrepreneurship*, 4(1), 163–183. <https://doi.org/10.58661/ijssse.v4i1.252>
- Akanle, O., Kayode, D., & Abolade, I. (2022). Sustainable development goals (SDGs) and remittances in africa. *Cogent Social Sciences*, 8(1). <https://doi.org/10.1080/23311886.2022.2037811>
- Ali, A., Rasoolimanesh, S., & Cobanoglu, C. (2020). Technology in tourism and hospitality to achieve sustainable development goals (SDGs). *Journal of Hospitality and Tourism Technology*, 11(2), 177–181.
- Alisjahbana, A. S., & Murniningtyas, E. (2018). Tujuan pembangunan berkelanjutan di Indonesia: konsep target dan strategi implementasi. In *Umpad Press* (2nd ed.). Unpad Press. <https://doi.org/10.18356/9789210010788>
- BKKBN. (2024). *Profil Sipatuo*. BKKBN. Retrieved October 20th, 2024 from <https://kampungkb.bkkbn.go.id/kampung/38878/sipatuo>
- Buhalis, D., Leung, X. Y., Fan, D., Darcy, S., Chen, G., Xu, F., Wei-Han Tan, G., Nunkoo, R., & Farmaki, A. (2023). Tourism 2030 and the contibution to the sustainable development goals: the tourism review viewpoint. *Tourism Review*, 78(2), 293–313. <https://doi.org/10.1108/TR-04-2023-620>
- Ditta-Apichai, M., Gretzel, U., & Kattiyapornpong, U. (2024). Platform empowerment: Facebook's role in facilitating female micro-entrepreneurship in tourism. *Journal of Sustainable Tourism*, 32(3), 540–559. <https://doi.org/10.1080/09669582.2023.2215479>
- Dwyer, L. (2022). Tourism contribution to the SDGs: applying a well-being lens. *European Journal of Tourism Research*, 32(2022), 1–20. <https://doi.org/10.54055/ejtr.v32i.2500>
- Efthymiadou, F., & Farmaki, A. (2024). Women empowerment in peer-to-peer accommodation settings: perspectives of female Airbnb hosts. *Journal of Sustainable Tourism*, 32(8), 1686–1707. <https://doi.org/10.1080/09669582.2023.2262782>
- Elgin, C., & Elveren, A. Y. (2024). Unpacking the economic impact of tourism: A multidimensional approach to sustainable development. *Journal of Cleaner Production*, 478(September). <https://doi.org/10.1016/j.jclepro.2024.143947>
- Fukuda-Parr, S., Weiss, T. G., & Wilkinson, R. (2022). Sustainable development goals (SDGs) and the promise of a transformative agenda. *CDP Policy Review*, August(11).
- Gantner, O., & Quan, A. (2024). *Women 's economic empowerment strategy* (Issue 3). Retrieved October 20th, 2024 from <https://www.unwomen.org/sites/default/files/2024-03/un-women-womens-economic-empowerment-strategy-en.pdf>

- Kabeer, N. (1999). Resources, agency, achievements: reflections on the measurement of women's empowerment. *Development and Change*, 30(May), 435–464.
- Katsekor, J. T., Adom-Asamoah, G., & Morgan, A. K. (2024). Economic empowerment among female shea actors: the case of Savelugu District, Ghana. *Cogent Social Sciences*, 10(1). <https://doi.org/10.1080/23311886.2023.2299105>
- Khoo, C., Yang, E. C. L., Tan, R. Y. Y., Alonso-Vazquez, M., Ricaurte-Quijano, C., Pécot, M., & Barahona-Canales, D. (2024). Opportunities and challenges of digital competencies for women tourism entrepreneurs in Latin America: a gendered perspective. *Journal of Sustainable Tourism*, 32(3), 519–539. <https://doi.org/10.1080/09669582.2023.2189622>
- Kipchirchir, C., Misiko, A. J., & Kiplangat, D. C. (2024). Assessment of socio-economic gender issues affecting women's participation in alpine tourism: a case study of Mt. Kenya National Park. *African Journal of Tourism and Hospitality Management*, 3(1), 14–29. <https://doi.org/10.37284/ajthm.3.1.1755>
- Kusumastuti, H., Pranita, D., Viendyasari, M., Rasul, M. S., & Sarjana, S. (2024). Leveraging local value in a post-smart tourism village to encourage sustainable tourism. *Sustainability (Switzerland)*, 16(2). <https://doi.org/10.3390/su16020873>
- Labadi, S. (2022). Gender equality and the empowerment of women. In *Rethinking Heritage for Sustainable Development* (pp. 135–163). UCL Press. <https://doi.org/10.2307/j.ctv280b66f.11>
- Liu, L. W., Wang, C. C., Pahrudin, P., Royanow, A. F., Lu, C., & Rahadi, I. (2023). Does virtual tourism influence tourist visit intention on actual attraction? A study from tourist behavior in Indonesia. *Cogent Social Sciences*, 9(1). <https://doi.org/10.1080/23311886.2023.2240052>
- Pakuna, H. B., Hunowu, M. A., Datumula, S., Sunarsi, D., Wahyuni, Tamu, Y., & Daulay, P. (2024). Patterns of women empowerment in rural Indonesia: the role of quran completion tradition. *Cogent Social Sciences*, 10(1). <https://doi.org/10.1080/23311886.2024.2356915>
- Pécot, M., Ricaurte-Quijano, C., Khoo, C., Vázquez, M. A., Barahona-Canales, D., Ling Yang, E. C., & Tan, R. (2024). From empowering women to being empowered by women: A gendered social innovation framework for tourism-led development initiatives. *Tourism Management*, 102(December 2023). <https://doi.org/10.1016/j.tourman.2024.104883>
- Pemerintah Desa Sipatuo. (2022). *Rencana pembangunan jangka menengah desa (RPJMDES) periode 2022-2027* (p. 152). Retrieved October 20th, 2024 from <https://sipatuo.sitemandesa.com/publikasi/detail/36>
- Pemerintah Desa Sipatuo. (2023). *Rencana kerja pemerintah desa (RKPDDES) tahun anggaran 2023* (p. 110). Retrieved October 20th, 2024 from <https://sipatuo.sitemandesa.com/publikasi/detail/34>
- Pradhipta, R. M. W. A., Pusparani, & Nofiyanti, F. (2021). Penta helix strategy in rural tourism (case study of tugu utara bogor). *E3S Web of Conferences*, 232, 1–9. <https://doi.org/10.1051/e3sconf/202123204010>
- Prayitno, G., Auliah, A., Ari, I. R. D., Effendi, A., Hayat, A., Delisa, A., Siankwilimba, E., & Hiddlestone-Mumford, J. (2023). Social capital for sustainable tourism development in Indonesia. *Cogent Social Sciences*, 10(1). <https://doi.org/10.1080/23311886.2023.2293310>
- Sachs, J. D. (2012). From millennium development goals to sustainable development goals. *The Lancet*, 379(9832), 2206–2211. [https://doi.org/10.1016/S0140-6736\(12\)60685-0](https://doi.org/10.1016/S0140-6736(12)60685-0)
- Scheyvens, R., & Cheer, J. M. (2022). Tourism, the SDGs and partnerships. *Journal of Sustainable Tourism*, 30(10), 2271–2281. <https://doi.org/10.1080/09669582.2021.1982953>
- Sen, A. (1999). Development as freedom. In J. T. Roberts, A. B. Hite, & N. Chorev (Eds.), *The Globalization and Development Reader: Perspective on Development and Global Change* (Second Edi). Wi.
- Teshome, E., Dereje, M., & Asfaw, Y. (2022). Potentials, challenges and economic contributions of tourism resources in the South Achefer district, Ethiopia. *Cogent Social Sciences*, 8(1). <https://doi.org/10.1080/23311886.2022.2041290>
- UN Women. (2018). Turning promises into action: gender equality in the 2030 agenda for sustainable development. In *United Nations*. Retrieved October 20th, 2024 from <https://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2018/sdg-report-gender-equality-in-the-2030-agenda-for-sustainable-development-2018-en.pdf?la=en&vs=4332>
- UN Women. (2024). *Placing Gender Equality At the Heart of the Global Digital Compact of the Sixty-Seventh Session of the Commission on the Status of Women*. Retrieved October 20th, 2024 from <https://www.unwomen.org/en/digital-library/publications/2024/03/placing-gender-equality-at-the-heart-of-the-global-digital-compact>.

- UN Women, UNDP, UNFPA, UNICEF, & WFP. (2024). *Are we getting there ? A Synthesis of UN system evaluations of SDG 5*. Retrieved October 20th, 2024 from <https://www.unwomen.org/sites/default/files/2024-05/are-we-getting-there-a-synthesis-of-un-system-evaluations-of-sdg-5-en.pdf>
- WTTC. (2024). *Indonesia's booming travel & tourism to support more than 12.5 million jobs*. World Travel and Tourism Council. Retrieved October 20th, 2024 from <https://www.breakingtravelnews.com/news/article/indonesias-booming-travel-tourism-to-support-more-than-12.5-million-jobs/>
- Yasir, Y., Firzal, Y., Sulistyani, A., & Yesicha, C. (2021). Penta helix communication model through community based tourism (CBT) for tourism village development in Koto Sentajo, Riau, Indonesia. *Geojournal of Tourism and Geosites* , 37(3), 851–860. <https://doi.org/10.30892/GTG.37316-718>
- Ying, L., Ziyi, Q., Shizhuan, H., Yan, L., & Tongqian, Z. (2024). The development of digital tourism in China. *Cogent Social Sciences*, 10(1). <https://doi.org/10.1080/23311886.2024.2347013>



Training in making MP-ASI menus and nutritious meals in Glodogan, Klaten to prevent stunting

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-10-31 Revised: 2024-11-15 Accepted: 2025-03-02 Published: 2025-04-09 Keywords Stunting MP-ASI snack Socialization Training	Stunting in children is still a problem in Klaten. Even though it is not the highest in Central Java, this is still a concern. The first two years of life (0-24 months) are a critical period for a child's growth and development. This period offers the most significant opportunities to optimize intellectual and physical development. The role of parents is very much needed in this case, especially the role of a mother. A mother should possess the skills to select high-quality and appropriate quantities of food and to prepare nutritious and balanced meals that meet the nutritional needs of her toddler. This community service was implemented to target audiences interested in education on fulfilling complementary food for breast milk (MP ASI) daily nutrition for 20 mothers who have 6 – 24 months old baby. This community service was conducted in Glodogan Village, South Klaten District, Klaten. The success of the program is carried out by giving pretests and posttests to participants. These two tests prove that participants understand better after socialization. The results showed that there was increasing average score of questionnaires from 48.75 to 96.25. The contribution of this service is MP-ASI products that are quality, clean, and safe for consumption and marketing because MPASI is made by ourselves. Therefore, we can be sure of its cleanliness from the ingredients used to make it safer for children to consume. This activity will continue in collaboration with PKK mothers through Posyandu activities. This is a form of ongoing assistance and can increase cooperation with partners.
Kata Kunci Stunting Kudapan MP-ASI Sosialisasi Pelatihan	Pelatihan pembuatan menu MP-ASI dan makanan bernutrisi di Glodogan, Klaten untuk mencegah stunting. Stunting pada anak-anak masih menjadi permasalahan di Kabupaten Klaten. Meskipun bukan menduduki peringkat teratas di Jawa Tengah, hal tersebut tetap menjadi perhatian. Dalam dua tahun pertama kehidupan (0-24 bulan) adalah periode kritis bagi tumbuh kembang anak. Periode ini mempunyai dampak paling berpengaruh untuk mengoptimalkan perkembangan intelektual dan fisik anak. Peran orang tua sangat dibutuhkan dalam hal ini, terutama peran seorang ibu. Seorang ibu harus memiliki ketrampilan untuk memilih makanan yang berkualitas tinggi dan jumlah yang tepat serta menyiapkan makanan bergizi seimbang yang memenuhi gizi balitanya. Pengabdian masyarakat ini dilaksanakan untuk menargetkan peserta yang tertarik dengan edukasi pemenuhan makanan pendamping untuk ASI (MP ASI) bagi ibu yang memiliki bayi berusia 6 – 24 bulan. Lokasi pengabdian ini berada di Desa Glodogan, Kecamatan Klaten Selatan, Kabupaten Klaten. Keberhasilan program dilakukan dengan memberikan pretest dan posttest kepada peserta. Dari tes tersebut terlihat bahwa pemahaman peserta meningkat setelah sosialisasi. Dari hasil tes menunjukkan bahwa ada rata-rata peningkatan skor dari 48,75 menjadi 96,25. Produk dari pengabdian ini adalah MP-ASI yang berkualitas, bersih, dan aman untuk dikonsumsi maupun dipasarkan mengingat produk MP-ASI ini dimasak sendiri. Maka dari itu, kita dapat yakin dengan kebersihan dari bahan – bahan yang digunakan membuat produk ini lebih aman untuk dikonsumsi ana-anak. Kegiatan ini akan terus berlanjut dengan bekerja sama bersama ibu-ibu PKK melalui kegiatan Posyandu. Hal ini merupakan bentuk pendampingan yang berkelanjutan dan upaya peningkatan kerja sama dengan mitra. Copyright © 2025, Puyanda, et al This is an open access article under the CC-BY-SA license

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<https://doi.org/10.22219/jcse.v6i1.37204>

INTRODUCTION

According to the World Health Organization, Indonesia is one of 17 countries grappling with the triple burden of malnutrition among children under five: stunting (37.2%), wasting (12.1%), and obesity (11.1%). Consequently, Indonesia faces persistent nutritional challenges, particularly stunting and undernutrition in young children. Despite a 6.4% decline in stunting prevalence between 2007 and 2013, with rates of 11.5% for severe stunting and 19.3% for moderate stunting in 2018 (Risksedas), progress remains insufficient to meet the Indonesian Ministry of Health's target of 14% by 2024 (Bagaray et al., 2020). This highlights the ongoing need for intensified efforts to address malnutrition in Indonesia.

Stunting is a serious health issue in Indonesia, including in Klaten Regency. It is a condition in which children experience stunted growth due to chronic malnutrition, recurrent infections, and inadequate psychosocial stimulation (Ministry of Health of the Republic of Indonesia, 2023). In Klaten Regency, the prevalence of stunting remains a significant challenge that requires special attention from various stakeholders (Marliana et al., 2023).

According to recent data, by 2023, the frequency of stunting in Klaten Regency is expected to reach 14.65%. Although this rate is lower than in prior years, it is still well below the government's goal. By 2024, the Klaten District Government hopes to bring the stunting rate down to 11% (Kominfo Klaten, 2023). This goal is consistent with governmental initiatives to bring Indonesia's stunting prevalence down to less than 14% by 2024 (Sanggalorang et al., 2024). As a result, Klaten should be a priority for intensive counseling efforts.

Nutrition plays a crucial role in the growth and development of children (Mayar & Astuti, 2021). The primary goal of providing adequate nutrition is to ensure optimal growth and development. In infants and children, nutritional deficiencies can lead to impaired growth and development, which, if not addressed early, can have lasting consequences for adulthood (Lestari et al., 2014).

The first two years of life (0-24 months) represent a critical period for child growth and development. This period offers the most significant opportunity for optimizing intellectual and physical development. Achieving optimal growth and development during this crucial window hinges on providing children with adequate nutrition that meets their specific needs (Mirania & Louis, 2021).

According to the World Health Organization (WHO), in 2020, Indonesia's exclusive breastfeeding rates were suboptimal. Only half of infants under six months receive exclusive breastfeeding, and a mere five percent continue breastfeeding until 23 months of age. This indicates that many Indonesian children are not receiving the optimal nutrition required during the crucial first two years of life. Furthermore, over 40 percent of infants are introduced to complementary foods prematurely, before reaching six months old, and these foods often lack the essential nutrients needed for healthy growth and development.

Complementary feeding, or MP-ASI, refers to introducing nutrient-rich foods and beverages to infants older than six months to supplement breast milk and meet their evolving nutritional needs (Apriliani et al., 2023). This practice is crucial because breast milk alone can only satisfy two-thirds of an infant's dietary requirements between 6 and 9 months and only half of their needs between 9 and 12 months. Therefore, complementary feeding is vital in supporting healthy growth and development during this critical period (Lestari et al., 2014).

In general, complementary foods can be categorized into factory-processed complementary foods, often called commercial complementary, home-prepared, or local complementary foods. The provision of local complementary foods in several developing countries has not been able to provide the adequate energy and micronutrient supply required for children's daily needs (Triana et al., 2019). Olivia's research found that infants' most common complementary foods were locally prepared. Among 6- to 24-month-old infants, rice (25.9%), fruits (17.2%), eggs (15.5%), fish (13.8%), vegetables (10.3%), tempeh (8.6%), rice porridge (5.2%), and meat (2%) were the most frequently provided (Mangkat et al., 2016).

Complementary feeding is transitioning from a solely milk-based diet to semi-solid foods. The introduction and provision of complementary foods should be gradual in terms of consistency and quantity to accommodate the infant's digestive capabilities. Appropriate complementary feeding fulfills the infant's nutritional needs, stimulates feeding skills, and fosters self-confidence (Mufida et al., 2015). Widyawati et al. (2016) found that initiating complementary feeding at an inappropriate age increases the risk of wasting by 1.2 times compared to infants who begin complementary feeding at the recommended age.

The successful implementation of complementary feeding (MP-ASI) involves carefully considering several key factors: the appropriate age of introduction, the selection of suitable food types, the frequency and portion size of meals, and the feeding method during the initial stages. Properly managed complementary feeding ensures that infants receive adequate nutrition and plays a crucial role in fostering their eating skills and developing their self-confidence (Lestari et al., 2014). The introduction of complementary foods should prioritize variety, progressing gradually from thin porridges to thicker consistencies, fruit juices, fresh fruits, mashed foods, soft foods, and solid foods. This approach ensures exposure to diverse flavors and textures, promoting acceptance and facilitating the development of eating skills (Nurbaeti & Syaputra, 2020).

Beyond the introduction of complementary feeding, a balanced diet is crucial in preventing stunting (Utami & Suryana, 2022). A balanced diet, essential for child growth and development, refers to daily food intake that contains a variety of nutrients in appropriate amounts, considering food diversity, physical activity, a clean lifestyle, and regular weight monitoring to maintain a healthy weight and prevent nutritional problems (PERMENKES, 2014). The animal-based proteins are important in preventing stunting. Otherwise, toddlers need to consume adequate amounts of high-quality protein snacks, as animal proteins contain more essential amino acids than plant-based sources.

Snacks are light meals consumed between main meals, temporarily alleviating hunger, providing a slight energy boost, and offering a pleasurable eating experience (Putri et al., 2020). Nutritious snacks are light meals that fulfill the body's nutritional needs. These snacks must adhere to specific criteria, including being hygienic, providing sufficient dietary value, and not being limited by cost or taste preferences (Salsabilla, 2017). Nutritious snacks are rich in vitamins, minerals, and dietary fiber, which act as antioxidants that combat harmful substances in the body (Irawati et al., 2024).

Inadequate feeding practices contribute to malnutrition in several developing countries grappling with nutritional deficiencies (Sambo et al., 2020). The feeding patterns provided to infants significantly influence their growth process, as the nutritional intake contains essential nutrients for growth, health, and cognitive development (Noviyanti et al., 2020). Addressing nutritional status in children is a fundamental aspect of fulfilling children's basic needs for care, love, and education (Rachmawati et al., 2016). Improper feeding practices are associated with severe infant wasting (Subarkah et al., 2016).

The mother is the primary caregiver, and most influences an infant's growth and development. A child's dietary patterns are strongly influenced by those of their family. Early establishment of healthy eating habits is crucial for optimal child development (Robert et al., 2022). A mother should possess the skills to select high-quality and appropriate quantities of food and to prepare nutritious and balanced meals that meet the nutritional needs of her toddler. These culinary skills can be acquired through frequent participation in food demonstration activities (Syah et al., 2024). This project supports one of the United Nation programs, i.e Sustainable Development Goals (SDGs) number 3, it is ensuring healthy lives and promoting well-being for all at all ages (sdgs.un.org).

METHOD

This community service was implemented to target audiences interested in education on fulfilling daily nutrition for 20 mothers who have 6 – 24 months old baby. This activity involved PKK women and Glodogan Village officials, South Klaten District, Klaten. The implementation of this activity is carried out through several stages, namely: 1) Observation and request for willingness to cooperate with partners; 2) Formulation of Solution Steps; 3) Socialization; 4) Focus Group Discussion (FGD); 5) Evaluation (Rahmawati et al., 2024). Evaluation is carried out by giving pretests and posttests to participants. From this test, the difference in participants' understanding of M-PASI before and after the service was carried out. This is done to get feedback from participants.

Community service was conducted in Glodogan Village, South Klaten District, Klaten. The village's location is presented in Figure 1, while Figure 2 is a photo of the village office. Klaten is one of Central Java Province's regencies in the southern part of the province. Klaten district comprises 26 sub-districts, which are further subdivided into 401 villages.



Figure 1. The strategic location of Glodogan Village



Figure 2. Glodogan Village Office

RESULTS AND DISCUSSION

This service activity was given the theme "Socialization and Practice of MP-ASI Menus and Nutritious Snacks to Prevent Stunting". The following are the details of this activity:

Observation

In this activity, the Slamet Riyadi University FATIPA service team visited the village office on July 4, 2024, to meet the village head and integrated health post chairman to make observations regarding stunting cases in Glodogan Village, Klaten. This observation activity aims to identify problems, needs, and obstacles experienced by the village. From this observation, the results obtained are that there are still children who experience stunting and mothers who still do not understand the importance of giving MP-ASI to children.

Socialization

The UNISRI FATIPA Service Team solved this problem by holding outreach activities and practicing making MP-ASI and nutritious snacks to prevent stunting. Apart from that, it also serves as a forum to educate and provide insight to the public about the importance of giving MP-ASI to children.



Figure 3. Socialization in Glodogan Village, Klaten: (a) presentation from the community service team; (b) Practice of Making MP-ASI; and (c) Gathering with the Glodogan Village Community

Socialization and Training

The socialization started with education about the importance of giving additional food to babies after six months. According Fitrianiingsih et al (2022), infants or children aged 6-24 months need complementary food for breast milk (MP-ASI) to meet their nutritional needs. In the socialization was provided some videos of making MP ASI to make participants clear about how to make MP ASI menus simple but nutritious. After socialization, the community service continued with training to make Samosa as a MP ASI's snack. Samosa was made with various fillings, in example vegetables, meat, fish, even shrimp and wrapped with thin pastry (Gupta et al, 2024). Before consuming this cuisine, it is fried until the pastry texture crispy. The crispy texture of Samosa sometimes increases the increasing enthusiasm children to eat. In the training, the participants can practice directly to prepare health samosa for their children (Figure 3 (b)).

The implementation of this socialization can be considered very effective. This can be seen from the enthusiasm of service participants in the partner environment, starting from their activeness in asking questions and making products. This activity is hoped to help reduce stunting and malnutrition rates in Glodogan Village, Klaten. Not only for themselves it is hoped that mothers can also share their knowledge with the community so that many people can be known and can educate the wider community. This activity closed with a posttest and continued with a group photo.

Evaluation

All the participants in Glodogan Village, Klaten, welcomed this community service activity. From this activity, the following were obtained: (1) Increasing the knowledge of mothers in Glodogan Village, Klaten, regarding the importance of providing MP-ASI to support children's growth. (2) Provide references for MP-ASI recipes and nutritious snacks that children like and have high nutritional value. (3) Increasing public awareness of the dangers of malnutrition and stunting in children. (4) Provide education on using existing food ingredients to make MP-ASI and nutritious snacks. (5) Train participants to make MP-ASI and nutritious snacks independently so that they can pay attention to cleanliness and nutritional content tailored to their children's needs.

The knowledge of the participants in Glodogan Village, Klaten, was measured qualitatively from the discussion and question and answer process that took place after providing material and practice directly. Apart from that, it is also assessed through online tests before and after the event starts. Based on the assessment results show that mothers, as partners in this service event, feel that this activity is beneficial and can be continued.

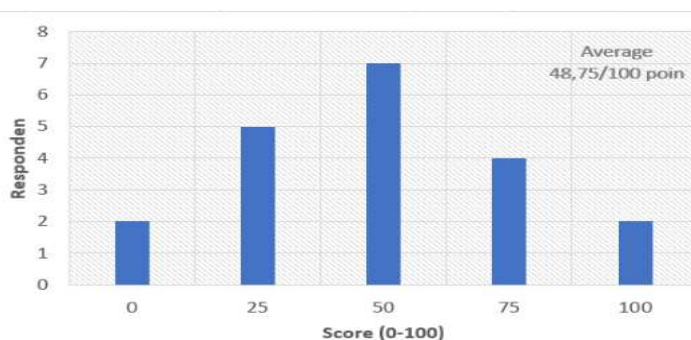


Figure 4. Questionnaire results before service activities are carried out.

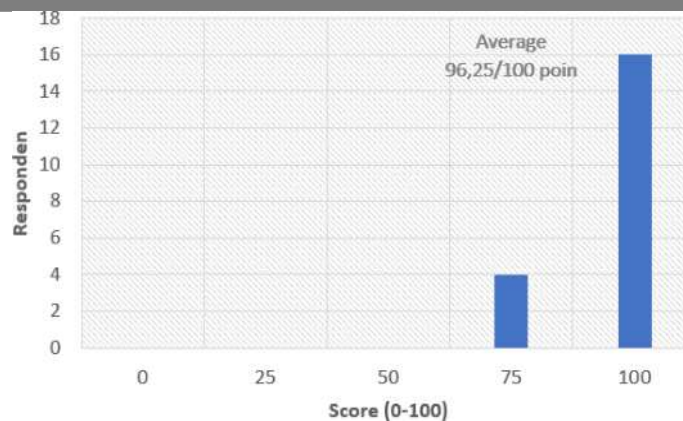


Figure 5. Questionnaire results after community service activities.

Based on the questions we shared online with mothers in Glodogan Village before the event started, there were still many who did not understand what stunting was or the correct provision of MP-ASI. The average value of correct answers only showed 48.75. This score was small because it did not reach 50% of the perfect score. After this service activity, a posttest was conducted, and it turned out that many of the answers were answered correctly, with an average of 96.25. This value has increased rapidly compared to before this activity was held. As a follow-up to this activity, there will be assistance in providing M-PASI and nutritious snacks for children under five in Glodogan Village, South Klaten District, Klaten in collaboration with PKK mothers through posyandu activities. This is a form of ongoing assistance and can increase cooperation with partners.

CONCLUSION

The conclusions obtained from the results of this service activity are; (1) The participation of mothers who have 6-24 months old baby in taking part in this community service activity was very enthusiastic; this was proven by the participant attendance level reaching 100% (20 target community participants, namely mothers); (2) This activity can provide information about the importance of giving MPASI to children as a way to meet nutritional needs for children's growth and development. The presence of mothers in Glodogan Village, South Klaten District, Klaten, is the right target for this service. It's hoped that participants can provide the best nutrition for their children through MP-ASI needs to prevent malnutrition and stunting. The contribution of this service is the production of MP-ASI products that are of high quality, clean, and safe for consumption and marketing because the MP-ASI is made by us. We can be sure of its cleanliness and the ingredients used to make it safer for children to consume.

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REFERENCES

- Apriliani, A. P., Arifuddin, D., Nesyana Nurmadilla, Fadli Ananda, & Haidir Bima, I. (2023). Analisis karakteristik dan pola pemberian MPASI anak usia 6-24 bulan di Puskesmas Soroako. *Fakumi Medical Journal: Jurnal Mahasiswa Kedokteran*, 3(7), 461–470. <https://doi.org/10.33096/fmj.v3i7.270>
- Bagaray, E. F., Langi, F. L. F. G., & Posangi, J. (2020). Determinan pemberian ASI eksklusif 24 jam terakhir pada bayi umur 0 sampai 6 bulan di Indonesia. *KESMAS: Jurnal Kesehatan Masyarakat Universitas Sam Ratulangi*, 9(4), 48-62. <https://doi.org/10.35790/kesmas.v9i4.29484>
- Baunsele, A. B., Faofeto, A., Missa, H., Djalo, A., Ndukung, S., Nadut, A., & Sooai, A. G. (2023). Sosialisasi pola hidup bersih dan sehat dalam upaya pencegahan stunting di Desa Manleten Kabupaten Belu. *Aptekmas Jurnal Pengabdian pada Masyarakat. Aptekmas Jurnal Pengabdian pada Masyarakat*, 6(1), 31- 38. <https://doi.org/10.36257/apts.v6i1.4839>
- Fitriyaningsih, E., Mulyanti, N. S., & Ahmad, A. (2023). Nutrition education about making complete food with breast milk (MP-ASI) using local food in Simpang Tiga District, Aceh Besar District. *Jurnal PADE:*

- Pengabmas dan Edukasi*. 5(1), 28- 33. <http://dx.doi.org/10.30867/pade.v5i1.1097>
- Gupta, A., Sandhu, G., Bagga, P., Priyadarshi, S., & Gill, R. (2024). A culinary of India "Samosa" and its economics and potential impact Indian economy and the World Food Market, through diversification. *International Research Journal on Advanced Engineering and Management*. 9(2), 2796-2803. <https://doi.org/10.47392/IRJAEM.2024.0407>
- Kominfo Klaten. (2023, September 11). The regent targets stunting cases to decrease to 11 percent next year. *Klatenkab.go.id*. Retrieved from <https://klatenkab.go.id/bupati-targetkan-kasus-stunting-turun-di-angka-11-persen-tahun-depan/>
- Lestari, M. U., Lubis, G., & Pertiwi, D. (2014). Hubungan Pemberian makanan pendamping asi (MP-ASI) dengan status gizi anak usia 1-3 tahun di Kota Padang tahun 2012. *Jurnal Kesehatan Andalas*, 3(2). <https://doi.org/10.25077/jka.v3i2.83>
- Lestiarini, S., & Sulistyorini, Y. (2020). Perilaku ibu pada pemberian makanan pendamping ASI (MPASI) di Kelurahan Pegirian. *Jurnal Promkes: The Indonesian Journal of Health Promotion and Health Education*, 8(1), 1–11. <https://doi.org/10.20473/jpk.V8.I1.2020.1-11>
- Kementerian Kesehatan Republik Indonesia. (2014). *Peraturan Menteri Kesehatan Nomor 41 Tahun 2014 tentang Pedoman Gizi Seimbang*. Jakarta: Kementerian Kesehatan.
- Mangkat, O., Mayulu, N., & Kawengian, S. (2016). Gambaran pemberian makanan pendamping ASI anak usia 6-24 bulan di Desa Mopusi Kecamatan Lolayan Kabupaten Bolaang Mongondow Induk. *Jurnal e-Biomedik (eBm)*, 4(2), 3-4.
- Mayar, F., & Astuti, Y. (2021). Peran gizi terhadap pertumbuhan dan perkembangan anak usia dini. *Jurnal Pendidikan Tambusai*, 5(3), 9695-9704.
- Merliana, T. V., Karjoko, L., & Nugroho, A. (2023). Peran Dinas Kesehatan Kabupaten Klaten dalam Pencegahan Stunting. *Jurnal Discrete: Jurnal Bagian Hukum Administrasi Negara*, 4(2).
- Ministry of Health of the Republic of Indonesia. (2023). *Understanding Stunting*. yankes.kemkes.go.id.
- Mirania, A. N., & Louis, S. (2021). Hubungan pola pemberian makanan pendamping ASI (MP-ASI) dengan status gizi anak usia 6-24 bulan. *Jurnal Ilmiah STIKES Citra Delima Bangka Belitung*, 5(1), 45-52.
- Mufida, L., Widyarningsih, T. D., & Maligan, J. M. (2015). Prinsip dasar makanan pendamping air susu ibu (MP-ASI) untuk bayi 6-24 bulan: Kajian pustaka. *Jurnal Pangan dan Agroindustri*, 3(4), 1646-1651.
- Noviyanti, L. A., Rachmawati, D. A., & Sutejo, I. R. (2020). Analisis faktor-faktor yang mempengaruhi pola pemberian makan balita di Puskesmas Kencong. *Journal of Agromedicine and Medical Sciences*, 6(1), 14-18. <http://repository.unej.ac.id/handle/123456789/99483>
- Putri, R. M., Dewi, N., & Maemunah, N. (2020). Mothers' behaviour on the provision of snack which risk of children's health. *Jurnal Keperawatan*, 11(1), 59–67. <https://doi.org/10.22219/jk.v11i1.9653>
- Rachmawati, P. D., Ranuh, R., & Arief, Y. (2016). Perilaku ibu dalam pemenuhan kebutuhan asah, asih dan asuh anak leukemia. *Jurnal NERS*, 11(1), 63-72. <https://doi.org/10.20473/jn.v11i12016.63-72>
- Rahmawati, F. D., Maulana, A. R., Maharani, C. T. P., Rini, D. S. P., Richardo, K. M., & Puyanda, I. R. (2024). The effort to prevent stunting by training in making vegetable nuggets at Gombang, Boyolali. *Journal of Community Service and Empowerment*, 5(2), 429–434. <https://doi.org/10.22219/jcse.v5i2.27491>
- Robert, D., Junus, R., Isima, C. U., SKereh, P., Sahelangi, O., & Gagu, Politeknik Kesehatan Kementerian Kesehatan Manado, N. (2022). Demontrasi pembuatan nugget ikan dan penyuluhan gizi guna optimalisasi pola asuh gizi dan keterampilan ibu dalam pemilihan serta pengolahan bahan pangan Desa Kalasey Dua Kecamatan Mandolang Kabupaten Minahasa. In E-PROSIDING Seminar Nasional 2022, 1, 139–150. Retrieved from <https://mail.ejurnal.poltekkes-manado.ac.id/index.php/eprosiding2022/article/view/1691>
- Sanggalorang, Y., Sebayang, F. A. A., Malonda, N. S. H., & Rumayar, A. A. (2024). Insights into childhood malnutrition: An analysis on food vulnerability and stunting using 2021 Indonesian nutritional status survey data. *Media Gizi Indonesia (National Nutrition Journal)*, 19(3), 282-290. <https://doi.org/10.20473/mgi.v19i3.282-290>
- Sambo, M., Ciantasari, F., & Maria, G. (2020). Hubungan pola makan dengan status gizi pada anak usia prasekolah. *Jurnal Ilmiah Kesehatan Sandi Husada*, 11(1), 423-429. <https://doi.org/10.35816/jiskh.v11i1.316>
- Sustainable Development. Department of Economic and Social Affairs. Accessed at 16.54 April 3, 2025. <https://sdgs.un.org/goals/goal3>
- Subarkah, T., Nursalam, & Rachmawati. (2016). Pola pemberian makan terhadap peningkatan status gizi pada anak usia 1–3 tahun. *Jurnal INJEC*, 1(2), 146-154. <https://repository.unair.ac.id/50607/>

- Syah, J., Abdullah, A. D., Fauziah, F., Rahmaniah, R., Sari, R. M., & Zakiah, N. (2024). Demonstrasi dan peningkatan keterampilan ibu dalam pengolahan makanan kudapan pendamping ASI berbasis pangan lokal. *Jurnal Abmas Negeri (JAGRI)*, 5(1), 69–76. <https://doi.org/10.36590/jagri.v5i1.882>
- Siti Nurbaeti, T., & Maulana Syaputra, E. (2020). Praktek pemberian MP ASI yang baik dan benar di Desa Balongan. *Abdi Wiralodra : Jurnal Pengabdian Kepada Masyarakat*, 2(1), 39–45. <https://doi.org/10.31943/abdi.v2i1.23>
- Triana, A., Maita, L., & Liva, L. (2019). Pengaruh pemberian MPASI pabrikan dan MPASI lokal terhadap status gizi bayi. *Jurnal Media Kesehatan*, 12(1), 041.
- Undol, C., Damopolii, R., Akbar, H., Sarman. (2022). Tradisi papah makanan untuk bayi di wilayah Kota Kotamobaga. *Jurnal Keperawatan dan Kesehatan*. Vol. 5(1).
- UNICEF & World Health Organization. (2020). *World Breastfeeding Week: UNICEF and WHO call on the Government and stakeholders to support all breastfeeding mothers in Indonesia during COVID-19*. [Press release].
- Utami, N., & Suryana, D. (2022). Pelibatan lembaga pendidikan anak usia dini dalam pencegahan stunting. *Jurnal Pendidikan Tambusai*, 6(2), 13657–13561.
- Widdyawati, F., Febry, F., & Destriatania, S. (2016). Analisis pemberian MP-ASI dengan status gizi pada anak usia 12-24 bulan di wilayah kerja Puskesmas Lebung Batu Empat Lawang. *Jurnal Ilmu Kesehatan Masyarakat*, 7(2), 139-149.



Women's empowerment model in increasing economic independence at the community work training center (BLKK) of Lampung Province

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-12-08 Revised: 2025-02-23 Accepted: 2025-03-02 Published: 2025-04-10 Keywords Economic Independence Life Skill Women Empowerment	This study explores the model of women's empowerment based on life skills development to increase economic independence at the Lampung Community Work Training Center (BLKK). Through a life skills-based training program, this study analyzes women's empowerment in increasing economic independence in the Lampung Muslim community. Methodology This study uses a qualitative descriptive approach to understand the model of women's empowerment based on life skills development at the Community Work Training Center (BLKK) in Lampung Province. Data collection was carried out through participatory observation, in-depth interviews, and Focus Group Discussion (FGD) Primary Data Sources Using a purposive sampling technique with Criteria from a Total Number of 73 used according to the Criteria of 11 people, namely 6 participants, 2 instructors, and 2 heads of centers, namely BLKK Pesawaran and BLKK East Lampung and 1 Head of SVP of the Ministry of Manpower Korwil Lampung. In addition, documentation in the form of training modules, activity reports, and evaluation notes is also used as secondary data. The data collected was analyzed using Miles and Huberman's theory, which included data reduction, data presentation, and verification followed by Triangulation. The research data lasted for 3 months, ensuring that the process of empowering women through technical skills training in clothing manufacturing and life skills could be observed comprehensively. The theories used are deliberative empowerment, empowerment of the Madani community, principles of Muslim women's rights, life skills theory, and human capital management (HCM) concept. The results of the study indicate that the deliberative empowerment model at BLKK Lampung is based on deliberation, cooperation, and active participation, supporting the development of participants' life skills, especially sewing, hard skills and communication soft skills, and self-confidence. The application of the principle of women's rights in Islam encourages equality and empowerment in social, economic, and spiritual aspects. The integration of human capital includes increasing human, social, and organizational capital, enriched with Islamic values, providing a comprehensive impact on the economic independence and welfare of participants.
Kata Kunci Kemandirian Ekonomi Keterampilan Hidup Pemberdayaan Perempuan	Model pemberdayaan perempuan dalam meningkatkan kemandirian ekonomi di Balai Latihan Kerja Komunitas (BLKK) Provinsi Lampung. Pengabdian ini mengeksplorasi model pemberdayaan perempuan berbasis pengembangan life skills dalam upaya meningkatkan kemandirian ekonomi di Balai Latihan Kerja Komunitas (BLKK) Lampung. Melalui program pelatihan berbasis life skills, penelitian ini berupaya menganalisis pemberdayaan perempuan dalam meningkatkan kemandirian ekonomi di komunitas Muslim Lampung. Metodologi Penelitian ini menggunakan pendekatan deskriptif kualitatif dengan tujuan untuk memahami model pemberdayaan perempuan berbasis pengembangan life skills di Balai Latihan Kerja Komunitas (BLKK) di Provinsi Lampung. Pengumpulan data dilakukan melalui observasi partisipatif, wawancara mendalam, dan Focus Group Discussion (FGD) Sumber Data Primer Menggunakan teknik purposive sampling dengan Kriteria dari Jumlah Total 73 digunakan sesuai Kriteria Berjumlah 11 Orang yaitu 6 peserta, 2 instruktur, dan 2 kepala balai, yaitu BLKK Pesawaran dan BLKK Lampung Timur dan 1 Kepala SVP Kemenaker Korwil Lampung. Selain itu, dokumentasi berupa modul pelatihan, laporan kegiatan, dan catatan evaluasi juga digunakan sebagai data sekunder. Data yang dikumpulkan dianalisis menggunakan teori Miles dan Huberman, yang meliputi reduksi data, penyajian data, dan verifikasi dilanjutkan dengan Trianggulasi. Data Penelitian berlangsung selama 3 bulan, memastikan proses pemberdayaan perempuan melalui pelatihan keterampilan teknis di bidang pembuatan pakaian dan life skills dapat diobservasi secara menyeluruh. Adapun teori yang dipakai teori pemberdayaan deliberatif, Pemberdayaan Masyarakat Madani, Prinsip-Prinsip Hak Perempuan Muslim, Teori Keterampilan Hidup, Konsep Manajemen Sumber daya manusia. Hasil penelitian menunjukkan bahwa model pemberdayaan deliberatif di BLKK Lampung berbasis musyawarah, kerja sama, dan partisipasi aktif, mendukung pengembangan life skills peserta, terutama hard skills menjahit dan soft skills komunikasi serta kepercayaan diri. Penerapan prinsip hak perempuan dalam Islam mendorong kesetaraan dan pemberdayaan dalam aspek sosial, ekonomi, dan spiritual. Integrasi human capital meliputi peningkatan modal manusia, sosial, dan organisasi, yang diperkaya nilai-nilai Islam, memberikan dampak komprehensif bagi kemandirian ekonomi dan kesejahteraan peserta.

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INTRODUCTION

Indonesia, with the fourth largest population in the world, is a developing country with great economic potential. However, Indonesia still faces two main challenges: unemployment and poverty. Central Bureau of Statistics data shows that the open unemployment rate reached 5.86% in February 2023 (BPS, 2023). More than 60% of Indonesia's population lives below the poverty line. As in Structuralist Theory, Gunnar Myrdal explained that an unfair and exploitative economic structure causes poverty in developing countries (Poltak, 2021). This inequality hinders economic growth and exacerbates poverty.

Global efforts by the State of Indonesia to overcome poverty have launched various cooperation programs and technical assistance. This affirms the commitment to the "people-centered, participatory, empowering, and sustainable" paradigm (Worldbank, 2024). This refers to the concept of the National Socio-Economic Survey conducted by the Central Statistics Agency (BPS) in calculating the poverty rate. Poverty measurement is carried out using the concept of the ability to meet basic needs (basic needs approach), which is equivalent to 2100 calories per person per day. Through this approach, poverty is seen as the economic inability to meet basic food and other needs measured in terms of spending. According to this approach, the poor are those who have an average monthly per capita expenditure less than the Poverty Line (GK). The Poverty Line is used to determine whether a person is poor or not (BPS, 2024).

Based on poverty data in Indonesia, Lampung Province is one of the regions that is in the high category, with a poverty rate of 60% (BPS, 2024). Although a downward trend is visible, inflation and access to education and health remain the main obstacles. In Lampung Province, the problem of poverty is one of the significant social challenges that continue to affect the welfare of its population. Although Lampung is one of the provinces with abundant natural resources, both in agriculture and other natural resources, this problem remains a major concern and a serious challenge in efforts to achieve inclusive and sustainable development. Poverty in Lampung Province is reflected in various economic and social indicators, including the high unemployment rate, especially among women and youth, and the lack of employment for the local population. Additionally, access to education and health is often limited in rural areas, which can exacerbate social and economic disparities (BPS, 2024).

The diverse geographical conditions in Lampung, ranging from the coast to the mountains, also affect access to resources and public services. Remote and isolated areas often face extra challenges in terms of basic infrastructure and transportation. This situation can limit economic opportunities and community development. Despite facing complex challenges, Lampung has succeeded in reducing poverty levels with continuous efforts in the form of increasing access to education, health, and economic opportunities for all levels of society. Lampung is expected to be able to move towards sustainable and inclusive development with the commitment and collaboration of various parties. It is hoped that every citizen can benefit from the progress achieved equally. The Community Work Training Center (BLKK) in Lampung is a strategic initiative to empower women with skills training and life skills. BLKK aims to create economically independent individuals and contribute to regional development. The following is data on the Percentage of Poor Population in Lampung Province 2021-2023:

Table 1. Percentage of Poor Population in Lampung Province 2021-2023

Region	2021	2022	2023
Lampung Province	1083,93	1002,41	970,67
East Lampung	159,79	149,12	148,26
Central Lampung	155,77	143,34	140,29
South Lampung	145,85	136,21	133,67
North Lampung	121,91	114,67	107,21
Bandar Lampung	98,76	90,51	87,08
Tanggamus	71,89	67,43	65,18
Pesawaran	68,31	63,17	59,29
Way Kanan	59,89	54,28	51,26
Tulang Bawang	44,53	39,19	37,83
Pringsewu	41,04	38,18	37,60
West Lampung	39,36	36,20	34,73
Pesisir Barat	23,23	21,85	21,45
Tulang Bawang Barat	23,03	20,72	20,32
Metro	15,32	13,68	12,80
Mesuji	15,24	13,88	13,71

Pesawaran Regency experiences significant fluctuations in poverty levels from year to year. As an area that was only established in 2007, Pesawaran Regency faces various development challenges, including poverty. As a newly established region, it struggles with inadequate infrastructure, limited industrial growth, and insufficient government resources to

address socio-economic disparities. Additionally, the administration is still in the process of strengthening governance systems and public service delivery, which can slow down poverty alleviation efforts. One of the primary factors influencing poverty in Pesawaran Regency is its dependence on the agricultural sector. While agriculture remains the backbone of the local economy, many farmers still rely on traditional and subsistence farming methods, which result in low productivity and income. Limited access to modern technology, irrigation systems, and agricultural extension services hampers the ability of farmers to maximize their yields. Seasonal employment in agriculture also contributes to economic instability, as many laborers experience periods of unemployment outside of harvest seasons. Fluctuations in market prices, climate change impacts, and land conversion for non-agricultural purposes further exacerbate the vulnerability of agricultural workers, making it difficult to achieve stable livelihoods.

Despite these challenges, there are potential opportunities for economic diversification that can help reduce poverty in the region. Developing agribusiness, agro-tourism, and small-scale processing industries can create new employment opportunities and add value to local agricultural products. Strengthening the fisheries and aquaculture sectors, given the region's coastal areas, can also contribute to economic growth. Encouraging entrepreneurship and investing in the creative economy, such as handicrafts and home industries, could help generate additional income sources for the local population. Furthermore, tourism development, leveraging Pesawaran's natural beauty and cultural heritage, can attract visitors and stimulate local businesses. To address educational and training deficiencies, the government should prioritize expanding vocational training centers, offering scholarships for underprivileged students, and integrating life skills education into school curricula. Enhancing digital literacy programs and promoting STEM (Science, Technology, Engineering, and Mathematics) education can help equip young people with skills relevant to the modern job market. Strengthening collaboration between educational institutions and industries can also ensure that training programs align with labor market demands. Partnerships with the private sector and NGOs play a crucial role in overcoming these socio-economic challenges. Private companies can invest in corporate social responsibility (CSR) initiatives, such as funding skill development programs and supporting microfinance schemes for small businesses. NGOs can contribute through community-based programs that provide mentoring, capacity-building, and advocacy for marginalized groups. By fostering strong partnerships, the region can leverage external resources and expertise to implement sustainable development programs that uplift the local economy and improve overall living standards.

Meanwhile, East Lampung also faces similar challenges in terms of poverty. Although there has been an increase in several aspects of development, it still experiences a high level of poverty. This area, which is rich in Natural Resources, has often not been able to maximize its economic potential optimally. Trends that are worrisome and require serious attention from the government, as well as various related parties, include economic instability and dependence on the traditional agricultural sector. In addition, the lack of access to education and skills training is also a major factor in the high poverty rate. The dynamics of poverty in this region can be examined more deeply using the basic needs approach, which is equivalent to 2100 calories per person per day, as measured by the Central Statistics Agency (BPS). The Open Unemployment Rate (TPT) in Lampung Province has peaked, reflecting economic challenges and the labor crisis. Local government responses include social assistance programs, incentives for small and medium-sized enterprises, and skills training to recover the economy and create jobs. Increased investment in key sectors, such as agriculture, manufacturing, and tourism, has brought significant positive results. Although TPT shows a decline, the quality of education, access to skills training, and support for entrepreneurship remain key points in long-term success. The following is the Open Unemployment Rate (TPT) in Lampung based on data:

Table 1.2 List Open Unemployment Rate (TPT) 2021-2023

Region	2021	2022	2023
Lampung Province	4,69	4,52	4,23
Tulang Bawang Barat	3,35	4,12	3,89
Tulang Bawang	4,10	3,52	3,46
Tanggamus	2,93	3,70	3,35
Pringsewu	4,85	4,77	4,66
Pesisir Barat	3,08	3,73	3,47
Pesawaran	4,19	5,06	4,76
Metro	5,00	4,34	3,60
Mesuji	3,42	3,22	2,46
North Lampung	6,14	6,15	5,73
East Lampung	3,05	3,30	3,09
Central Lampung	4,31	3,56	3,25
South Lampung	5,27	5,31	4,95
West Lampung	2,83	2,10	2,25
Bandar Lampung	8,85	7,91	7,43

Region	2021	2022	2023
Way Kanan	3,36	3,28	3,07

The Open Unemployment Rate (TPT) in Lampung from 2021 to 2023 shows significant variations. The increase in TPT in 2022 indicates a surge in unemployment that may be caused by economic instability and changes in the local economic structure. However, the decline in 2023 reflects the effectiveness of efforts to tackle unemployment. This trend emphasizes the importance of continuous monitoring and adjustment of unemployment reduction strategies that are responsive to labor market dynamics. A lot of unemployment will cause social problems in society. Unemployment is caused by an imbalance between the demand and supply of labor. In other words, unemployment occurs when the number of available workers exceeds the number of available job opportunities. This condition follows Law of the Republic of Indonesia Number 13 of 2003 concerning Manpower (Statute Book of the Republic of Indonesia Number 39 of 2003, Supplement to Statute Book of the Republic of Indonesia Number 3648) Chapter II Article 4 realizes equal distribution of employment opportunities and the provision of labor by the needs of national and regional development.

Equal distribution of employment opportunities and the provision of labor are currently closely related to gender. The gender approach emphasizes the equality of men and women and builds women in the context of independence and internal strength. This approach also highlights the importance of equality, as the role of women in the household can increase family income, build women's organizations, and increase public awareness. In the context of poverty, women with low incomes often face limitations in improving the welfare of their families. This is due to limited access to education and additional economic opportunities. Encouraging access to and control over economic, political, social, and cultural resources is a step to help women overcome these barriers and increase their confidence so that they can play an active role in solving problems.

This dissertation offers a perspective on how gender approaches can be implemented in women's empowerment programs. This perspective has significantly contributed to efforts to achieve gender equality and women's economic independence in Lampung, namely Pesawaran Regency and East Lampung Regency. This research shows that with the right support, women can overcome their challenges and make a positive contribution to the economic and social progress of society. The following is a table of Population Age 15+ by Type of Activity and Gender in Lampung, 2020-2022. Table 1.3 List Population Age 15+ by Type of Activity and Gender of Lampung Province, 2020-2022

Main Activity	Population Age 15+ by Type of Activity and Gender of Lampung Province								
	2020	Man			Women			Total	
		2021	2022	2020	2021	2022	2020	2021	2022
Workforce	2838661	2879580	3123384	1656291	1716351	1781516	4494952	4595931	4904900
Worker	2712757	2761607	3019009	1571563	1626359	1678649	4284320	4387966	4697658
Unemployment	125904	117973	104375	84728	89992	102867	210632	207965	207242
Not the Labor	479550	475204	454266	1506687	1489117	1644126	1986237	1964321	2098392
Force									
School	190649	226697	229184	217946	236848	261370	408595	463545	490554
Taking Care of the Household	123845	96991	99399	1189028	1165421	1308324	1312873	1262412	1407723
Other	8905	11860	9884	2796	4323	5355	11701	16183	15239

During the period from 2020 to 2022, the participation of women aged 15 years and older in Lampung has changed significantly. The number of women in the workforce has increased significantly. A big surge occurred in 2022 after experiencing a decline in the previous year. This shows the active involvement of women in the job market. In addition, there was a fluctuation in the number of women working, with a decrease in 2021 but an increase again in 2022. This trend shows that despite the challenges in 2021, employment opportunities for women increased significantly in 2022, reflecting efforts to increase women's labor participation and economic empowerment. The Gender Empowerment Index (IDG) in Pesawaran Regency and East Lampung Regency shows interesting dynamics in the context of women's empowerment and family economic independence from 2020 to 2022. In Pesawaran, IDG reached its peak in 2021 before declining slightly the following year. Meanwhile, in East Lampung, the IDG level was relatively stable, with a slight decline in 2022, reflecting fluctuations in that period. This trend shows that despite the challenges, women's empowerment programs have had a positive impact on family economic independence. However, this requires more sustainable adjustments and strategies to maintain and improve the achievement.

Table 1.4 List
Gender Empowerment Index (IDG) 2020-2022

Region	Gender Empowerment Index (IDG)		
	2020	2021	2022
West Lampung	68,24	69,14	65,92
Tanggamas	56,80	56,39	56,54
South Lampung	59,59	59,27	59,37
East Lampung	63,13	63,14	62,34
Central Lampung	61,96	61,01	63,27
North Lampung	65,21	64,94	64,29
Way Kanan	60,72	61,82	60,36
Tulang Bawang	64,10	64,76	66,95
Pesawaran	72,21	73,70	71,98
Pringsewu	67,32	65,86	66,13
Mesuji	68,89	68,45	68,50
Tulang Bawang Barat	52,25	52,10	56,72
Pesisir Barat	56,02	54,93	55,37
Bandar Lampung	71,88	71,69	72,33
Metro	78,98	74,23	74,60
Lampung Province	69,06	67,96	68,24

The women's empowerment model is a systematic approach designed to improve women's abilities, skills, and knowledge so that they can achieve economic, social, and political independence (Kabeer, 2005). Women's empowerment is a process to provide women with abilities and opportunities to develop their potential. This includes women's involvement in accessing education, health, economy, politics, and social participation. Through empowerment, it will increase productivity and income so that economic growth is better. The problems faced by women need to be solved, namely in the form of empowerment. According to Law No. 20 of 2008 concerning the principles and objectives of empowerment. Empowerment aims to improve the people's economy to increase people's income and welfare and expand employment opportunities for people to alleviate poverty problems. Women's empowerment has a wide field of work (Bertha, 2023).

Women's empowerment is an effort to enable women to gain access and control over resources, economic, political, social, and cultural. So that they can organize themselves and increase their self-confidence, as well as actively participate in solving problems to build their abilities and confidence. In the process, it is an effort to strengthen the power and empowerment of weak groups in society. In addition, empowerment focuses on the desired outcome of social change, namely, society becoming empowered (Rezsa, 2022). To achieve gender-equitable development, where men and women have equal opportunities to develop, women must be understood as the strength of the nation. A strategic way to increase women's potential and role is women's empowerment. Empowerment prioritizes the value of independence to avoid dependence on men. Women's empowerment in nation-building will result in social change and improve the country's quality of life.

The issue of unemployment and labor policy has been a concern for researchers since several decades ago. John Maynard Keynes, in his book *The General Theory of Employment, Interest and Money*, argues that the ideal condition in a country is when the unemployment rate is close to 0% (full employment). Government policies that are oriented towards full employment also have an impact on increasing investment and economic growth. Keynes's idea of the ideal condition of employment was continued by many subsequent researchers, such as William Phillips (1958), Milton Friedman (1968), James Tobin (1997), Paul Krugman (2008), and others. One of the factors for the low number of entrepreneurs in Indonesia is the lack of individual skills in entrepreneurship.

Citing a report released by the SMERU research institute, only 0.5 per 100 15-year-old Indonesian individuals have very high skills. Other countries have better outcomes, such as the United States 6.5 per 100 individuals, Thailand 9.4, and South Korea 18.2 (Lidwina, 2019). Individual skills are still minimal, making it difficult for Indonesia to produce new entrepreneurs, even though entrepreneurship is important to create new jobs, absorb labor, increase state tax revenues, encourage community innovation, and become an indicator of Indonesia's competitiveness in the global arena (Yeni, 2020). This research will make a real contribution to building a holistic empowerment model, integrating skills training with ongoing community support and strategic partnerships. This effort is expected to create a significant positive impact on increasing women's economic independence in Pesawaran and East Lampung Regencies. Make them more prepared and confident in facing future financial challenges.

METHOD

The researcher analyzed whether the training program in BLKK could improve women's life and economic skills and provided insight into the potential and challenges of implementing the community empowerment program. This study

views community empowerment as a process where women gain the skills, knowledge, and confidence to contribute actively to their households and local economies, fostering a more sustainable and resilient society. The primary data source is recorded through written records, video/audio recordings, photo captures, or movies (Lexy, 2018). The total number of respondents is 73, and the criteria include the coordinator of the Vocational Training and Productivity Center (BBPVP) Serang Sumatera Region. The Head of the Community Center is an individual responsible for the overall operation and management of the center, ensuring that the training program aligns with community needs. Training instructors are professional individuals who teach and guide participants during the program by having practical and technical knowledge according to the Competency and possessing a Certificate of Competence in Garment Apparel. Participants are categorized based on their educational backgrounds and potential contributions to community empowerment. Those with higher education (S1) represent individuals who can optimally utilize their skills, potentially training others and becoming community leaders in entrepreneurship. Participants from younger age groups with secondary education (SMA) are identified as having high motivation to start a business, contributing to local economic growth. Meanwhile, participants with basic education (SD) provide insight into training needs for those with minimal educational backgrounds, ensuring inclusivity in community empowerment efforts. The research also collects information from government policy documents and programs related to women's empowerment, life skills development, and vocational training in the handicraft and clothing manufacturing sectors. Additionally, researchers utilize scientific articles, books, and other academic publications to contextualize the findings within broader discussions of community development. The observation in this study uses moderate participation, meaning that the researcher maintains a balance between being an insider and an outsider, ensuring a comprehensive understanding of how empowerment unfolds at different levels. The type of interview used in this study is a semistructured interview, which allows flexibility while maintaining focus on key themes (Esterberg, 2002). The interviewer follows general guidelines but adapts the wording and sequence of questions based on the conversation's natural flow (Satori, 2024). Furthermore, Krueger and Casey (2000) explain that Focus Group Discussions (FGDs) are a qualitative data collection technique involving structured or semi-structured discussions with small groups (5-9 participants). In this study, FGDs help to explore participants' perceptions, opinions, and attitudes regarding empowerment, economic independence, and social transformation. The Model of Women's Empowerment in Developing Life Skills through Making Clothes at Community Work Training Centers in Pesawaran Regency and East Lampung Regency is assessed through documentation techniques, including training modules, the BLKK syllabus, activity reports, attendance records, photos, videos, rules, policies, and cooperation agreements. These records provide evidence of how the training program facilitates community empowerment by enabling women to develop life skills, achieve economic independence, and contribute to broader social change. For data analysis, the study employs qualitative content analysis to interpret textual, visual, and recorded data systematically. Thematic analysis is applied to interview transcripts, FGDs, and observation notes to identify recurring patterns and insights related to women's empowerment and life skills development. Coding techniques are used to categorize responses into key themes such as economic independence, skill utilization, training effectiveness, and social impact. Triangulation is employed by cross-referencing findings from different data sources—interviews, FGDs, documentation, and direct observation—to enhance reliability and validity. This approach ensures a comprehensive understanding of how the BLKK training program influences community empowerment at multiple levels.

RESULTS AND DISCUSSION

East Lampung Regency was established based on Law Number 12 of 1999 concerning the Establishment of Regional Regencies, inaugurated on April 27, 1999, with the center of government in Sukadana City. East Lampung Regency, at its inception, included ten definitive sub-districts, 13 auxiliary sub-districts, and 232 villages. East Lampung Regent Regulation Number 23 of 2007 concerning the Elimination of Sub-districts to Villages, the number of villages in East Lampung Regency changed to 257 villages. Furthermore, based on East Lampung Regency Regional Regulation Number 04 of 2011 concerning the Establishment of 7 Villages in East Lampung Regency, East Lampung Regency currently consists of 24 definitive sub-districts and 264 villages. The capital is Sukadana District. East Lampung Regency has a total area of 5,325.03 km². This regency has the motto "Bumei Tuwah Bepadan."

Empowerment model based on life skills development to increase economic independence at the Community Job Training Center (BLKK) of Lampung Province

Deliberative empowerment adopts methods from four theories, namely Participatory Action Research (PAR), Asset-Based Community Development (ABCD), Community-Based Participatory Research (CBPR), and Business Model Canvas (BMC), emphasizing the importance of deliberation, cooperation, and active participation at every stage of the empowerment process. Amartya Sen, in his book *Development as Freedom*, emphasizes that empowerment must be based on individual freedom to participate in decision-making that affects their lives. The stages in deliberative empowerment include outreach (reach and mapping of potential), retreat (development of work tools), partnership (collaboration with various elements), dissemination (dissemination of empowerment results), and monitoring and evaluation (money), which involves the participation of all stakeholders in assessing the progress of the empowerment program.



Figure 1. FGD in BLKK East Lampung.

Deliberative empowerment that emphasizes active participation, deliberation, and cooperation is closely related to the theory of civil society civilization inspired by Islamic principles. Civil society in the context of Islam is a highly civilized society that upholds the values of justice, brotherhood, and deliberation, as implemented by the Prophet Muhammad SAW when building the Medina society. The main principles in deliberative empowerment, namely active participation and deliberation, have parallels with the concept of deliberation applied in civil society. Deliberation is one of the important pillars emphasized in the Qur'an (QS. Asy-Syura: 38) and is used as a basis for collective decision-making. Likewise, in deliberative empowerment, every decision in the empowerment process is taken through participation and joint discussion, involving all interested parties to achieve common goals. In addition, the concept of brotherhood (*ukhuwwah*) in civil society is also in line with the principle of partnership in deliberative empowerment. In both theories, solid cooperation between various elements of society, such as communities, government, business, and the media. It is very important to achieve shared prosperity. This is also seen in the Medina community, where the Prophet Muhammad SAW united the Muhajirin and Anshar through brotherhood (*ukhuwwah Islamiyah*) and built a strong partnership between them.

Amartya Sen, in his book *Development as Freedom*, emphasizes the importance of individual freedom to participate in the decision-making process that affects their lives. This concept reinforces the principles of justice and freedom that are also the basis of the Medina Charter, the first constitutional document that provides religious freedom and justice for all communities in Medina. The Medina Charter emphasizes the importance of justice, freedom, and togetherness in building a harmonious and empowered society. The application of Amartya Sen's concept of *Development as Freedom* in the Community Work Training Center (BLKK) in Pesawaran and East Lampung can be seen in the implementation of individual freedom to choose according to style. Along with the principles of justice and freedom contained in the Medina Charter, BLKK can provide an equal space for participants from various backgrounds to participate in the learning and decision-making process. Deliberative Empowerment Stages:

1) Outreach (Outreach and Potential Mapping) At this stage, BLKK Fatayat NU begins with community outreach, mapping the potential in the community, and recruiting training participants. The recruitment process is carried out inclusively through manual and digital methods, using the SIAPkerja platform provided by the Ministry of Manpower. This shows BLKK's commitment to ensuring that every individual has an equal opportunity to participate in this program without discrimination. 2) Retreat (Work Equipment Development) At this stage, BLKK develops training programs by preparing equipment, facilities, modules, and instructors. Preparation of infrastructure and administrative completeness before the training begins. Each participant and instructor must have a Task Order (SPT) or Decree (SK) so that their duties are clearly defined. 3) Partnership (Cooperation with Community Elements) BLKK Fatayat NU has collaborated with Yasmin Cooperative, Asih Tailor Merapi, and Tailor An-Nisa, although the implementation has not been maximized. This collaboration is part of an effort to provide access to training participants to be involved in the job market or develop independent businesses. This collaboration is in line with the Deliberative concept, which emphasizes collaboration, business, community, government, and media for the success of the empowerment program. 4) Dissemination (Dissemination of Empowerment Results) One form of dissemination of program results is through social media, especially Instagram, which is used by BLKK Fatayat NU to promote training activities. Based on the findings, the promotion of participants' product results is still limited to documentation of training activities and has not been focused on marketing products widely. BLKK also plans to be more active in marketing participants' sewing products to increase their income.

5) Monitoring and Evaluation (Monev) At the Monev stage, BLKK monitors the progress of the program in a participatory manner, involving participants, instructors, and government officials in evaluating the success of the program. Monitoring is carried out during implementation, and the results are used to improve and develop the program in the future. Evaluation of instructor performance, training facilities, and participant outcomes is an important part of this process. This study found specific deficiencies in several stages of training program implementation at BLKK East Lampung and Pesawaran. The main deficiency lies in the Planning and Module Development Stage (Outreach and Retreat). BLKK has not involved academic elements in designing the curriculum and training modules. Although the training modules have been determined by the Ministry of Manpower, the involvement of local educational institutions or academics can enrich the modules with more contextual adjustments to the needs of local participants. Stages Program Implementation (Partnership). At this stage, involvement in business elements or the business world is not yet optimal. BLKK has not implemented real projects involving sustainable marketing of training products or efforts to establish partnerships with businesses. Cooperation with business elements, such as convection companies or product sales in the local market, is still limited to plans and has not been realized. Dissemination Stages (Disseminate) Dissemination of program results through social media is still focused on documentation of activities, not yet fully directed at commercial product promotion. Scientific publication or documentation of best practices of the program has also not been carried out, either in national or international journals. This step is important as an effort to share the success of the BLKK training program widely and provide scientific contributions to the field of community empowerment.



Figure 2. FGD in BLKK Pesawaran.

Deliberative Empowerment Model, namely becoming a Deliberative Empowerment Model Based on Life Skills that integrates the Principles of Human Capital Management (HCM) with Islamic Principles and Characteristics of Civil Society in Community Job Training Centers (BLKK). Based on previous research that differentiates this study, including the research of Ahu Sumbas and Berrin Koyuncu (2018), who found that gender-sensitive policies, such as gender budgeting and women's support centers, are effective in empowering women in Turkey (Turkish Studies). Marijke Sniekers and Marieke van den Brink (2018) showed that social norms and institutional structures prevent young mothers in the Netherlands from achieving economic independence (Journal of Youth Studies). Karen Leppel et al. found that job training increases the satisfaction and well-being of senior workers in the United States (Job Characteristics Model). Aas Nurasyiah et al. (2023) revealed that Islamic-based wealth management helps increase the economic independence of women micro-entrepreneurs in Indonesia (Review of Islamic Economics and Finance).

In Indonesia, Bahri and Widodo Prasetyo (2021) emphasized the importance of digital entrepreneurship training to increase economic independence. Mastarina Barus (2019) integrated vocational and non-vocational life skills for the empowerment of women. Ragil Atmaja et al. (2020) studied the role of non-formal education in the empowerment of public socio-economic status. Syamsul Bakhri Gaffar (2021) shows the importance of cooperation across sectors in training skills life, especially sewing. Ivan Lilin Suryono et al. (2022) evaluated the effectiveness of BLKK in increasing the quality of power work, and Yeni Nuraeni et al. (2023) highlighted the importance of soft skills in the preparation of power Work facing Industry 4.0 and 5.0.

Meanwhile, this dissertation research presents a deliberative approach through five key stages (outreach, retreat, partnership, dissemination, and monitoring) involving deliberation, active participation, and cross-sector collaboration. In addition, this research provides a new dimension by highlighting the synergy of human, social, and organizational capital that is applied contextually while strengthening soft skills such as Motivation and Self-confidence as the main supporters of hard skills, with Islamic Principles and Characteristics of Civil Society at the Community Work Training Center (BLKK). Based on the findings above, the researcher displays model in the form of a diagram.

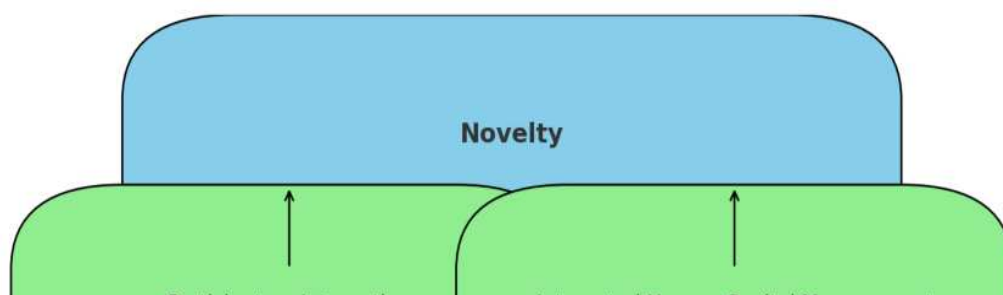


Figure 1.1 Diagram of Novelty Findings of the Empowerment Model Based on Deliberative Synergy

Based on all the novelty findings above, researchers can conclude that the words have the following meanings: DEL SYN (Deliberative Synergy). D: Deliberative (Deliberation, in-depth discussion, and joint decision-making; E: Engagement (Involvement) active various stakeholders' interests, L: Leadership (Leadership) in build collaboration cross-sector), S: Synergy (Collaboration and integration) between human, social, and organizational capital elements). Y: Yield (Result or impact sustainable empowerment). N: Networking (Network development) social and economical for support program).

Implementation of the Principles of Women's Rights at the Community Work Training Center (BLKK) of Lampung Province

The book *Sittin al-'Adliyah* by Kiai Faqihuddin Abdul Kodir discusses various aspects of women's rights in Islam, with an emphasis on justice and women's rights in the family and society. The three main hadiths reviewed, namely Hadith 6, Hadith 9, and Hadith 15, emphasize the role and rights of women in various social and economic fields.

In the context of empowerment at BLKK Fatayat NU and Muslimat NU, the implementation of Islamic values that honor women is very visible. Based on the findings of empowerment, participants who come from various social and economic backgrounds are given equal opportunities to learn and develop. This is very relevant to Islamic teachings that emphasize justice and equal rights between men and women, as reflected in the book *Sittin al-'Adliyah* by Kiai Faqihuddin Abdul Kadir.

Islam Eroding Discriminatory Traditions against Women, Women's Rights to Education and Social Security, Women's Rights to Work in Public Spaces from Islam Eroding Discriminatory Traditions against Women explains that Islam eliminates the jahiliyyah tradition that discriminates against women and replaces it with high respect for women's rights. At BLKK, this is realized through inclusive policies that ensure that all participants, regardless of background, are treated fairly. Women are given full rights to acquire skills, participate in decision-making, and are allowed to be economically independent. Women's rights to education and social security are also the basis for implementing training programs at BLKK.

Participants are encouraged to develop skills that enable them to become independent and dignified individuals so that they can contribute to their families and communities. Training at BLKK not only provides technical education but also instills spiritual values, where participants understand the importance of education as a means to achieve social and economic well-being. Women's rights to work in public spaces. Training at BLKK Fatayat NU and Muslimat NU directly implements this by opening up opportunities for women to be actively involved in economic activities, namely sewing. The entire training program at BLKK reflects Islamic teachings that glorify women, affirming that women have the same rights as men in obtaining education, social security, and public roles. With an approach that combines technical skills and spiritual values, this training has succeeded in shaping participants into individuals who are socially, economically, and spiritually empowered.

Changes in Participants' Life Skills in the Women's Empowerment Program at the Community BLK to Economic Independence

Life skills, or skills life, are divided into two main categories, namely hard skills and soft skills. Illah Sailah (2024) emphasized that soft skills are skills related to interpersonal and intrapersonal abilities, such as communication skills, leadership, critical thinking, and self-management. Soft skills are considered drivers of technical skills (hard skills), which means that someone who has good technical skills will be more effective if equipped with soft skills.

Hard skills refer to technical skills related to mastery of science and technology relevant to a particular job or field. Robert Katz, in his theory of managerial skills, divides these technical skills into three categories: technical skills, humanistic skills, and conceptual skills. These technical skills (hard skills) include operational abilities in carrying out specific tasks, such as using tools or technology and completing technical procedures effectively. At the Community Work Training Center (BLKK) in Pesawaran and East Lampung, the development of hard skills or technical skills is the main focus of training participants. The hard skills taught at BLKK include technical skills relevant to the field of clothing manufacturing, which requires mastery of technology and tools used in the textile and fashion industry. The application of hard skills here is not only limited to teaching theory but more to developing practical abilities to improve participant competence. In BLKK Pesawaran and East Lampung, the application of technical skills is visible in the training process given to participants. Instructors at BLKK play an active role in ensuring that each participant not only understands the theory but is also able to use and apply technical knowledge to complete practical tasks. 1) Understanding Patterns and Design, namely, Participants are taught to read and understand clothing patterns, which are the basis of every clothing-making process. Understanding this pattern is a technical skill that requires analytical skills, where participants must measure accurately, cut the fabric, and arrange the pieces according to the desired pattern. 2) Sewing Machine Usage As part of the technical skills, participants are trained to use various types of sewing machines properly and correctly. They learn sewing techniques that involve needle setting, machine speed control, and thread setting. The use of this sewing machine includes the application of procedures that must be carried out correctly so that the resulting product has good quality. 3) Specific Sewing Technique Application Participants are also trained to master various sewing techniques, such as straight stitches, zigzags, overlocks, and good finishing techniques. Each of these techniques has its procedures and methods, which must be mastered by participants so that the final results are by the established standards. This training is not only theory-based but involves direct practice where participants are taught to apply technical methods according to the design needs and materials used.

Overall, the application of technical skills at BLKK Pesawaran and East Lampung, supported by training modules from the Ministry of Manpower, shows that participants gain not only applicable technical skills but also a deep understanding of occupational safety, standard procedures, and complete theory and curriculum. This combination of theory, practice, and occupational safety should have become a strong basic capital, especially in the field of fashion design and clothing manufacturing. The implementation of training modules at BLKK Pesawaran and East Lampung, although designed comprehensively and structured by the Ministry of Manpower, faces several challenges related to the flexibility of time between theory and practice. One of the problems that arose from the implementation of this module is the theory material that is too rigid, and the schedule is tight, thus reducing the time allocated for participants' practical activities. This is an important concern because, in the context of vocational training, such as fashion design, direct practice is a key element in developing participants' skills.

Soft skill components such as communication, leadership, critical thinking, and self-management in BLKK are mostly developed informally because these soft skill components are not explicitly regulated in the training module. The training module focuses more on technical skills (hard skills). The instructors provide a lot of motivation related to self-confidence, especially for those who are new to learning sewing skills. The instructors not only teach technical skills but also encourage participants to be more confident in facing learning challenges. This motivation is given in various ways, such as giving awards for each participant's achievement, opening discussion sessions, and creating a supportive learning environment. On the other hand, the self-management aspect still needs improvement because the instructors and modules have not fully directed participants to manage time, set priorities, or plan independently. The addition of soft skill elements to the training module can be a significant step in improvement.

Integration of Human Capital Management into Empowerment based on life skills development to increase economic independence at the Community Job Training Center (BLKK) of Lampung Province

The integration of Human Capital Management (HCM) into empowerment based on life skills development at the Community Job Training Center (BLKK) of Lampung Province has proven to be a strategic approach in enhancing economic independence among women. HCM, as defined by Armstrong, Michael, and Baron, positions human capital as a critical organizational asset that encompasses knowledge, skills, experience, and learning capacity. This concept aligns with Al-Ghazali's economic philosophy, which emphasizes that economic activity serves not only as a means of individual survival but also as a mechanism to create prosperity and contribute to societal well-being. The fusion of these perspectives underscores the necessity of investing in human potential to drive sustainable economic empowerment.

Empirical findings from BLKK Lampung Timur and Pesawaran indicate that the structured integration of human, social, and organizational capital forms a strong foundation for participant empowerment. Human capital development is evident in the enhancement of sewing and fashion skills, where participants undergo 200–260 hours of training covering theoretical knowledge and hands-on practice in garment production, including pattern-making, cutting, sewing, and finishing techniques. Statistical data shows that 95% of participants demonstrated improved technical abilities, with over 70% successfully completing practical assessments with high scores. Furthermore, 68% of graduates expressed confidence in starting their own businesses, and 47% have already engaged in home-based enterprises, generating an average monthly income of IDR 1.5 million to IDR 3 million, directly contributing to their economic independence. In addition to technical training, soft skills development, such as occupational safety (K3), motivation, and business planning, further strengthens participants' readiness for entrepreneurship. Reports indicate that 89% of participants experienced increased self-confidence and decision-making abilities due to the program's structured training environment.

Social capital in BLKK emerges through collaborative networks built during and after the training, ensuring knowledge continuity and support systems for participants. Peer mentorship programs facilitate skill-sharing, while instructors provide post-training guidance to help graduates navigate business challenges. Institutional support from the Ministry of Manpower plays a crucial role in sustaining program success by providing funding, instructor certification, and business consultation services. The involvement of the Fatayat NU and Muslimat NU communities further strengthens social empowerment, as they offer moral and business mentorship, creating a supportive ecosystem for women entrepreneurs. Additionally, structured collaborations between BLKK graduates and local garment producers enable market access, with 34% of graduates securing contract-based projects. Plans for partnerships with cooperatives such as Koperasi Yasmin are also underway, aimed at providing financial and logistical support to scale participants' businesses.

The organizational capital within BLKK is reflected in its well-structured curriculum, training methodologies, and systematic documentation procedures. The curriculum follows national competency standards (SKKNI) for garment production, ensuring that skills acquired are aligned with industry demands. Certification from the program enhances employability, increasing the likelihood of participants securing formal employment or launching their own businesses. Comprehensive training records, including attendance tracking, progress evaluations, and practical skill assessments, allow for long-term monitoring of participant outcomes. Evaluations indicate that 82% of alumni believe that additional modules, such as digital marketing, could further enhance their post-training employability and business sustainability. Moreover, the integration of Islamic values, reinforced by Fatayat NU and Muslimat NU, ensures that the economic empowerment process is ethically grounded. Ethical business practices, such as fair pricing, transparency, and community-oriented entrepreneurship, are embedded into the training curriculum, aligning with Al-Ghazali's vision of economic activity as a means to achieve social prosperity.

The study confirms that the integration of HCM, social capital, and organizational capital within BLKK results in measurable improvements in women's economic independence. Vocational training at BLKK not only enhances individual financial stability but also strengthens community resilience by fostering entrepreneurship and skill-based employment. The findings validate the synergy between modern workforce development strategies and Islamic economic principles, demonstrating that investing in human potential leads to broader socio-economic benefits. Moving forward, further research on long-term career progression among BLKK graduates is recommended to assess the sustainability of economic empowerment. Additional training in digital business strategies could also expand market opportunities for home-based enterprises, while stronger partnerships with cooperatives and microfinance institutions would further support graduates in scaling their businesses. By continuously refining its training methodologies, strengthening collaborative networks, and fostering an inclusive and ethical learning environment, BLKK can enhance its role in developing a skilled, independent, and economically empowered community of women entrepreneurs.



Local Management BLKK Lampung Province

Sc through support from the Ministry of Manpower, instructors, and the Fatayat NU community. Collaborative structures built during the training, both among participants and participants strengthened social ties and supported the growth of technical skills, while support from the Ministry of Manpower in the form of Program assistance, instructors, and the head of the center ensured that participants had continued guidance even after the formal training had finished. The Fatayat NU and Muslimat NU communities also provided moral and social support, which greatly assisted participants in maintaining motivation and applying the skills they had learned to real businesses. The organizational capital in BLKK is reflected in a structured curriculum, systematic training procedures, and complete documentation of each training activity. The curriculum, which is designed according

to industry standards, allows technical knowledge to be institutionalized effectively and passed on to each generation of participants. The training assessment and documentation procedures also ensure that there is valuable historical data for future program evaluation and improvement. In addition, the integration of Islamic values strengthened by the Fatayat and Muslimat NU communities adds an ethical dimension to encouraging women to be economically and socially empowered.

CONCLUSION

The main novelty of this study is the development of a Life Skills-Based Deliberative Empowerment Model that integrates Human Capital Management (HCM) principles with Islamic values in industry-standard skills training at the Community Job Training Center (BLKK). This model emphasizes deliberation, cooperation, and active participation in the Pesawaran BLKK, involving the head of the center, instructors, community leaders, and village government to ensure the training meets community needs. Participants actively engage in discussions and hands-on practice, improving not only technical skills but also self-confidence and teamwork. Although partnerships with the Ministry of Manpower, village apparatus, and local communities have been established, collaborations with cooperatives and textile businesses remain in the planning stage. Additionally, academic institutions have not been involved in module and curriculum design, leaving room for further development in scientific and contextual aspects. The integration of women's rights in Islam at BLKK Fatayat NU and Muslimat NU reinforces gender equality by providing training that respects and empowers women. Participants are not only taught technical skills but also educated on their rights to respect, education, and public participation. The training incorporates Islamic values of equality and justice, enabling women to grow in social, economic, and spiritual aspects. BLKK promotes inclusive education and social security to support women's welfare, emphasizing that Islam encourages their active role in society. These values are reinforced through training sessions and book studies, providing participants with a deeper understanding of their contributions beyond the domestic sphere. Participants develop hard skills in fashion design and clothing making, including pattern making, sewing machine operation, and specific garment production techniques. The competency-based training module from the Ministry of Manpower ensures mastery of technical procedures and work safety, although balancing theory and practice remains a challenge. Soft skills such as communication, self-confidence, and leadership are developed through instructor guidance and peer support. However, self-management skills have not been explicitly integrated into the training module, requiring further improvement. The integration of Human Capital in BLKK is evident through the enhancement of technical and theoretical skills, work safety practices (K3), and participant motivation. Social capital is fostered through collaboration between participants, instructor mentorship, and support from the Fatayat NU and Muslimat NU communities, which strengthen social networks and business opportunities. Organizational capital is reflected in the industry-standard curriculum, structured training procedures, and comprehensive documentation, ensuring sustainability and program relevance. The integration of Islamic values and local wisdom enriches the training, making it not only technically effective but also ethically, spiritually, and socially impactful, ultimately improving participants' well-being in both worldly and religious aspects.

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REFERENCES

- Adi, I. R. (2019). *Intervensi komunitas dan pengembang masyarakat (sebagai upaya pemberdayaan masyarakat)*. Jakarta: PT Raja Grafindo Persada.
- Afni, N., Rezal, M., & Latoki, L. (2022). Konsep kesetaraan gender dalam pembangunan dan pemberdayaan ekonomi masyarakat. *Musawa: Journal for Gender Studies*, 14(1), 19–48. <https://doi.org/10.24239/msw.v14i1.980>
- Agussani. (2021). *Desain pemberdayaan masyarakat modern*. Depok: PT Raja Grafindo.
- Aida, V. S. H. (2010). *Pemberdayaan perempuan dari masa ke masa*. Bogor: IPB Press.

- Alfarisi, S., & Saputra, A. (2020). Pengembangan life skill untuk kemandirian anak di Panti Asuhan Budi Utomo Muhammadiyah Metro. *Jurnal Bina Ummat: Membina dan Membentengi Ummat*, 3(2), 1–23. <https://doi.org/10.38214/jurnalbinaumatstidnatsir.v3i02.74>
- Alfirdaus, L. K. (2021). Pemberdayaan perempuan dalam implementasi Undang-Undang No. 6 Tahun 2016 di Desa Lerep, Kabupaten Semarang. *Jurnal Pengabdian Vokasi*, 2(1), 26–33. <https://doi.org/10.14710/jpv.2021.11174>
- Ali, M. M. (n.d.). Membumikan Islam Nusantara: Respons Islam terhadap isu-isu.
- Aliyah, A. H. (2022). Peran usaha mikro kecil dan menengah (UMKM) untuk meningkatkan kesejahteraan masyarakat. *Welfare: Jurnal Ilmu Ekonomi*, 3(1), 64–72. <https://doi.org/10.37058/wlfr.v3i1.4719>
- Anas, M. (2020). Kiai dan kemandirian ekonomi pesantren. *Maliyah*, 10(1), 68–98. <https://doi.org/10.15642/maliyah.2020.10.1.68-98>
- Anderson, C. E., McDougald, J. S., & Cuesta Medina, L. (2015). CLIL for young learners. *Children Learning English: From Research to Practice*, 137–151. <https://doi.org/10.4324/9781003173151-19>
- Andreas, S., & Devi, A. D. (2020). Pendidikan Islam dalam perspektif pendekatan sosiologi. *Al-Azkiya: Jurnal Ilmiah Pendidikan MI/SD*, 5(2), 143–149. <https://doi.org/10.32505/v4i1.1007>
- Ardial. (2014). Paradigma dan model penelitian. Jakarta: Bumi Aksara.
- Ardiani, F. D., & Dibyorini, M. C. R. (2021). Pemberdayaan perempuan melalui kelompok wanita tani (KWT) 'ASRI' Kalurahan Bendung Kapanewon Semin Kabupaten Gunung Kidul. *Sosio Progresif: Media Pemikiran Studi Pembangunan Sosial*, 1(1), 1–12. <https://doi.org/10.47431/sosioprogresif.v1i1.111>
- Asnawan, D. M. A., Sa'diyah, H., Efendi, M. D., Azizah, S. A., & Rohman, T. (2022). Pemberdayaan perempuan UMKM melalui digital marketing di Desa Jombang Kecamatan Jombang. *Journal of Dedication Based on Local Wisdom*, 2(2), 189–202. <https://doi.org/10.35719/ngarsa.v2i2.320>
- Astuti, D. (2021). Peran pemerintah dalam mewujudkan kesejahteraan dan kemandirian masyarakat. *Jurnal Ensiklopedia*, 3(1), 193–205. <https://doi.org/10.33559/eoj.v3i3.746>
- Aulia, F., Sativa, O., Padmono, P. W., & Wibowo, I. P. (2023). Pembinaan kemandirian di Lapas Kelas IIA Purwokerto ciptakan life skill narapidana. *Jurnal Riset dan Inovasi Manajemen*, 1(4), 234–245. <https://doi.org/10.59581/jrim-widyakarya.v1i4.1475>
- Basuki, A., & Prasetyo, Y. E. (2007). *Memusiumkan kemiskinan* (1st ed.). Surakarta: Pusat Telaah dan Informasi Regional Pattiro.
- Batliwala, S. (2014). Engaging with empowerment: An intellectual and experiential journey. *Women Unlimited*.
- Beloan, B., Rostini, R., Iriani, N., Ilyas, N., Jamaluddin, A., Harniati, H., & Syahribulan, S. (2023). Pemberdayaan perempuan dalam meningkatkan kesejahteraan ekonomi keluarga. *Journal of Training and Community Service Adptersi (JTCSA)*, 3(1), 40–44. <https://doi.org/10.62728/jtcsa.v3i1.334>
- Chant, S. (Ed.). (2010). *The international handbook of gender and poverty: Concepts, research, policy*. Edward Elgar Publishing.
- Creswell, J. W. (2013). *Research design: Pendekatan kualitatif, kuantitatif, dan mixed methods*. Yogyakarta: Pustaka Belajar.
- Diler, A. M., & Lukman, A. I. (2024). Pemberdayaan masyarakat melalui metode life skill di Kampung Dilang Puti Kabupaten Kutai Barat. *E-Journal Pemerintahan Integratif*, 10(6), 397–406. <https://ejournal.pin.or.id/site/?p=2321>
- Duflo, E. (2012). Women empowerment and economic development. *Journal of Economic Literature*, 50(4), 1051–1079.
- Eko Cahyono, A. (2022). Model pembelajaran ekstrakurikuler berbasis kecakapan hidup (life skills). *Sasana: Jurnal Pendidikan Agama Islam*, 1(1), 1–11. <https://doi.org/10.56854/sasana.v1i1.45>
- Eryadini, N., Ratna, N., & Nufus, A. F. (2021). Pengaruh pemberdayaan perempuan terhadap peningkatan ekonomi produktif. *Journal of Education and Religious Studies*, 1(1), 22–26. <https://doi.org/10.57060/jers.v1i01.11>
- Fabeliarini, A., Sihabudin, A. A., & Vestikowati, E. (2022). Analisis fungsi kelembagaan lembaga pemberdayaan masyarakat dalam pelaksanaan pembangunan di Desa Parakanmanggu Kecamatan Parigi Kabupaten Pangandaran. *Unigal*, 2(1), 2252–2266. <https://repository.unigal.ac.id/handle/123456789/1076>
- Faiqoh, P., & Desmawati, L. (2021). Pemberdayaan perempuan melalui home industri batik Sekar Jagad di Dusun Tanuraksan Desa Gemeksekti Kabupaten Kebumen. *Lifelong Education Journal*, 1(1), 23–34. <https://doi.org/10.59935/lej.v1i1.17>
- Farisi, S. A., Fasa, M. I., & Suharto. (2022). Peran UMKM (Usaha Mikro Kecil Menengah) dalam meningkatkan kesejahteraan masyarakat. *Jurnal Dinamika Ekonomi Syariah*, 9(1), 73–84. <https://doi.org/10.53429/jdes.v9iNo.1.307>
- Fatih, M. K., & Hakim, N. (2023). PKM pengembangan desa wisata berbasis pemberdayaan masyarakat menuju kemandirian ekonomi desa di Kabupaten Gresik. *Guyub: Journal of Community Engagement*, 4(3), 437–460. <https://doi.org/10.33650/guyub.v4i3.7145>
- Fitri, I. R., & Rahmawati, I. (2023). Pemberdayaan santri melalui program kursus menjahit di Pondok Pesantren Al-Bayan Rangkasbitung. *Jurnal Pemberdayaan Masyarakat*, 10(2), 96. <https://doi.org/10.37064/jpm.v10i2.12468>

- Fratama, A. (2021). Peran lembaga pemberdayaan masyarakat (LPM) dalam pembangunan fisik di Desa Telaga Kecamatan Batu Ampar Kabupaten Kutai Timur. *E-Journal Ilmu Pemerintahan*, 9(1), 61–74. <https://ejournal.ip.fisip-unmul.ac.id/site/?p=3627>
- Galinsky, E. (2011). *Mind in the making: The seven essential life skills every child needs*. Harper Paperbacks.
- Ghani, A. (2021). Rekonstruksi pendidikan life skill melalui pengembangan pendidikan keterampilan dalam kurikulum madrasah. Halimi: *Journal of Education*, 1(2), 19–39. <https://ejournal.kopertais4.or.id/madura/index.php/halimi/article/view/4944>
- Gibson, C., & Woolcock, M. (2007). Empowerment, deliberative development, and local level politics in Indonesia: Participatory projects as a source of countervailing power (BWPI Working Paper 8). Brooks World Poverty Institute, University of Manchester.
- Gufronul, A. (2020). Gaya kepemimpinan kiai dalam membangun. *Muhasabatuna: Jurnal Akuntansi dan Keuangan Islam*, 1(2), 30–46. <https://doi.org/10.54471/muhasabatuna.v2i2.825>
- Gunawan, S. (2018). *Pembangunan daerah dan membangun masyarakat*. Jakarta: Bina Rena Pariwisata.
- Habermas, J. (1984). *The theory of communicative action* (T. McCarthy, Trans.). Boston: Beacon Press.
- Habib, M. A. F. (2021). Kajian teoritis pemberdayaan masyarakat dan ekonomi kreatif. *Journal of Islamic Tourism, Halal Food, Islamic Traveling, and Creative Economy*, 1(2), 106–134. <https://doi.org/10.21274/ar-rehla.v1i2.4778>
- Hamid, H. (2018). *Manajemen pemberdayaan masyarakat*. Makassar: De La Macca (Anggota Ikapi Sulse).
- Handayani, P., Purwanti, Y., & Nirwana, N. Q. S. (2020). Edukasi kemandirian ekonomi perempuan sebagai basis dakwah Aisyiyah. *Prosiding University Research Colloquium*, 163–167.
- Harahap, Z. N., Azmi, N., Wariono, W., & Nasution, F. (2023). Motivasi, pengajaran dan pembelajaran. *Journal on Education*, 5(3), 9258–9269. <https://doi.org/10.31004/joe.v5i3.1732>
- Hasibuan, A. F. H., Nur, M. M., & Ichsan, I. (2022). Faktor-faktor yang mempengaruhi kemandirian ekonomi pondok pesantren. *El-Amwal*, 5(2), 1. <https://doi.org/10.29103/el-amwal.v5i2.8773>
- Hasibuan, S. (2022). Atensi masyarakat terhadap aktivitas penyelenggaraan jenazah. *Bidayah: Studi Ilmu-Ilmu Keislaman*, 13(2), 219–229. <https://doi.org/10.47498/bidayah.v13i2.900>
- Hijratullah, M. S. (2021). Pemberdayaan perempuan dalam pemerataannya di lingkungan. *Universitas Lambung Mangkurat Banjarmasin*. <https://doi.org/10.31219/osf.io/dterx>
- Ibn Khaldun, A. A. M. (2001). *Mukaddimah*. Jakarta: Pustaka Al-Kautsar.
- Ingham, J. (2007). *Strategic human capital management: Creating value through people*.
- International Monetary Fund. (2020). *International financial statistics (IFS)*. <https://data.imf.org>
- Ishomuddin. (2002). *Pengantar sosiologi agama*. Jakarta: Ghalia Indonesia & Universitas Muhammadiyah Malang Press.
- Jabeen, S., Haq, S., Jameel, A., Hussain, A., Asif, M., Hwang, J., & Jabeen, A. (2020). Impacts of rural women's traditional economic activities on household economy: Changing economic contributions through empowered women in rural Pakistan. *Sustainability (Switzerland)*, 12(7), 1–23. <https://doi.org/10.3390/su12072731>
- Juliyanto, M. S., Raa, S., Fatkhurrozi, M., Abadi, M. T., & Syaffi'i, M. A. (2024). Sejarah pemikiran ekonomi neo-klasik, kapitalisme, sosialisme, dan Keynesian. *Jurnal Ilmiah Research Student*, 1(3), 377–385. <https://doi.org/10.61722/jirs.v1i3.610>
- Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, 30(3), 435–464. <https://doi.org/10.1111/1467-7660.00125>
- Kabeer, N. (2005). Gender equality and women's empowerment: A critical analysis of the third Millennium Development Goal. *Gender & Development*, 13(1), 13–24. <https://www.jstor.org/stable/20053132>
- Kamali, M. H. (2015). *The middle path of moderation in Islam: The Qur'anic principle of wasatiyyah*. Oxford: Oxford University Press.
- Karl, M. (1995). *Empowerment and women*. London: Zed Books.
- Kementerian Agama RI. (2010). *Al-Qur'an dan tafsirannya* (Edisi yang disempurnakan, Jilid 10). Jakarta: Kementerian Agama RI.
- Khoirunnisa, V., & Suharso, P. (2022). Pemberdayaan perempuan melalui pelatihan membatik di Perpustakaan Pustaka Sakti Desa Gemeksekti Kabupaten Kebumen. *Anuva: Jurnal Kajian Budaya, Perpustakaan, dan Informasi*, 6(3), 293–306. <https://doi.org/10.14710/anuva.6.3.293-306>
- Khoriddin. (2019). *Pembangunan masyarakat*. Yogyakarta: Liberty.
- Kodir, F. A. (2012). *Al-sa'āda fī usus ḥusn al-mu'āshara fī ḥayāt al-zawjīyah*, Sittin al-Adliyyah, Nabiyyu ar-Rahmah. Cirebon: Institut Studi Islam Fahmina (ISIF) & Fahmina Institute.
- Kodir, F. A. (2019). *Qira'ah mubaadalah: Tafsir progresif untuk keadilan gender dalam Islam*. Yogyakarta: IRCiSoD.
- Labiba, Z., Afifah, S., Tambak, H. N., & Kalijaga, U. I. N. (2021). Pendekatan sosiologi dalam kajian pendidikan Islam. *Jurnal Pendidikan Indonesia (Japendi)*, 2(11), 1987–1998. <https://doi.org/10.59141/japendi.v2i11.341>
- Latipah, I. (2020). Pemberdayaan perempuan melalui pemanfaatan media YouTube dalam meningkatkan keterampilan wirausaha. *Comm-Edu (Community Education Journal)*, 3(2), 83. <https://doi.org/10.22460/comm-edu.v3i2.4150>
- Levine, M. (2012). *Teach your children well: Parenting for authentic success*. Harper Perennial.

- Lince, L. (2022). Implementasi kurikulum merdeka untuk meningkatkan motivasi belajar pada sekolah menengah kejuruan pusat keunggulan. *Prosiding Seminar Nasional Fakultas Tarbiyah dan Ilmu Keguruan IAIM Sinjai*, 1(1), 38–49. <https://doi.org/10.47435/sentikjar.v1i0.829>
- Machendrawaty, N., & Syafe'i, A. A. (2001). *Pengembangan masyarakat Islam: Dari ideologi, strategi sampai tradisi*. Bandung: Rosda Karya.
- Mardikanto, T. (2013). *Pemberdayaan masyarakat*. Surakarta: UNS Press.
- Masykur, H., & Widjaya, T. (2003). *Model masyarakat madani*. Jakarta: Intimedia Cipta Grafika.
- Misbahul, U. (2020). Dakwah perubahan masyarakat; Qur'anic perspective. *Unisnu*, 41–55.
- Misjaya, et al. (2019). Konsep pendidikan kemandirian ekonomi di Pondok Pesantren Mukmin Mandiri Sidoarjo-Jawa Timur. *Jurnal Pendidikan Islam*, 8(1), 94.
- Moleong, L. J. (2001). *Metodologi penelitian kualitatif* (8th ed.). Bandung: PT Remaja Rosdakarya.
- Muhammad, H. (2001). *Fiqh perempuan: Refleksi kiai atas wacana agama dan gender*. Yogyakarta: LKIS.
- Mustaqim, I. (2020). Pengaruh kompetensi dosen, kurikulum dan motivasi terhadap prestasi belajar mahasiswa. *Reslaj: Religion Education Social Laa Roiba Journal*, 1(1), 63–75. <https://doi.org/10.47467/reslaj.v1i1.67>
- Mutmainah, N. (2020). Peran perempuan dalam pengembangan ekonomi melalui kegiatan UMKM di Kabupaten Bantul. *WEDANA: Jurnal Kajian Pemerintahan, Politik dan Birokrasi*, 6(1), 1–7. [https://doi.org/10.25299/wedana.2020.vol6\(1\).4190](https://doi.org/10.25299/wedana.2020.vol6(1).4190)
- Nainggolan, P. P. (2021). *Transisi dan kandasnya konsolidasi demokratis pasca-Soeharto* (1st ed.). Jakarta: Yayasan Pustaka Obor Indonesia.
- Nazir, M. (2005). *Metode penelitian*. Bogor: Ghalia Indonesia.
- Novitasari, A. (2021). Pengaruh pemberdayaan perempuan terhadap ketahanan perekonomian keluarga. *Lifelong Education Journal*, 1(2), 139–144. <https://doi.org/10.59935/lej.v1i2.33>
- Nugroho, A. C. (2021). Teori utama sosiologi (fungsionalisme struktural, teori konflik, interaksi simbolik). *Majalah Ilmiah Semi Populer Komunikasi Massa*, 2(2), 185–194. <https://portal-ilmu.com/teori-utama-sosiologi/>
- Nuraeni, Y., Yuliasuti, A., Nasution, F. A., Muharam, A. S., & Iqbal, F. (2022). Peran Balai Latihan Kerja (BLK) komunitas dalam menyediakan tenaga kerja pada dunia usaha dan industri. *Jurnal Ketenagakerjaan*, 17(1). <https://doi.org/10.47198/naker.v17i1.124>
- Nurdin, I., & Hartati, S. (2019). *Metodologi penelitian sosial*. Surabaya: Media Sahabat Cendekia.
- Palulungan, L., Khordi, G. H., & Ramli, M. T. (2020). *Perempuan, masyarakat patriarki, dan kesetaraan gender*. Makassar: Yayasan Bursa Pengetahuan Kawan Timur Indonesia.
- Pangesti, W. A., Fanani, A., & Prastyo, D. (2020). Pengaruh model project-based learning terhadap motivasi belajar siswa. *Buana Pendidikan: Jurnal Fakultas Keguruan dan Ilmu Pendidikan*, 16(30s), 27–32. <https://doi.org/10.36456/bp.vol16.no30s.a2753>
- Raco, J. (2010). *Metode penelitian kualitatif: Jenis, karakteristik, dan keunggulannya*. Jakarta: Grasindo.
- Rahardjo. (2020). *Pengantar sosiologi pedesaan*. Yogyakarta: Gadjah Mada University Press.
- Riva'i, F. A., & Sumartono, R. (2022). Peran program life skill terhadap kemandirian santri di Pesantren Pemberdayaan Ummat An-Nahl Pamijahan Bogor. *Jurnal Tadbiruna*, 1(2), 90–98. <https://doi.org/10.51192/tadbiruna.v1i2.276>
- Rosdianty, L., & Chrystianto, B. M. (2022). *Pembangunan manusia berbasis gender 2021*. Kementerian Pemberdayaan Perempuan dan Perlindungan Anak.
- Sailah, I. (2008). *Pengembangan soft skills di perguruan tinggi*. Jakarta: Direktorat Jenderal Pendidikan Tinggi, Departemen Pendidikan Nasional.
- Sasongko, R. W. (2022). *Strategi penguatan ekonomi pedesaan di Indonesia*. Cv Cendekia Press.
- Satori, D., & Komariah, A. (2024). *Metodologi penelitian kualitatif*. Bandung: Alfabeta.
- Schultz, T. W. (1961). *Investment in human capital*. *American Economic Review*.
- Sen, A. (1999). *Development as freedom*. Oxford University Press.
- Shihab, M. Q. (2002). *Tafsir Al-Mishbah: Pesan, kesan, dan keserasian* (Vol. 4). Jakarta: Lentera Hati.
- Silahuddin, A. (2022). Manajemen lingkungan sosial pendidikan di MA Al-Huda Karang Melati sebagai pendukung pembelajaran bahasa Arab siswa. *Idaaratul 'Ulum: Jurnal Prodi MPI*, 4(1), 33–46. <https://jurnal.stitmugu.ac.id/index.php/idaarotul/article/view/362>
- Soekanto, S. (2019). *Sosial suatu pengantar*. Jakarta: Rajawali Press.
- Sunardi, S., & Sohib, S. (2020). Implementasi manajemen kewirausahaan dalam meningkatkan life skill santri di Pondok Pesantren Fathul Ulum Diwek Jombang. *Al-Idaroh: Jurnal Studi Manajemen Pendidikan Islam*, 4(2), 210–226. <https://doi.org/10.54437/alidaroh.v4i2.167>
- Suryatini, L., & Wiyani, N. A. (2023). Pemberdayaan masyarakat melalui bimbingan pelatihan membuat di PKBM Marsudi Karya bidang pengembangan kewirausahaan. *Al-Ihtiram: Multidisciplinary Journal of Counseling and Social Research*, 2(2), 61–82. <https://doi.org/10.59027/alihtiram.v2i2.434>
- Sutopo, H. B. (2006). *Metodologi penelitian kualitatif: Dasar teori dan terapannya dalam penelitian*. Surakarta: Universitas Sebelas Maret.

- Syafruddin, A., Nahas, J. E., & Nahas, C. (2023). Optimalisasi peran lembaga pemberdayaan masyarakat dalam pemberdayaan ekonomi masyarakat di Desa Ajaobaki Kabupaten Timor Tengah Selatan. *Jurnal Administrasi Negara*, 1(2), 119–129.
- Tahar, A., Setiadi, P. B., & Rahayu, S. (2022). Strategi pengembangan sumber daya manusia dalam menghadapi era revolusi industri 4.0 menuju era society 5.0. *Jurnal Pendidikan Tambusai*, 6(2), 12380–12394. <https://doi.org/10.31004/jptam.v6i2.4428>
- Tamba, W., Rizka, M. A., & Andriani, I. (2020). Implementasi pendidikan masyarakat melalui pemberdayaan perempuan berbasis life skill education. *Jurnal Paedagogy*, 7(3), 237. <https://doi.org/10.33394/jp.v7i3.2745>
- Ulinuha, E. R., & Mizani, Z. M. (2023). Peranan Muslimat Nahdlatul Ulama dalam pemberdayaan perempuan pada bidang sosial keagamaan. *Ma'alim: Jurnal Pendidikan Islam*, 4(1), 113–129. <https://doi.org/10.21154/maalim.v4i1.7040>
- Ulum, M. N. A.-R. (2007). Ringkasan tafsir Ibnu Katsir (Jilid 2, Cetakan Ke-2). Jakarta: Gema Insani.
- Umer, C. (2001). Masa depan ilmu ekonomi: Sebuah tinjauan Islam. Jakarta: Gema Insani Press.
- Utami, R. W., & Afrizal, S. (2022). Implementasi pemberdayaan perempuan melalui program peningkatan peranan perempuan menuju keluarga sehat sejahtera di Kelurahan Kepuh. *Jurnal Pendidikan Sosiologi dan Humaniora*, 13(2), 738. <https://doi.org/10.26418/j-psh.v13i2.54679>
- Wahbah, A.-Z. (1986). *Ushul al-Fiqh al-Islami*. Damaskus: Dar al-Fikr.
- Wrihatnolo, R. R., & Dwidjowijoto, R. N. (2007). *Manajemen pemberdayaan* (1st ed.). Jakarta: PT Elex Media Komputindo.
- Wulandari, N., Indrianti, D. T., & Hilmi, M. I. (2022). Analisis gender peran perempuan pesisir pada ketahanan keluarga di Desa Puger Kulon Kabupaten Jember. *Jurnal Cendekiawan Ilmiah PLS*, 7(1), 52–60. <https://doi.org/10.37058/jpls.v7i1.4758>
- Yuliantri, R. D. A. (2021). Menelusuri wacana kemandirian ekonomi di Indonesia (1920-1965). *Jurnal Pendidikan dan Sejarah*, 7(1), 68–75. <https://doi.org/10.30870/candrasangkala.v7i1.11383>
- Yuniawati, R. A. (2021). Pemberdayaan perempuan dalam membangun kemandirian ekonomi. *SELAPARANG: Jurnal Pengabdian Masyarakat Berkemajuan*, 5(1), 169–173. <https://doi.org/10.51771/jukeshum.v2i1.175>
- Zakiyuddin, Z., Firzan, F., Yarmaliza, Y., Farsini, T. N., Fitriani, F., Reynaldi, F., Duana, M., & Anwar, S. (2021). Meningkatkan program pemberdayaan perempuan dan keluarga berencana. *Comsep: Jurnal Pengabdian Kepada Masyarakat*, 2(1), 107–112. <https://doi.org/10.54951/comsep.v2i1.62>



Active participation of mothers in plastic recycling activities to improve water quality and reduce environmental pollution

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ABSTRACT

This program investigates active participation of mothers in plastic recycling activities to improve water quality and reduce environmental pollution through the creation of ecobrick. Implemented as a community service program, the initiative followed a structured approach encompassing observation, education, assistance, and evaluation stages. The program aimed not only to minimize plastic waste but also to empower residents with skills and knowledge for sustainable environmental management. Throughout the program, participants showed high levels of enthusiasm and engagement, actively collecting and compacting various types of plastic waste into ecobrick. The program outcomes indicate significant gains in both technical competencies related to ecobrick production and increased environmental awareness among participants, fostering a sense of ecological responsibility and community collaboration. Evaluation results demonstrate the program's effectiveness in reducing the amount of unmanaged plastic waste and contributing to a cleaner neighborhood environment. This success also supports the broader goal of Sustainable Development Goal (SDG) 6, specifically focusing on clean water and sanitation by addressing pollution sources within the community. The findings underscore the potential of community-led initiatives in achieving sustainable environmental impact, suggesting the scalability of this program model to similar urban and suburban areas facing plastic pollution challenges.

Kata Kunci

Air bersih

Ecobrick

Evaluasi

Pengabdian masyarakat

Polusi

Partisipasi aktif ibu-ibu dalam kegiatan daur ulang plastik untuk meningkatkan kualitas air dan mengurangi pencemaran lingkungan. Program ini mengkaji partisipasi aktif ibu-ibu di RW 10, Kelurahan Binong, Tangerang, dalam kegiatan daur ulang plastik yang bertujuan untuk mengurangi polusi lingkungan dan meningkatkan kualitas air melalui pembuatan ecobrick. Dilaksanakan sebagai program pengabdian masyarakat, inisiatif ini mengikuti pendekatan terstruktur yang mencakup tahapan observasi, edukasi, pendampingan, dan evaluasi. Program ini tidak hanya bertujuan untuk meminimalkan sampah plastik, tetapi juga untuk memberdayakan warga setempat dengan keterampilan dan pengetahuan dalam pengelolaan lingkungan yang berkelanjutan. Selama program berlangsung, partisipan menunjukkan antusiasme dan keterlibatan yang tinggi dalam mengumpulkan dan memadatkan berbagai jenis sampah plastik menjadi ecobrick. Hasil program menunjukkan peningkatan yang signifikan dalam kompetensi teknis terkait produksi ecobrick dan peningkatan kesadaran lingkungan di kalangan peserta, sehingga menumbuhkan rasa tanggung jawab ekologis dan kolaborasi dalam komunitas. Hasil evaluasi membuktikan efektivitas program ini dalam mengurangi jumlah sampah plastik yang tidak terkelola dan berkontribusi pada lingkungan yang lebih bersih di wilayah tersebut. Keberhasilan ini juga mendukung pencapaian Tujuan Pembangunan Berkelanjutan (TPB) 6, khususnya terkait air bersih dan sanitasi, dengan menangani sumber polusi di lingkungan masyarakat. Temuan ini menegaskan potensi inisiatif yang dipimpin oleh masyarakat dalam mencapai dampak lingkungan yang berkelanjutan, serta menyarankan bahwa model program ini dapat diadaptasi untuk daerah perkotaan dan pinggiran kota lain yang menghadapi tantangan polusi plastik serupa.

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INTRODUCTION

Nature has always been giving the resources that every living being needs, so that humans as God's creation, are given the privilege to think rationally, and the cultural mandate to manage and preserve the earth. As time progresses, population density causes several problems for nature. One of which is the usage of single-use plastics (Rafi & Perkasa, 2023). 53% of plastics that are made of flexible materials are produced into food wrappers; while the rigid ones are turned into drink containers (Nasution, 2015).

Typically, plastic is favored for its distinguished qualities, such as being light weight, free from rust, sturdy and malleable, effective in electrical isolation, dyeable and can be made transparent, as well as its cheap process costing (Praharjo, et al., 2022). In line with that, most of people likes used the plastic bag because of attractive in color, lightweight, practical, and easy to carry (Widayat et al., 2022). Plastic is a group of polymer compounds that consist of several different types of monomers in the process of polymerization. The first commercial plastic was made of nitrocellulose, but recently, the most commonly developed and distributed ones are the types of synthetic polymer compounds that are made from crude oil, which is hard to degrade naturally. Carbon and hydrogen are the main chemical constituents of plastic.

The most commonly found types of plastic in urban wastes include low-density polyethylene (LDPE), polypropylene (PP), high-density polyethylene (HDPE), polyvinyl chloride (PVC), Polyethylene Terephthalate (PET), and polystyrene (PS) (Evode et al., 2021; Setyowati & Widodo, 2017). PET plastic is commonly produced as plastic bottles; HDPE can be used for plastic bags, juice or shampoo containers, pill bottle; while LDPE can be used in plastic wrappers, food containers, and packaging cover (Hasibuan, 2016). In general, plastic takes a long time to decompose, around 100 to 500 years to be completely decomposed (Ramadani, 2019).

The use of plastic is indeed efficient, but it can have a big negative impact on the environment. The impact of pollution on water and soil will disrupt the ecosystem and have a negative effect on the sustainability of all living things in the environment (Rafi & Perkasa, 2023). Plastic waste is one of the largest types of waste and is classified as being unable to be broken down by microorganisms that live in the environment (Hasibuan, 2016). It is further stated that plastic in water will cause problems in the waters, such as being eaten by aquatic creatures who think the plastic is food (for example, turtles that eat clear plastic because of the resemblance to jellyfishes), microplastics that can be mistaken for plankton by other animals in the waters, and even the dangerous chemicals that make up the plastic can break down and enter the water, becoming poison (Hasibuan, 2016) which can cause pollution and kill aquatic animals (Ramadani, 2019).

Water is one of the most important natural resources for the life of every living thing in the world. The need for clean water can support the life of all living things, not only for animals that live in water, but also every living thing that lives in water and on land. In several locations in Tangerang, especially in the Binong Village area, plastic waste management is still considered inappropriate. Many residents still throw garbage in water channels, on the side of the road, and even in other open places. In addition to littering, many residents also choose to burn the garbage, which produces smoke and pollutes the air.

This condition concerns the residents of the complex who live side by side with the Binong area so that the TMD (Tim Mitra Daerah), UPH and Binong Village agreed to create an activity that could handle the problem safely and appropriately. Handling the problem is done by recycling plastic waste into certain products that can be used. One way is to make ecobrick. The origin of the word is from the word eco "nature" and brick. Ecobrick can be explained as the packaging of clean used plastics and compacted in bottles (containers) to a certain density, which can then be used as building materials by arranging the ecobrick like brick blocks (Ramadani, 2019)

Plastic waste that is difficult to degrade, is often found piled up on the ground and around water channels can be a problem for the environment. Therefore, the activity of recycling plastic into ecobrick is carried out in the Pengabdian kepada Masyarakat (PkM, in English "Community Service") program or community service as an alternative solution that can be done to reduce the accumulation of plastic waste in the environment around RW 10, Binong Village. Several points measured in this community service activity are the active participation of Binong Village's women in recycling activities which are assessed using questionnaires and attendance. This community service program was held by involving the women of RW 10 Subdistrict Binong and Binong regional government. The program is supported by the Faculty of Education of UPH Tangerang. The goals of this PkM are: (1) To observe the active participation of the women of RW 10, Binong Subdistrict in this PkM activity, (2) To recycle every type of plastics and plastic bottle to be an ecobrick, and (3) Through this community service program, to provide more opportunities for civils at Binong area with good health and reach a better environment to live in.

It is hoped that through this community service activity, each participant can provide a solution to the use of single-use plastics that accumulate at home, commit to not throwing away plastic waste by recycling it into ecobrick, and enhancing water quality by reducing pollution in the environment to support efforts to improve SDG (Sustainable Development Goal) number 6 regarding clean water and proper sanitation.

METHOD

The community service activities in the form of recycling or recycling plastic waste into ecobrick products are carried out using the workshop method. The subjects and places of this community service activity are women in RW 10, Binong Village, Tangerang. The stages carried out in this community service are 1) Observation and identification stage of problems submitted by partners (TMD and Binong Village); 2) Preparation stage carried out by submitting proposals and submitting permits to the campus and

the Village; 3) Education stage; 4) Assisting stage; and 5) Evaluation stage (Figure 1).



Figure 1. Community Service stages.

In the first stage, the community service team conducted observations and identified problems in Binong Village. Stage 1 was conducted once in the Forum Group Discussion session. In the Observation stage, the PkM team can also observe the environment that is the target for holding this community service (Aryana et al., 2023). When conducting field observations, it was seen that a lot of garbage was thrown away and scattered around the residents' settlements, village halls, and in the gutters, which is our main concern. In the second stage, which is the preparation and writing of the proposal, was carried out as a form of follow-up to the problems found in the field. Then in the third stage, coordination was carried out to plan and finalize the schedule for this community service activity.

The fourth stage is the stage of educating the community. At the education stage, the PkM team also provides a live demonstration of the ecobrick making process so that participants can directly understand the methods and stages in implementing ecobrick. It is also ensured that the groups would be sitting in circle formations in order to help maintain eye contact, discussion, and information processing, which is helpful to the active participation and engagement by the participants (St. Onge & Eitel, 2017). After the education stage, the next stage is the assisting stage as the fifth stage. The sixth and final stage in this activity is evaluation. Evaluation in the form of questionnaire data collection is carried out 2 times, namely at meeting 2 after the assisting stage and meeting 3 during product assessment.

The data collection method is carried out by calculating questionnaire data and product and activity assessment rubrics. A questionnaire is a research instrument in the form of questions addressed to respondents to be answered freely, according to their opinions (Ernawati & Setiawaty, 2021). In line with that, a questionnaire is a data collection technique consisting of questions that must be answered in order to obtain subjective information from respondents (Nugroho, 2022). Questionnaires and questionnaires are data collection tools or instruments that are both taken in an activity. Thus, a questionnaire is the use of a written question instrument that must be answered to obtain subjective information from the community. The data generated from administering the questionnaire is in the form of qualitative data. Sources of qualitative data collection consist of words, community activities, and documentation in the form of photos taken during the activity. Qualitative data can be used to measure the quality of the event to participant satisfaction with the event.

The questionnaire was designed to measure the level of active participation and response of the participants towards this community service activity. The aim was to obtain constructive feedback for future improvements. The Likert scale was used in this questionnaire, which allowed the participants to state their opinions through four answer choices, namely: SA (strongly agree), A (agree), DA (disagree), and SDA (strongly disagree). The use of the Likert scale allows for a more in-depth analysis of the participants' perceptions and satisfaction with the workshop. The data obtained from this questionnaire will be processed to obtain a clear picture of the effectiveness and impact of the activities that have been carried out. Thus, this workshop not only functions as a forum for community empowerment, but also as a means to improve the quality of interaction and social activities in the RW 10 environment, Binong Village.

The next instrument is the product assessment rubric. The assessment rubric used in this community service activity is a measuring tool to assess the products that have been worked on by residents. Rubric is an objective assessment instrument, containing gradations of values, criteria, and aspects that help students produce higher quality performance (Lase & Nababan, 2023). Rubric is an effective alternative assessment currently used to assess student or participant performance which can cover three aspects, namely cognitive, affective and psychomotor (Tangkin, 2019). Based on the opinions of experts, it is concluded that the rubric is an effective assessment instrument to measure participant performance that can be taken and carried out objectively because the assessment is carried out based on the reference criteria in the rubric for the products worked on.

This PkM was held from March to June 2024. The schedule and details of the activities are outlined in Table 1. This community service was attended by women in RW 10, Binong Village. Participants consisted of various elements of society, including RW (Rukun Warga) women, RT (Rukun Tetangga) women, and the local women. Each meeting in the series of Community Service (PkM) activities was evaluated systematically using a questionnaire distributed to all participants.

Table 1. Workshop schedule and details

No.	Schedule	Events
1	Meeting 1	- Team introduction and socialization of ecobrick - Education Stage: Collection of plastic packaging and plastic bottles
2	Meeting 2	Assisting stage: - Education Stage: Collection of plastic packaging and plastic bottles - Making and production of the ecobrick
3	Meeting 3	- Evaluation Stage: Completion of the ecobric - Product assessment and competition

RESULTS AND DISCUSSION

In the second week, the community service activities focused on the assisting stage in the ecobrick making process, where local women were directed to bring plastic waste and plastic bottles that had been collected from their house environments. Handling plastic waste by making ecobrick has also been carried out in Pemogan Village (Suidarma & Antini, 2023). The manufacture of ecobrick has been done a lot and can be one of the answers to reduce plastic waste in the environment (Bermuli et al., 2023). Before starting, the assisting team explained the important procedure of compacting plastic waste into bottles until they were completely full and solid to produce quality ecobrick that meet standards. The women's enthusiasm for this activity was palpable, bringing various types of plastic, such as food wrappers, plastic bags, and used beverage bottles. Each participant was carefully guided in filling the bottles with plastic, using simple tools such as small sticks or wood to help compact the contents of the bottles to the maximum (Bermuli, et al., 2023). During the activity, the women were encouraged to discuss the challenges they faced in the process of collecting and compacting waste, as well as sharing their experiences about waste management in their own households. This activity not only serves to improve technical skills in making ecobrick but also strengthens ecological awareness and develops a spirit of cooperation among local women, who play an important role in environmental conservation efforts in their villages. This can be done to reduce the serious impact of plastic waste pollution which can be a pollutant for the environment, especially water and soil (Rafi & Perkasa, 2023). This PkM, which is titled as "Active Participation of Mothers in Plastic Recycling Activities to Improve Water Quality and Reduce Environmental Pollution" was carried out in several stages of activity with the following details:

Observation and Identification of the Problem

Stage 1 was conducted by observing and identifying problems in Binong Village through 2 methods, namely 1) interviews conducted with the Village Head, Village Secretary, and Family Empowerment and Welfare (PKK, Pemberdayaan dan Kesejahteraan Keluarga) administrators in Binong Village, Tangerang. Then, 2) direct observations were conducted in the RW 10 area, Binong Village, Tangerang to obtain concrete data. After the observation activities were carried out, the team identified the problems and formulated the problems that had been seen during the Village team interview process in the Forum Group Discussion (FGD) and observation activities. The Village Team and PT. Tata Mandiri Daerah Lippo Karawaci (TMD, Township Management Division) worked together to create shared prosperity as fellow residents who live close together. This is due to the anxiety of the housing residents regarding improper waste management. Residents who live side by side with the Lippo Barat housing complex are often found burning garbage until the smoke disturbs the housing complexes nearby. This can trigger health problems if it is allowed to continue.

Diseases that can be suffered by the community if they are continuously exposed to smoke from burning garbage are respiratory disorders (asthma, bronchitis, and pneumonia), chronic obstructive pulmonary disease (COPD), acute respiratory infection (ARI), cardiovascular disease (stroke and heart), fetal development disorders, and decreased lung function (Maharani & Aryanta, 2023). Based on the data and information, the most common diseases suffered are diseases related to the respiratory organs. This is because burning waste will produce residue in the form of highly concentrated smoke that can pollute the environment. Therefore, the problem of plastic waste management is a problem that needs to be followed up immediately. The purpose of TMD is to maintain and clean the environment, maintain road and channel infrastructure, provide consumer services, and provide transportation services in the Lippo Village area. Thus, to achieve this goal, TMD invites Binong Village and Pelita Harapan University (UPH) to work together to find solutions to the plastic waste problem that occurs around the Binong Village area.

Preparation and Writing of the Proposal

The second stage of the community service series carried out is the preparation and writing of the proposal for this activity. The entire team prepared literature to write a draft of the community service proposal. The proposal is a draft of a research proposal conducted by a researcher on the research material to be conducted. The draft of a research activity proposal requires the approval of other parties before the research activity is carried out (Khoiriyati et al., 2022). According to KBBI (Badan Pengembangan dan Pembinaan Bahasa (Pusat Bahasa), 2024), a proposal is a research plan that is realized in the form of a systematic, complete, and thorough activity plan that is designed before the research is conducted. Thus, the proposal is a document containing a draft of activities that will be carried out and requires approval from other parties before the research activity is carried out. In addition to containing details of the activities to be carried out, the proposal also contains details of the budget expenditures needed during the research. A proposal is made to obtain approval from the parties involved during the research, so that the entire contents of the proposal must be understood by the approving party. The community service proposal then became an official document for UPH and Binong Village in working together to find solutions and solve the problem of plastic waste in the environment. Ecobrick is one way that can be done to reduce plastic waste in the environment to maintain environmental cleanliness from polluting agents (Bermuli et al., 2023).

In addition, the writing of the activity proposal is carried out to apply for permission and funding from UPH regarding this activity. After the submission of the activity proposal is approved, the team coordinates with the Binong Village. This activity is the third stage of the community service activity process that is carried out. The writing of the proposal contains the background of the activity and the objectives to be achieved by the UPH and Binong Village PkM team members. In addition, the proposal

also contains details of the method, assessment rubric, questionnaire, activity agenda, and the funds that will be used in this program. The results or outputs of this activity are also written in the activity proposal.

Coordination with the Related Parties

The coordination stage with the related parties included the preparation of the activity agenda, determination of the material to be delivered, and preparation of the facilities and infrastructure needed during the process of carrying out activities in the field. The coordination stage is carried out by involving several parties, such as the Binong Village Team, PKK Management, Head of the RW 10, Secretary, mothers who live in the RW 10 area, UPH students, and members of the community service team. The division of roles and responsibilities for the activity is the Binong Village Team, a leader from that area and RW 10 Secretary as Activity Supervisors, PKK Management and women in the RW 10 area as activity participants, UPH students as group facilitators, Head of the community service activity served as the speaker and competition judge, members of the PkM team also served as competition jury team and field supervisors. Good coordination is needed between the campus and local residents. Because this problem comes from environmental problems in the area where they live, it requires the cooperation of residents to be able to find the right solution. This is because the community needs to be involved in decision-making and the implementation of activities that can improve the quality of the environment around them (Fatmawaty et al., 2020).

Education for the Local Community

The community education activity began with a welcoming speech and opening by the RT (Figure 2A). Education is an interactive process where an educator or presenter would deliver some materials to the participants (Pasalina et al., 2023). After the opening activity, it was proceeded with the presentation of material by the PkM team (Figure 2B). During the education activity, participants will follow a series of detailed explanations regarding the background of the activity, the impact of plastic waste on the environment, how to reduce the amount of plastic waste, the origin of ecobrick, functions, techniques, the processes of making, and the expected results of the community service activities carried out (Figure 2). Residents were explained about the impact of plastic waste pollution because plastic waste is one of the inorganic waste that cannot be degraded in nature (Putra & Yuriandala, 2010). Details of the ecobrick making process regarding how to select materials, prepare, and manage plastic waste properly, were also explained during the education session given to participants. The PkM team also showed examples of ecobrick products that had been made and could be used as useful products in everyday life.



Figure 2. The education stage for the residents of RW 10, Binong. A) Opening by the RT head; 2) Explanation of the material for the benefits and how to make ecobrick.

At this education stage, the women of RW 10 were taught about the impact of littering single-use plastic waste. If thrown away carelessly, for example on the ground or in the gutter, it will cause environmental pollution and water pollution. Based on Figure 1, the chemical structure of each type of plastic is quite different. If plastic is not processed properly, it will have a bad effect on all living things. The nature of plastic that is not easily decomposed will become a dangerous pollutant in the soil and in water areas. Therefore, making ecobrick can be a positive alternative to reducing the use of single-use plastic and plastic bottles. In the education stage, every piece of information about ecobrick is delivered to people who live in RW 10, Binong, Tangerang. The making of ecobrick aims to raise environmental awareness and reduce plastic pollution, to keep the environment clean and help reduce water pollution that can cause a clean water crisis. This activity is designed to educate participants about the negative impacts of plastic on land and water, as well as how every community can contribute to solving the problem of water pollution caused by plastic waste (Bermuli et al., 2023; Suidarma & Antini, 2023).

Education stage begins with preparation of tools and material that we used in this workshop. Preparation tools and materials are significantly important for every situation (Sine et al., 2023). During the education stage, participants received information on how to make ecobrick. The ecobrick making technique starts from 1) selecting the plastic bottles to be used, 2) cleaning the bottles that have been sorted by washing the inside of the bottle thoroughly with water or with soapy water for plastic bottles containing water containing sugar, 3) drying using a dry cloth, 4) chopping each cleaned and dried plastic food wrap into about 1-2 cm in size, 5) inserting flexible and fairly thin plastic such as plastic bags into the bottle, 6) pushing the plastics with a wooden stick until it occupies the bottom of the bottle, 7) inserting pieces of plastic food wrap, 8) repeating and pushing with a wooden stick until the bottle becomes solid and does not enter when pressed on the surface of the bottle or is sturdy when the bottle is stepped on, 9) weighing each filled bottle and making sure it reached the specified volume, 10) the ecobrick is ready to be used

for various purposes. The steps have been modified from several resources (Bermuli et al., 2023; Ramadani, 2019; Suidarma & Antini, 2023). Ecobrick can be used as a substitute for bricks which are one of the elements in building construction. In addition, ecobrick can also be used for other purposes, such as small chairs, mini sofas, shoe racks, flowerpots, and so on.

Assisting

The assisting stage is a stage carried out by the PKM team to see the progress of the ecobrick project of each team. In the assisting process, the college students were given the opportunity to help the women in working on the ecobrick. At this stage, the community team can weigh the finished ecobrick and re-evaluate them. If it was done correctly and filled the bottle according to its size, it will be given a weight label and marked. Even for bottles that were labeled as approved, it was still necessary to re-evaluate the density of the contents in the bottle. This was done to ensure the ecobrick bottle would remain sturdy and filled. At this stage, students also help with the process of cutting the plastics, inserting the plastic bits into the bottle, compacting them with wooden sticks, then weighing the ecobrick (Figure 3). At the mentoring stage, the community continues to be reminded to care about the environment and participate in the fight against plastic waste. This is because environmental issues have a direct impact on the people who live and live in the area. In addition, it is said that the issue of plastic waste generally has a very significant impact on every resident living in the area (Rusdiono et al., 2023). After that, when closing the assisting stage, the PKM team reminded the community team to plan the final product of the ecobrick that had been worked on.



Figure 3. Stage of assisting the residents of RW 10, Binong in the activity of making ecobrick

Evaluation of the Products and Closing

The product assessment and closing stages are the final stages of a series of ecobrick making activities at RW 10, Binong. At this stage, the resulting product will be assessed using an assessment rubric with the criteria listed in Table 2. Rubric is a tool or instrument that is used as a reference in the assessment of an activity (Mahmudi, 2018). There are 4 criteria that are assessed for the ecobrick products carried out by the community team. The criteria include correspondence with the goal, creativity, appearance, and teamwork. The PKM lecturer team will act as judges in this product evaluation stage. At this stage, there are 4 groups of residents who will compete and there are 4 lecturers assessing them. Each lecturer assesses 2 groups so that there is no element of subjectivity in the evaluation (Figure 4). Each evaluation results would then be collected, then added up and then divided by 2. As a result, the highest score will emerge as the winner of the product competition that was worked on. This assessment rubric is carried out to be able to motivate residents to be able to work on each ecobrick properly and carefully. Because residents and the environment are two components that cannot be separated, so when working and managing waste, residents need to do their work properly to fulfill their rights and obligations (Kewengian, 2019).

Table 2. The rubric of evaluation of ecobrick

Criteria	Score		
	3	2	1
Correspondence with the goal	The product corresponds to its purpose and needs, proved useful	The product corresponds to its purpose	The product does not correspond to its purpose
Creativity	The product is based on original, innovative ideas and is made from environmentally friendly materials.	The product is based on a modified idea	The product imitates a concept that already exists, nothing new
Appearance	Impressive, well-structured, and sturdy	Impressive; there are fewer sturdy parts	Less impressive and less sturdy
Teamwork	All group members work together and are enthusiastic in completing the work	Some group members do not appear to be working together on the product	No teamwork, the product is done individually

Note: 3 = Very satisfactory; 2 = Satisfactory; 1 = Unsatisfactory



Figure 4. Product evaluation of the ecobrick made by the teams of residents of RW 10, Binong

At the product assessment stage, several community teams still had difficulty working on the final part of the product. This is because the denser the ecobrick, the harder it is to push the plastic pieces into the bottle. This caused the ecobrick activity participants who were around 40 years old and above to need help from the college students as a community service team (Figure 5). At the final stage of making the ecobrick, the cut plastic pieces must fill up to the bottle cap.



Figure 5. Product evaluation of the ecobrick made by the teams of residents of RW 10, Binong.

The evaluation stage is carried out to measure the process of implementing the program carried out. The evaluation stage is carried out by various methods of data collection. Existing data collection techniques, for example in the form of tests, observations, questionnaires, interviews, document and artifact analysis, and monitoring the implementation of program evaluations (Diana, Nizar and Sari, 2023). In this community service activity, the evaluation stage was carried out with several data collection techniques, namely, product presentation, product assessment, and questionnaire filling. The evaluation stage is the stage carried out after the product presentation stage. After the evaluation, one of the college students read the results of the judging. After the winning team was announced, each team of residents was given a prize for the hard work they had done based on the product they had made. Prize giving and documentation are the final sessions in the product assessment stage (Figure 6).



Figure 6. Prize giving based on the ecobrick product made by the teams of residents of RW 10, Binong.

Evaluation

The evaluation stage is a stage carried out to assess the series of activities by collecting questionnaire data. Evaluation needs to be carried out to see the achievement of an activity. Evaluation is carried out in every daily activity, such as in the learning system. Evaluation activities in learning are carried out so that educators are able to assess the learning activities that take place (Musarwan; Warsah, 2022). This community service also needs an evaluation to evaluate everything that already did. The evaluation can be delivered with questionnaire, interview, or even a test. In this community service, the training participants were asked to fill out a questionnaire. In the questionnaire, there are 5 questions. Each question contains an assessment of the active participation of the activity participants (Table 3). Based on the data in Table 3, 15 respondents were asked to choose the answer that best suits their view and experience. The answer choices are SA = Strongly Agree, A = Agree, DA = Disagree, and SDA = Strongly Disagree.

In Question 1, 87% or 13 respondents answered strongly and 13% or 2 respondents answered agree with the statement "I am happy with the activities carried out". Statement 2 regarding "I actively participated during the activities", 87% or 13 respondents answered strongly agree and 13% or 2 respondents answered agree. Statement 3 regarding "I gained a lot of knowledge and skills from the activities carried out", 93% or 14 respondents answered strongly and 7% or 1 respondent answered agree. Statement 4 regarding "I enjoy working in groups", 80% or 12 respondents answered strongly agree and 20% or 3 respondents answered agree. Statement 5 regarding "I am happy to gain knowledge about making ecobrick", 87% or 13 respondents answered strongly agree and 13% or 2 respondents answered agree (Table 3).

Table 3. Result of the questionnaire

No.	Statement	SA (%)	Answer		
			A (%)	DA (%)	SDA (%)
1	<i>Saya senang dengan kegiatan yang dilakukan</i> (I am happy with the activities carried out)	87	13	0	0
2	<i>Saya berpartisipasi aktif selama kegiatan berlangsung</i> (I actively participated during the activities)	87	13	0	0
3	<i>Saya mendapatkan banyak pengetahuan dan keterampilan dari kegiatan yang dilakukan</i> (I gained a lot of knowledge and skills from the activities carried out)	93	7	0	0
4	<i>Saya senang bekerja dalam kelompok</i> (I enjoy working in groups)	80	20	0	0
5	<i>Saya senang mendapatkan pengetahuan mengenai pembuatan ecobrick</i> (I am happy to gain knowledge about making ecobrick)	87	13	0	0

Note: SA = Strongly Agree, A = Agree, DA = Disagree, SDA = Strongly Disagree

The evaluation data of the questionnaire results are visualized using a bar chart shown in Figure 7. The diagram data in Figure 7 is taken based on the results of Table 3. Visualization of the data in Table 3 shows that respondents answered all statements with Strongly Agree and Agree. This can explain that the activities carried out by UPH's PKM team can provide benefits for the residents. In addition, each series of activities also helps residents to actively participate until the closing of the community service activities carried out. Therefore, follow-up activities would be needed in RW 10, which are related to the processing of waste or waste into useful products that support the health of the environment and the local community.

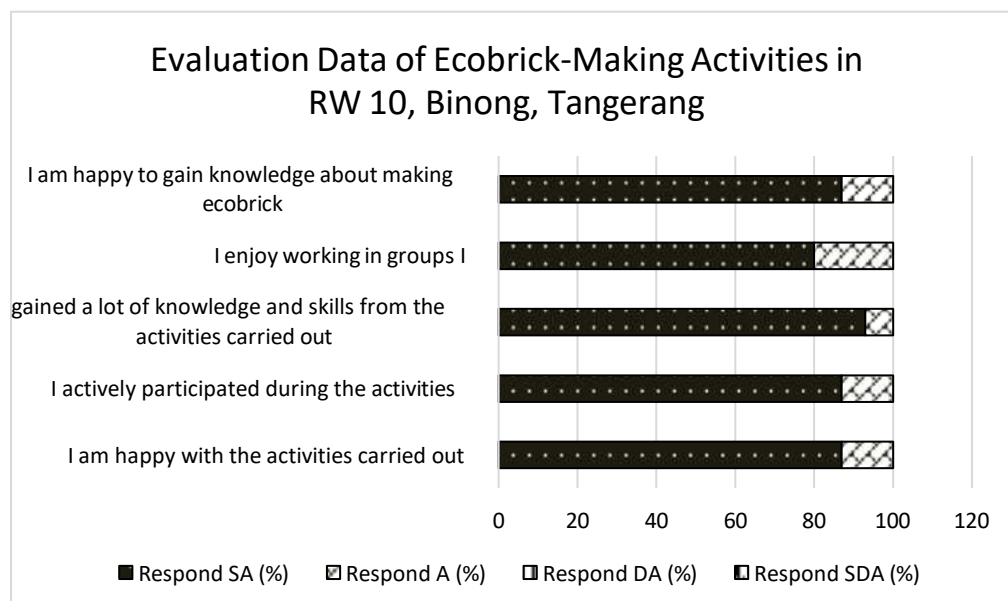


Figure 7. Evaluation data of ecobrick-making activities on RW 10, Binong, Tangerang.

Based on the evaluation results, it can be concluded that all workshop participants felt significant benefits from these activities and the suggestion is the activities are very good to continue to be held regularly. This is in line with the opinion that evaluation activities aim to provide recommendations on the sustainability of an activity based on the data generated (Diana et al., 2023). Participants expressed satisfaction and joy in participating in the series of activities held, especially in gaining new knowledge and skills related to making ecobrick. In addition, at the last meeting of this community service activity, the community service team saw that the area around RW 10, Binong residence, looked clean, and the amount of plastic waste thrown away in their residential environment had decreased significantly. If this activity continues to be carried out sustainably, it can support SDG number 6.3, "By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally." (Indonesia, 2025). The problem of plastic waste will have a great impact on reducing soil fertility and damaging the environment due to its unbreakable nature and potential to become harmful pollutants (Purwaningrum, 2016). By reducing pollution, eliminating waste, and minimizing the amount of hazardous chemical materials, water quality can be improved. Waste processing and recycling are very good positive activities to continue to be developed so that the environment becomes cleaner and healthier for every living creature that lives and resides in the environment.

The community service team also conducted interviews with several residents who participated in the ecobrick making activities and felt that the workshop provided not only theoretical insights but also valuable practical experience. This activity was held as one of the activities to follow up on the problem of plastic waste in the environment. In addition, in the session given, the public was also given education to reduce plastic waste by bringing their own shopping bags and not using single-use plastic. This is in line with the explanation that campaign and education activities need to continue to be carried out to every community and also students to reduce plastic waste, as well as other activities that can increase awareness that are beneficial for reducing plastic waste (Razza et al., 2020).

The active participation of all participants was clearly visible during the workshop sessions. This was seen when the community team was directly involved in various activities and discussions. The enthusiasm of the participants was reflected in their ability to collaborate effectively in groups, demonstrating a strong spirit of cooperation and mutual support. The cooperation that was established among the participants was one of the positive aspects of this workshop, helping to build a more solid social network among the residents of RW 10. This workshop succeeded in creating an interactive and fun learning atmosphere, while strengthening the community in achieving a common goal of reducing plastic waste and improving environmental quality. This is in line with the statement that face-to-face activities such as workshops can increase participant participation and interaction from each subject involved in it (Marco-Fondevila et al., 2022).

It is hoped that the women of RW 10 will become agents of change in their community, promoting sustainable practices, and contributing to the reduction of environmental pollution and the improvement of water quality. With new knowledge and skills, they can play a key role in maintaining environmental cleanliness and quality, especially related to the availability of clean water.

CONCLUSION

The ecobrick-making program in RW 10, Binong Subdistrict, Tangerang, demonstrated a significant impact in fostering environmental responsibility and active community engagement among local women. The program effectively mobilized participants to repurpose plastic waste into ecobrick, addressing both environmental pollution and community health concerns by preventing the accumulation of non-degradable waste in the area. Through hands-on workshops and continuous assistance, participants not only developed practical skills in recycling but also gained a deeper understanding of the environmental consequences of plastic waste. This initiative successfully promoted ecological awareness and fostered a collaborative spirit among residents, leading to the creation of a cleaner, safer community environment. Moreover, the positive reception and high levels of engagement among participants underscore the program's potential for long-term impact and scalability. By directly aligning Sustainable Development Goal 6, focused on clean water and sanitation, this initiative contributes to improved local water quality through reduced pollution and serves as a replicable model for other communities. Sustained and expanded efforts in similar recycling programs are encouraged to build upon this success, further embedding sustainable practices within the community and supporting regional environmental goals.

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REFERENCES

- Aryana, I. W. P. S., Astawa, I. W., Suwandana, I. M. A., Saidi, A. W., & Primadewi, S. P. N. (2023). PKM pendampingan desain kemasan pada RH (Reta Handycrafts) di Banjar Titih Tengah Kota Denpasar. *Journal on Education*, 5(3), 10626–10633. <https://doi.org/10.31004/joe.v5i3.1966>

- Badan Pengembangan dan Pembinaan Bahasa (Pusat Bahasa). (2024). *Proposal*. <https://kbbi.web.id/proposal>
- Bermuli, J. E., Ismanto, I., Lucky, E., & Manullang, M. L. (2023). Training on making handicrafts from natural materials and plastic waste for child activists and educators. *Journal of Community Service and Empowerment*, 4(3), 467–477. <https://doi.org/10.22219/jcse.v4i3.27449>
- Diana, A., Nizar, & Sari, R. (2023). Evaluasi program pendidikan. *Jurnal Studi Islam Indonesia (JSII)*, 1(1), 157–166.
- Ernawati, I., & Setiawaty, D. (2021). Efektifitas layanan bimbingan kelompok dengan teknik psikodrama dalam meningkatkan motivasi belajar siswa kelas VIID di SMP Negeri 11 Yogyakarta Tahun Ajaran 2017/2018. *G-Couns: Jurnal Bimbingan Dan Konseling*, 5(2), 220–225. <https://doi.org/10.31316/g.couns.v5i2.1567>
- Evode, N., Qamar, S. A., Bilal, M., Barceló, D., & Iqbal, H. M. N. (2021). Plastic waste and its management strategies for environmental sustainability. In *Case Studies in Chemical and Environmental Engineering* (Vol. 4). <https://doi.org/10.1016/j.cscee.2021.100142>
- Fatmawaty, D., Purnaweni, H., & Luqman, Y. (2020). Peran Serta masyarakat dalam menanggulangi kasus pencemaran dan/atau kerusakan lingkungan hidup. *Prosiding Seminar Nasional Lahan Suboptimal “Komoditas Sumber Pangan Untuk Meningkatkan Kualitas Kesehatan Di Era Pandemi Covid-19*, 978–979.
- Hasibuan, R. (2016). Analisis dampak limbah/sampah rumah tangga terhadap pencemaran lingkungan hidup. *Justice: Jurnal Ilmiah Advokasi*, 4(1), 42–52. <https://doi.org/https://doi.org/10.36987/jiad.v4i1.354>
- Indonesia, L. Sdg. (2025). *Sustainable development goals*. <https://localisedsgs-indonesia.org/17-sdgs>
- Kewengian, G. P. (2019). Partisipasi masyarakat dalam pengelolaan dan pelestarian lingkungan hidup. *Lex Et Societatis*, 7(5), 55–62.
- Khoiriyati, A., Huriah, T., Hidayati, L. N., & Indarwati, F. (2022). *Panduan penelitian UMY.pdf*. Universitas Muhammadiyah Yogyakarta.
- Lase, M. J., & Nababan, E. B. (2023). Penggunaan rubrik sebagai instrumen penilaian dalam kegiatan menulis teks editorial siswa sekolah menengah atas [The use of rubrics as an assessment instrument in high school students’ editorial text writing activities]. *Polyglot: Jurnal Ilmiah*, 19(2), 176. <https://doi.org/10.19166/pji.v19i2.6279>
- Maharani, S., & Aryanta, W. R. (2023). Dampak buruk polusi udara bagi kesehatan dan cara meminimalkan risikonya. *Jurnal Ecocentrism*, 3(2), 47–58. <https://doi.org/10.36733/jeco.v3i2.7035>
- Mahmudi, I. (2018). Rubrik analitik penilaian hasil belajar praktik Pendidikan Agama Islam. *Fikrah: Journal of Islamic Education*, 2(2), 32–154.
- Marco-Fondevila, M., Rueda-Tomás, M., & Latorre-Martínez, M. P. (2022). Active Participation and Interaction, Key Performance Factors of Face-to-Face Learning. *Education Sciences*, 12(7). <https://doi.org/10.3390/educsci12070429>
- Musarwan; Warsah, I. (2022). Evaluasi Pembelajaran (Konsep. Fungsi dan Tujuan). *Jurnal Kajian Pendidikan Islam*, 1(2), 186–199.
- Nugroho, S. H. S. (2022). ... *Komparasi Proses Pengambilan Keputusan Berwisata Antara Generasi X Dan Generasi Z (Studi Pada Wisatawan Yang Berkunjung* [Universitas Katolik Soegijapranata Semarang]. <http://repository.unika.ac.id/id/eprint/29470>
- Pasalina, P. E., Ihsan, H. F., Nurazlin, N., Tiamida, D., & Sasbia, A. Y. (2023). Upaya perlindungan dan pemenuhan hak kesehatan reproduksi penyandang disabilitas melalui edukasi kesehatan reproduksi di SLB Perwari Padang. *Jurnal Abdimas Kesehatan*, V(1), 179–185. <https://doi.org/10.36565/jak.v5i1.498>
- Purwaningrum, P. (2016). Upaya mengurangi timbunan sampah plastik. *Indonesian Journal of Urban and Environmental Technology*, VIII(2), 141–147. <https://doi.org/10.25105/urbanenvirotech.v8i2.1421>
- Putra, H. P., & Yuriandala, Y. (2010). Studi pemanfaatan sampah plastik menjadi produk dan jasa kreatif. *Jurnal Sains & Teknologi Lingkungan*, 2(1), 21–31. <https://doi.org/10.20885/jstl.vol2.iss1.art3>
- Rafi, P., & Perkasa, M. N. (2023). Dampak kerusakan terhadap lingkungan yang disebabkan oleh sampah plastik berdasarkan tinjauan UU No. 18 Tahun 2008. *JMI: Jurnal Multidisiplin Indonesia*, 2(7), 1420–1425. <https://doi.org/https://doi.org/10.58344/jmi.v2i7.299>
- Ramadani, A. H. (2019). Analisis vegetasi. In K. 'Aini (Ed.), *Panduan biology camp* (pp. 106–113). Yayasan Generasi Biologi Indonesia.
- Razza, F., Kujanpaa, M., Hamilton, Y., & Kabe, O. (2020). Single-use plastic bags and their alternatives. *Life Cycle Initiative*. <https://www.lifecycleinitiative.org/wp-content/uploads/2020/04/Single-use-plastic-bags-and-alternatives-Recommendations-from-LCA-final.pdf>
- Rusdiono, Zhan, F. F., Jalius, A. A., & Shadrina, D. N. (2023). Community-Based waste management: Pengelolaan sampah plastik kepada masyarakat Desa Punggur Kecil Kabupaten Kubu Raya. *DEDIKASI PKM: Jurnal Pengabdian Kepada Masyarakat*, 4(3), 505–514. <https://doi.org/10.32493/dedikasipkm.v4i3>
- Setyowati, V. A., & Widodo, E. W. R. (2017). Studi sifat fisis, kimia, dan morfologi pada kemasan makanan berbahan styrofoam dan LDPE (Low Density Polyethylene): Telaah Kepustakaan. *Jurnal Mechanical*, VIII(1), 39–45. <https://doi.org/10.23960/mech.v8.i1.201706>
- Sine, J. S., Lak'apu, M., Tandjung, F. L., Baun, N., Koroh, T. D., Oematan, T. O., Adu, M., & Sapai, M. (2023). Pelatihan dan pendampingan pembuatan bahan ajar bagi guru di Kabupaten Sumba Timur. *SAMBARA: Jurnal Pengabdian Kepada Masyarakat*, 1(2), 61–67. <https://doi.org/10.58540/sambarapkm.v1i2.189>
- St. Onge, J., & Eitel, K. (2017). Increasing active participation and engagement of students in circle formations. *Networks: An*

Online Journal for Teacher Research, 19(1). <https://doi.org/10.4148/2470-6353.1014>

- Suidarma, I. M., & Antini, N. L. A. S. (2023). Penerapan ecobrick sebagai solusi dalam mengurangi jumlah sampah plastik di Desa Pemogan. *JPPM (Jurnal Pengabdian Dan Pemberdayaan Masyarakat)*, VII(1), 157–163. <https://doi.org/10.30595/jppm.v7i1.9918>
- Tangkin, W. P. (2019). Pemanfaatan rubrik sebagai instrumen penilaian alternatif. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, 9(1), 29–39. <https://doi.org/10.24246/j.js.2019.v9.i1.p29-39>
- Widayat, W., Praharjo, A., Putri, V. P., Andharini, S. N., & Masudin, I. (2022). Responsible consumer behavior: Driving factors of pro-environmental behavior toward post-consumption plastic packaging. *Sustainability (Switzerland)*, 14(1). <https://doi.org/10.3390/su14010425>



Towards CLIL-based international classes: Preparatory endeavours through training of English-mediated instruction

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ARTICLE INFO	ABSTRACT
Article history Received: 2025-03-18 Revised: 2025-04-07 Accepted: 2025-04-11 Published: 2025-04-11 Keywords CLIL International Classes Training Mentoring English Mediated Instruction	<i>In today's global era, the internationalization of educational institutions is crucial. SD Muhammadiyah 4 Kota Malang acknowledged this necessity and is committed to providing high-quality education by adapting international standards. To fulfill this commitment as well as to support Sustainable Development Goal (SDG) No. 4, the school aims to create an international learning environment where teachers and students use English for instructions. Content and Language Integrated Learning (CLIL) is a suitable approach for internationalizing education at this school, as it integrates subject learning with language development. This community service aimed to train and mentor teachers in using English effectively for international class preparation. The program focused on three key objectives: (1) enhancing teachers' comprehension about CLIL, translanguaging, and trans-semiotizing concepts, (2) developing Classroom Passwords for all grade levels, and (3) implementing translanguaging and trans-semiotizing strategies. By understanding and applying CLIL, translanguaging, and trans-semiotizing, teachers can overcome anxiety about English use in the classroom. The teachers created verified Classroom Passwords which were registered for their intellectual property right and practiced translanguaging and trans-semiotizing in peer-teaching and real classroom settings as well as in virtual environment using Virtual Reality (VR).</i>
Kata Kunci Bahasa Inggris sebagai Bahasa Pengantar Pembelajaran CLIL Kelas Internasional Pelatihan Pendampingan	Menuju kelas internasional berbasis CLIL: Upaya persiapan melalui pelatihan instruksi yang dimediasi bahasa Inggris. Dalam era global saat ini, internasionalisasi lembaga pendidikan menjadi sangat penting. SD Muhammadiyah 4 Kota Malang menyadari kebutuhan ini dan berkomitmen untuk memberikan pendidikan berkualitas dan berstandar internasional. Untuk memenuhi komitmen tersebut serta mendukung Sustainable Development Goal (SDG) No. 4, sekolah bersiap menciptakan lingkungan belajar internasional di mana guru dan siswa menggunakan bahasa Inggris sebagai bahasa pengantar dalam pembelajaran. <i>Content and Language Integrated Learning (CLIL)</i> merupakan pendekatan yang sesuai untuk menginternasionalisasi pendidikan di sekolah ini karena mengintegrasikan pembelajaran mata pelajaran dengan pengembangan bahasa. Program pengabdian kepada masyarakat ini bertujuan untuk melatih dan mendampingi guru dalam menggunakan bahasa Inggris secara efektif untuk persiapan kelas internasional. Program ini berfokus pada tiga tujuan utama: (1) meningkatkan pemahaman guru tentang konsep CLIL, translanguaging, dan trans-semiotizing, (2) mengembangkan <i>Classroom Passwords</i> untuk semua tingkat kelas, dan (3) menerapkan strategi translanguaging dan trans-semiotizing. Dengan memahami dan menerapkan CLIL, translanguaging, dan trans-semiotizing, guru dapat mengatasi kecemasan dalam penggunaan bahasa Inggris di kelas. Sebagai hasilnya, para guru juga telah menciptakan <i>Classroom Passwords</i> yang telah diverifikasi dan didaftarkan untuk pencatatan hak kekayaan intelektual, serta mempraktikkan translanguaging dan trans-semiotizing dalam sesi <i>peer-teaching</i> dan pengajaran di kelas maupun secara virtual melalui <i>Virtual Reality (VR)</i>.

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INTRODUCTION

Content and Language Integrated Learning (CLIL) has been widely adopted in English-mediated classrooms around the world due to its numerous benefits for both students and teachers (Aguilar & Muñoz, 2014; de Oliveira et al., 2020; Lo, 2015; Rohmah, 2019). One of the key advantage is that students are not assigned to use English as the only language of instructions in CLIL classrooms. Instead, they can learn both English as a foreign language and content knowledge at the same time (Fernández-Fontecha et al., 2020). That is the reason why CLIL is suitable to be implemented in non-English speaking countries where internationally-tailored classrooms are established as part of educational internationalization efforts. In Indonesia, CLIL has been implemented in some Indonesian primary schools with various purposes. Some schools implemented it to enhance language learning (Setyaningrum & Khoiriyah, 2022; Setyaningrum & Purwati, 2020) while the others successfully integrated CLIL to teach both content and English through effective collaborations of English and subject teachers (Khoiriyah, 2021; Khoiriyah et al., 2022).

SD Muhammadiyah 4 Malang, one of the most renowned Muhammadiyah schools in Malang City, operates across two campuses: Jl. Sudimoro No. 19, Mojolangu, Lowokwaru, and Jl. Simpang Kyai H. Yusuf, Tasikmadu, Lowokwaru, Malang City. The school is actively preparing itself to meet international standards while maintaining its tagline: "Excellent, Religious, and Noble Character," which reflects its commitment to providing students with high-quality learning experiences. With a team of 38 staff members, including the principal, teachers—three of whom specialize in English—and educational personnel with relevant expertise, the school has earned multiple recognitions. It holds the titles of Healthy School, *Sekolah Penggerak* (Catalyst School), *Sekolah Adiwiyata* (Environmentally Conscious School), and is affiliated with Cambridge International. SD Muhammadiyah 4 Malang aspires to be the first Muhammadiyah elementary school in Malang to achieve an international designation by integrating the Islam, Muhammadiyah, Arabic (ISMUBA), Merdeka (Emancipated), and Cambridge curricula.

To establish itself as an internationally-tailored school, SD Muhammadiyah 4 Malang has taken significant steps across both campuses. Efforts include creating an international learning atmosphere by installing bilingual (English and Indonesian) signages, designating an English Zone in the library, enhancing English language instruction through engaging and holistic learning activities, and incorporating Cambridge University Press-published English textbooks into the curriculum. These initiatives aim to foster a global learning environment while maintaining the school's strong religious and character-building foundation. However, another crucial aspect that has not been conducted was training and monitoring teachers with English-mediated instructions skills ensure their skills align with the school's needs.

To provide the teachers with the opportunity to sharpen their knowledge and practices of teaching using English as a medium of instruction, the school proposed a collaboration with the lecturers of English Language Education Study Program. To address the proposal, three lecturers were assigned to set a preparatory program to train and monitor the teachers with English-mediated instruction learning. This community service program was held by all aforementioned staff members as participants and pre-service teachers (students of PMM Mitra Dosen program). Funded by the Faculty of Teacher Training and Education of Universitas Muhammadiyah Malang Blockgrant, this program was conducted from August to December 2024. Different from any other community service program for training and monitoring the teacher English language skills, this program is conducted by active participation of all participants. The teachers' efforts in upgrading their skills in teaching, specifically in internationally-tailored classes is in line with Sustainable Development Goal (SDG) 4 which advocates for inclusive and equitable quality education. As conveyed through personal communication with the school principal, this program is designed to support a qualified education in internationally-tailored classrooms by implementing CLIL, a dual-focused education. This objective is further substantiated by Ramadhan (2023), who emphasized the pivotal role of SDG 4 in advancing the internationalization of education in Indonesia.

METHOD

This community service was conducted to assist the teachers preparing them to get ready to teach subjects using English. The activities were grouped into three as explained by table 1.

Table 1. Activities and Outcomes of the Community Service

No	Activities	Outcomes
1.	Introduction to <i>Content and Language Integrated Learning (CLIL)</i> , <i>translanguaging</i> and <i>trans-semiotizing</i>	Teachers' understanding about CLIL, <i>translanguaging</i> and <i>trans-semiotizing</i>
2.	Training, Developing and Practicing to use <i>Classroom Passwords</i>	Opening and Closing Passwords for Grade 1-6 and Teachers' ability in using them.
3.	Training, Micro Teaching, and Practicing to use <i>Translanguaging</i> and <i>Trans-semiotizing</i> in teaching and in daily activities	Teacher's ability in using translanguaging and trans-semiotizing in teaching as well as in daily activities.

This program involved by homeroom teachers and educators from various subject areas including English, Mathematics, Science, Physical Education, Religion, and Islamic and Muhammadiyah studies. Its main objective was to enhance the participants' both English and pedagogical abilities in teaching in English-mediated classrooms. The following table explains their demographic information.

Table 2. Participants Demographic Information

No	Participants	Number of Participants	English Proficiency (CEFR)*
1	English Teachers	3	C1 - C2
2	Homeroom Teachers	6	B1 – C1
3	Science Teachers	3	B2 – C1
4	Mathematics Teachers	3	B2 – C1
5	Physical Education Teachers	1	C1
6	Religion Teacher	1	B1
7	Islamic and Muhammadiyah Studies	2	C1

* The Common European Framework of Reference for Languages (CEFR) is the standard for English proficiency which categorizes proficiency into six levels: A1 (Beginner), A2 (Elementary), B1 (Intermediate), B2 (Upper Intermediate), C1 (Advanced), and C2 (Proficient).

In total, 19 teachers took part in the training based on the timeline explained in figure 1, with English proficiency levels ranging from B1 to C2 according to the Common European Framework of Reference for Languages (CEFR).

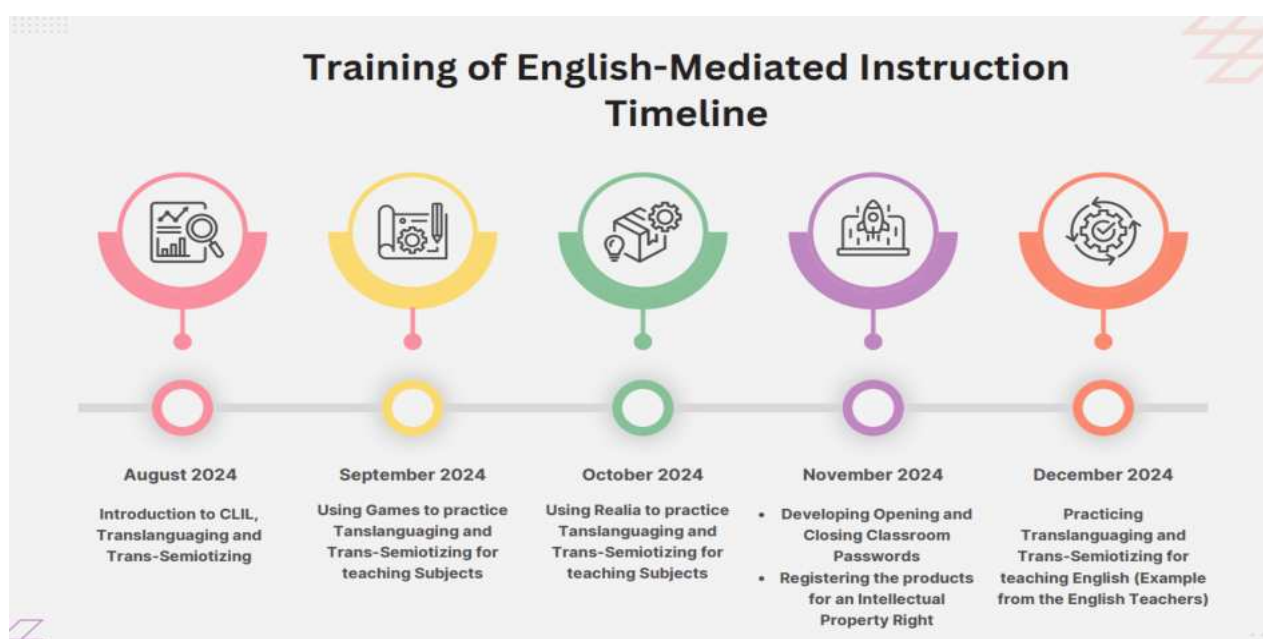


Figure 1. Training of English-Mediated Instruction Timeline

Figure 1 shows the timeline of English-Mediated Instruction that was structured across five months from August to December 2024. The program aimed to introduce the concepts of CLIL, translanguaging, and trans-semiotizing, alongside practical activities to support their classroom implementation. Throughout the training, teachers engaged with various tools such as games, realia, songs, and chants in English to enhance their application of translanguaging and trans-semiotizing in teaching.

RESULTS AND DISCUSSION

Introduction to Content and Language Integrated Learning (CLIL), Translanguaging and Trans-Semiotizing

CLIL is a learning approach that encompasses two concepts called -dual-focused learning where the foreign language - generally English - is the language of instruction (Dalton-Puffer, 2011; Fernández-Fontecha et al., 2020). As an approach commonly used in countries with a first language other than English, the first language (L1) plays a very important role in learning. (Lin, 2015) suggests that L1 should be used interchangeably with the foreign language as the target language (L2). During the training, teachers were introduced to the concept of CLIL to help them understand that using English in the classroom can be supported by the use of their first language (L1). This approach aimed to reduce their anxiety and

fear about explaining complex subject matter, particularly in mathematics and science. The introduction to the concept took place in one session, followed by a practical implementation session in the next meeting.

To introduce this concept, teachers were guided to use familiar English vocabulary when opening lessons, explaining content, and conducting evaluations. Once they gained confidence in using English, they were then trained to incorporate classroom language they had mastered, and to make notes on when and how they would use these expressions during their teaching. This concept introduces them to the practice of translanguaging and trans-semiotizing (Lin, 2019) in general as well as planned translanguaging and trans-semiotizing practiced by Liu (2020).

Translanguaging and trans-semiotizing were introduced by providing the teachers with practical examples, such as using a picture of the butterfly life cycle labelled in English (Setyaningrum et al., 2022). Teachers were encouraged to explain the process to students using simple English terms like *caterpillar*, *lays eggs*, *eats*, *one week*, *two weeks*, *leaves*, *butterfly*, *hangs upside down*, while also using Indonesian to clarify each stage of the cycle. Through this visual aid, the teachers learned how pictures can serve as valuable learning tools that support the integration of English to teach subjects.

By introducing this concept (Lin, 2019; Martí, 2020) the teachers could:

- a. improve the ability to use the target language
- b. improve the ability to communicate
- c. build awareness of the use of L1 and L2
- d. build interest and attitude in understanding language diversity
- e. introduce the target language

In the end, besides teaching new knowledge, teachers also teach students to better understand the use of the target language and improve their ability to communicate in the target language both orally and in writing (Fernández-Fontecha et al., 2020).

Using Games and Songs to Practice Translanguaging and Trans-semiotizing

Translanguaging and trans-semiotizing can be practiced in the classroom in elementary schools as has been implemented by Science and Mathematics teachers in three Muhammadiyah schools in East Java (Fauzan et al., 2023; Setyaningrum, 2023; Setyaningrum, et al., 2020). During the training, teachers learned to practice translanguaging and trans-semiotizing by playing games such as Find Your Friends Who. By repeating various forms of Yes/No questions, teachers began to learn the steps of how to play this Find Your Friends Who game. They were explained how the game can be used to teach a variety of subjects or themes. Here are the Steps to play the Find Your Friends Who game.



Figure 2. Game: Find Your Friends Who



Figure 3. The Teachers Practice to Play “Find Your Friends Who”

As shown in Figure 3, teachers practiced using the "Find Your Friend Who" game to engage students in Mathematics by identifying how many classmates had the same or a different number of objects. The game was also applied in Science lessons to help students gather information about various land animals they were familiar with. Besides using games, teachers also learned how to adapt English songs for educational purposes—for instance, modifying the lyrics of “The More We Are Together” to “The More We Run Together” to explain different movements.



Figure 4. Rehearsal “The More We Run Together”

Figure 4 illustrates how teachers learned to use the song “The More We Are Together” which was adapted by replacing the verb with “Run”, resulting a newly version song.

The More We Run Together

*The more we run together, together, together
The more we run together the healthier will be
For your friends are my friends and your friends are my friends
The more we run together the healthier will be*

Using Realia and Virtual Reality to Practice Translanguaging and Trans-semiotizing

Ralia is one of teaching media to use for clarifying particular information in English. One of the activities to introduce the use of realia for practicing translanguaging and trans-semiotizing was assigning the teacher to select learning materials to teach in English. Figure 5 shows a teacher who introduced a concept of Fractions in Mathematics using pizza toy before letting the other participating teachers use the real pizza for discussing Fractions concept in their groups by saying: “After learning about fractions using this media, now let’s learn it using the real pizza, *bisa ya?*”



Figure 5. A Sixth-grade Mathematics Teacher Used Realia to Teach Fractions

The participating teachers, organized in groups, followed the interaction attentively and participated in discussions guided by the demonstration. They identified parts of the pizza: “a half, one-third, a quarter, and three-fourths,” while discussing with their group members. This activity exemplified the use of realia as an effective strategy for supporting both conceptual understanding and English language use in Mathematics instruction.

The introduction of VR to teachers like in figure 6 was managed in order to provide knowledge that one way to reduce anxiety in using English because it is visible to the interlocutor. This is as a practice of trans-semiotizing in which internationally-tailored class activities can be conducted using environment provided by the VR. This has been proven in a study (Lestiono & Lee, 2024) which describes anxiety can be reduced by the use of VR in Public Speaking.



Figure 6. Practicing Trans-semiotizing using Virtual Reality

Creating and Using Classroom Passwords

Classroom Password is a song or chant used by students in each different class to get students excited to carry out learning activities in the classroom using English. Creating and using Classroom Password in English learning for children is suggested as an innovation in learning (Setyaningrum, Sabilah, et al., 2020).

The teachers were introduced to the Classroom Password that had been created by Teaching English to Young Learners (TEYL) students by using existing song melodies and creating song lyrics that described their respective classes. The lyrics created by the teachers were verified to be in line with the principles of songs for children that prioritize rhyme and easy language. The following is an example of a Classroom Password for teachers.



Figure 7. Example of Opening Classroom Password

Figure 7 exemplifies a Classroom Password with *Becak Becak* melody for Marvelous Class. The melody was chosen because of the Indonesian children familiarity with that Indonesian easy-listening song. Writing the song with the existing song's melody was found easier for the teachers. Resulting from the teachers' discussion during the training session, the following are the Classroom Passwords created by the teachers.

Classroom Passwords for Grade 1-6

The Classroom Passwords developed by the teachers, as illustrated in Figures 8–12, demonstrate their ability to adapt songs and chants to suit the specific characteristics of each class and the students' language proficiency levels. For lower-level students, simpler Classroom Passwords were designed, while more advanced versions were created for students at higher proficiency levels. These were suitable with each class characteristics as well as the students' language level. For earlier level students, simpler Classroom Passwords were created and more sophisticated ones were created to the upper-level students.

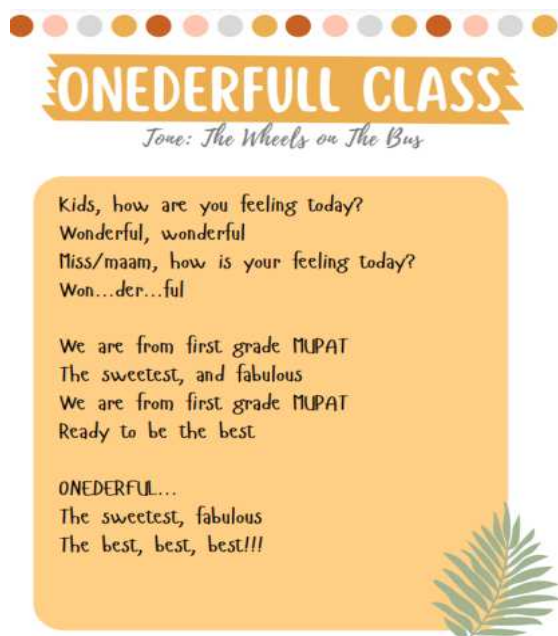


Figure 8. Classroom Password Grade 1

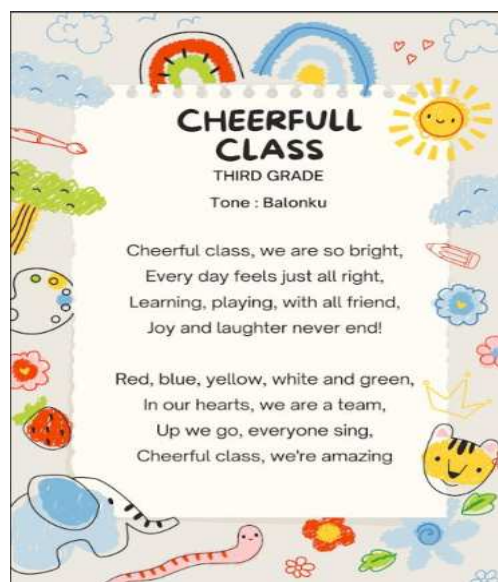


Figure 9. Classroom Password Grade 3



Figure 10. Classroom Password Grade 4



Figure 11. Classroom Password Grade 5



Figure 12. Classroom Password Grade 6



Figure 13. Using Classroom Password with Grade 5 Students

To see how Classroom Password is used in class 5, here is an accessible link:
<https://drive.google.com/file/d/1bokpJSG0ruaMYI9iuVLsVnJ9h9Cm4uWb/view?usp=sharing>

Practicing Translanguaging and Trans-semiotizing in Teaching

Understanding all the theories and practices of how to use English as a medium of instruction in teaching at internationally-tailored classrooms, three English teachers practiced how to teach as model for other teachers. The following figure is one of the examples.



Figure 14. Practicing Translanguaging and Trans-Semiotizing with Grade 3 Students

In Figure 14, the English teacher is teaching students Healthy Life as a topic of the day and discussing the types of diseases in the rainy season. Using English, the teacher mentioned the name of one of the illnesses, stomach ache, while holding her stomach with both hands and a look of pain on her face. Her acting can become semantic resources for students (Fauzan et al., 2023; Liu, 2020) in which the teacher did not need to translate the word she said in Indonesian because students immediately captured the information by responding “stomach ache” and the teacher added information about stomach ache in Indonesian language. The teacher implemented translanguaging and trans-semiotizing in this manner. At the same time, the students also engaged in translanguaging—for instance, when one student said “stomach ache,” others associated it with the Indonesian term “masuk angin.” A student who was unable to express the word in English could still communicate by using an Indonesian word related to the concept, rather than directly translating the English term.

Through engaging and meaningful learning activities, teachers have gained greater confidence in their ability to effectively support the implementation of international classes. The presence of well-prepared teaching staff who can skillfully integrate language into instruction is expected to significantly contribute to students’ success in acquiring both new subject knowledge and language skills.

CONCLUSION

This community service initiative highlights that translanguaging supports both teachers and students in using multiple languages flexibly to enhance comprehension, particularly in science and mathematics. Simultaneously, trans-semiotizing facilitates the use of diverse communication modes—such as images, diagrams, simulations, and gestures—to help clarify abstract concepts, especially within VR-based learning environments. Together, these approaches have a positive impact: teachers become more equipped to teach in multilingual classrooms using inclusive methods, while students benefit from greater access to content through varied media and languages, thereby strengthening their critical thinking and communication skills in an international context. However, successful implementation of translanguaging and trans-semiotizing requires intensive training and ongoing mentorship, as both approaches demand a solid understanding of underlying theories and practical application. Teachers must also be prepared to design instructional strategies that effectively integrate multiple languages and semiotic resources, including the use of virtual reality technology.

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REFERENCES

- Aguilar, M., & Muñoz, C. (2014). The effect of proficiency on CLIL benefits in Engineering students in Spain. *International Journal of Applied Linguistics (United Kingdom)*, 24(1), 1–18. <https://doi.org/10.1111/ijal.12006>
- Dalton-Puffer, C. (2011). Content-and-language integrated learning: From practice to principles? In *Annual Review of*

- Applied Linguistics*. <https://doi.org/10.1017/S0267190511000092>
- de Oliveira, L. C., Jones, L., & Smith, S. L. (2020). Interactional scaffolding in a first-grade classroom through the teaching–learning cycle. *International Journal of Bilingual Education and Bilingualism*, 0(0), 1–19. <https://doi.org/10.1080/13670050.2020.1798867>
- Fauzan, Setyaningrum, R. W., & Suparto. (2023). Pointed polysynchronous interactions in CLIL mathematics class during the COVID-19 pandemic: Translation, translanguaging, and trans-semiotizing. *Cogent Education*, 10(1). <https://doi.org/10.1080/2331186X.2023.2208776>
- Fernández-Fontecha, A., O'Halloran, K. L., Wignell, P., & Tan, S. (2020). Scaffolding CLIL in the science classroom via visual thinking: A systemic functional multimodal approach. *Linguistics and Education*, 55, 100788. <https://doi.org/10.1016/j.linged.2019.100788>
- Khoiriyah, K. (2021). Content and Language Integrated Learning (CLIL) in Indonesian context: An Overview. *Jurnal Pendidikan Progresif*, 11(November), 587–601. <https://doi.org/10.23960/jpp.v11.i3.202110>
- Khoiriyah, K., Farah, R. R., & Anggraeni, L. (2022). Integrating Islamic values in CLIL materials: a syllabus design for Islamic primary school. *Journal of English Language Studies*, 7(1), 12. <https://doi.org/10.30870/jels.v7i1.13297>
- Lestiono, R., & Lee, S. M. (2024). Virtual reality exposure therapy for reducing students' public speaking anxiety: A systematic review. *JALT CALL Journal*, 20(2), 1–24. <https://doi.org/10.29140/jaltcall.v20n2.1515>
- Lin, A. M. Y. (2015). Conceptualising the potential role of L1 in CLIL. *Language, Culture and Curriculum*, 28(1), 74–89. <https://doi.org/10.1080/07908318.2014.1000926>
- Lin, A. M. Y. (2019). Theories of trans/languaging and trans-semiotizing: implications for content-based education classrooms. *International Journal of Bilingual Education and Bilingualism*, 22(1), 5–16. <https://doi.org/10.1080/13670050.2018.1515175>
- Liu, Y. (2020). Translanguaging and trans-semiotizing as planned systematic scaffolding: examining feeling–meaning in CLIL classrooms. *English Teaching and Learning*, 44(2), 149–173. <https://doi.org/10.1007/s42321-020-00057-z>
- Lo, Y. Y. (2015). How much L1 is too much? Teachers' language use in response to students' abilities and classroom interaction in Content and Language Integrated Learning. *International Journal of Bilingual Education and Bilingualism*, 18(3), 270–288. <https://doi.org/10.1080/13670050.2014.988112>
- Martí, O. (2020). Content and language integrated learning: Which language? How is it integrated? What for? *Caplletra*, 68, 219–242. <https://doi.org/10.7203/CAPLLETRA.68.16478>
- Ramadhan, M. N. P. (2023). The Role of SDG 4: Quality Education on the Internationalization of Indonesia's Education. *Hasanuddin Journal of Strategic and International Studies (HJSIS)*, 1(2), 39–51. <https://doi.org/10.20956/hjsis.v1i2.27442>
- Rohmah, I. I. T. (2019). The Feasibility and Effectiveness of Integrating Content Knowledge and English Competences for Assessing English Proficiency in CLIL. *ETERNAL (English Teaching Journal)*, 10(1). <https://doi.org/10.26877/eternal.v10i1.3909>
- Setyaningrum, R. W. (2023). *Translanguaging in content and language integrated learning classrooms at Islamic primary schools of Indonesia*. Universitas Negeri Surabaya.
- Setyaningrum, R. W., & Khoiriyah. (2022). Core Features of Content and Language Integrated Learning (CLIL): An Exploratory Study in Indonesian Primary Schools. *Mextesol Journal*, 46(3), 0–1.
- Setyaningrum, R. W., & Purwati, O. (2020). Projecting the Implementation Feasibility of CLIL Approach for TEYL at Primary Schools in Indonesia. *JEES (Journal of English Educators Society)*, 5(1), 23–30. <https://doi.org/10.21070/jees.v5i1.352>
- Setyaningrum, R. W., Sabilah, F., & Sumarsono, P. (2020). Innovative Design for Pre-Service English for Young Learners (EYL) Teachers Education With Indonesian Setting. *Advances in Social Science, Education and Humanities Research*, 477, 621–625.
- Setyaningrum, R. W., Setiawan, S., & Anam, S. (2022). Translanguaging as a scaffolded practice in a primary school content and language integrated learning context during the COVID-19 pandemic. *European Journal of Educational Research*, 11(3), 2043–2055.
- Setyaningrum, R. W., Setiawan, S., Anam, S., & Retnaningdyah, P. (2020). Content and language integrated learning (CLIL) in science class during Covid-19 outbreak: A narrative inquiry. *English Review: Journal of English Education*, 9(1), 35–46.



Innovation and empowerment of CNC 2-axis laser use in Jogja Mastercraft in Yogyakarta, Indonesia

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ARTICLE INFO	ABSTRACT
Article history Received: 2023-10-03 Revised: 2025-03-02 Accepted: 2025-03-24 Published: 2025-04-12 Keywords Jogja Mastercraft Watches Glasses CNC e-commerce	Indonesia has the most significant percentage of wood producers worldwide, with 31.24% being furniture and handicraft products. Jogja Mastercraft's creative industry, owned by Mr. Iyos, was established in 2015 and has a turnover of 15 million monthly. This business had been impacted by the COVID-19 pandemic, which reduced labor and decreased the price of eyewear products and wooden watches. Wooden glasses and watches are handicrafts that have high value and are made from the primary material of wood waste. So that if sold and marketed, it has high potential in local and international markets. Some crucial problems are caused by Jogja Mastercraft partners using a manual process in making body bezels and cases on watches and frames on wooden glasses. This makes the product work up to 6 hours, and making glass frames takes 4 hours. In addition, the work on the bezel and case with a scroll saw machine also makes the final result less neat and precise. The second problem is that there are no effective marketing methods and strategies for increasing the sales figures of wooden watch products, so a Joomla-based e-commerce website is needed so that wooden watch sales can be optimal. The main methods and outputs carried out in the implementation of Community Empowerment (PBM) include the application of CNC (Computer Numerically Controlled) technology through the manufacture of laser-type CNC designs with two axes to increase productivity and quality of bezels and cases from wood clocks, provide training and guidance in managing effective marketing management and product promotion, and produce e-commerce websites.
Kata Kunci Pengrajin Jogja Jam tangan Kacamata CNC e-commerce	Inovasi dan pemberdayaan penggunaan laser CNC 2-axis di Jogja Mastercraft di Yogyakarta, Indonesia. Indonesia merupakan negara dengan persentase produsen kayu terbesar di dunia, dengan 31,24% merupakan produk furnitur dan kerajinan tangan. Industri kreatif Jogja Mastercraft Pak Iyos berdiri sejak tahun 2015 dan memiliki omset 15 juta per bulan. Usaha ini terdampak oleh pandemi COVID-19 yang berdampak pada pengurangan tenaga kerja dan penurunan harga kacamata dan jam tangan kayu. Kacamata dan jam tangan kayu merupakan kerajinan tangan yang mempunyai nilai tinggi dan berbahan dasar limbah kayu. Sehingga jika dijual dan dipasarkan mempunyai potensi yang tinggi di pasar lokal maupun internasional. Beberapa permasalahan krusial ditimbulkan oleh rekanan Jogja Mastercraft yang menggunakan proses manual dalam pembuatan bezel body dan case pada jam tangan serta frame pada kaca mata kayu. Hal ini memungkinkan produk bekerja hingga 6 jam, dan bingkai kaca membutuhkan waktu pembuatan 4 jam. Selain itu, pengerjaan bezel dan case dengan mesin scroll saw juga membuat hasil akhirnya kurang rapi dan presisi. Permasalahan kedua adalah belum adanya metode dan strategi pemasaran yang efektif untuk meningkatkan penjualan produk jam tangan kayu, sehingga diperlukan website e-commerce berbasis Joomla agar penjualan jam tangan kayu dapat optimal. Metode dan luaran utama yang dilakukan dalam pelaksanaan Pemberdayaan Masyarakat (PBM) antara lain penerapan teknologi CNC (Computer Numerically Controlled) melalui pembuatan desain CNC tipe laser dengan dua sumbu untuk meningkatkan produktivitas dan kualitas bezel dan case. Mulai dari jam kayu, memberikan pelatihan dan bimbingan dalam mengelola manajemen pemasaran dan promosi produk yang efektif, serta pembuatan website e-commerce. Copyright © 2025, Setiawan, et al. This is an open access article under the CC-BY-SA license 

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INTRODUCTION

Commodities, arts and crafts, and imported production goods based on local wisdom are only around 35% of the potential of small and medium enterprises in the Yogyakarta D.I. Province (BPS, 2021). As shown in Figure 1, the area of Kulon Progo Regency has a large area of forest potential, covering 34% of the total. The forest produces various types of potential wood, including *teak*, *sungkai*, *mahogany*, *trembesi*, *mindy*, *pine*, *meranti*, and *sandalwood*. This area is 45 km west of Yogyakarta, bordering Sleman, Bantul, and Purworejo Regency, Central Java. The advantages of this region include fisheries, agriculture, animal husbandry, food production, and handicrafts. This potential makes the supply of the main material in Kulon Progo very likely to increase the foreign exchange export of Indonesian handmade goods. The lowest livelihood is the field of handicrafts, which is only 4% of the total in Yogyakarta Province (BPS, 2021).



Fig 1. Potential in Kulon Progo Regency

The center of the wood handicraft industry in Kulon Progo is declining yearly. Moreover, the COVID-19 pandemic has caused many MSMEs to close or leave business. Several industrial centers have stopped their business. The number of small and medium businesses in Kulon Progo is 20,150 to 18,140 industrial business units (BPS, 2021). The business unit that went down was furniture, but the business unit merged. Wood, easily available materials have more potential in producing wood production crafts.

Moreover, wood waste from the production of furniture and furniture reaches 40%. So far, industrial waste wood waste is only wasted and can only be used as firewood. Wood waste that is often wasted includes *teak*, *mahogany*, *sonokeling*, and *jackfruit* wood. These wood wastes can also be processed into various unique crafts and have high economic value. Wooden watches are part of fashion commodities created from the need for environmentally friendly and sustainable raw materials (Mulyono, 2022). The utilization of wood waste aligns with Sustainable Development Goal (SDG) 8: Decent Work and Economic Growth, by promoting creativity, creating new job opportunities, and increasing community income through the development of creative industries based on local resources.

In buying wooden glasses and watches, seven criteria are considered: durability, design, ease of getting spare parts, fashion, environmentally friendly materials, price, and locally made (Nareswari, 2018). The design criteria have four sub-criteria: clock shape, wood type, personalization, and strap type. As for glasses with criteria: shape and mode, color, hinge type, and logo. There are 24 alternative combinations of wooden watch designs from the alternative combinations of sub-criteria. The design alternative with the highest weight for potential buyers is a round clock shape with sonokeling wood, as this product offers a good design and comfort when worn. As for glasses, consumer selection criteria are only based on the suitability of face shape and color taste, all of which come back to each customer's preferences. (Maharani, 2018).



Fig 2. Products from partners

The wooden waste crafts industry, particularly the wooden watch industry in Madigondo Hamlet, Samigaluh District, Kulon Progo Regency, Special Region of Yogyakarta, is highly sought after by tourists and foreign citizens. The main appeal of these products lies in their excellent and aesthetic design, combining the uniqueness of natural wood grain with a touch of modern creativity as shown in Figure 2. Unfortunately, Mr. Iyos does not have market access to his products abroad. Marketing only capitalizes on product exhibitions held by the Department of Industry and MSMEs. In the development of wooden watch production, partners have major problems, namely the ineffective process of making bezel bodies and cases on watches and making frames on wooden glasses that require a long time. Another challenge is that the products lack precision and neatness, due to the manual workmanship, as shown in Figure 3. Making CNC cutting drill machines and CNC with laser technology is expected to shorten production and improve the quality of glasses and wooden watch products. CNC cutting machines and lasers are one of the core components in a precision manufacturing process that must be considered in producing glasses and watches. The CNC machining process begins with designing objects using Computer-Aided Design (CAD)-based software, then forwarded to the manufacturing process using Computer Aided Manufacturing (CAM software, which is an application technology that uses computer software and machines to facilitate and automate the manufacturing process (Prianto, 2017). Likewise, during the manufacturing process, it must also meet stringent quality standards for the material and its assembly (Abeni et al., 2020). The field of watch production requires new tools to improve the efficiency of watch production (Zurbuchen et al., 2017).



Fig 3. Semi manual scroll sew process

The logo design developed by Jogja Mastercraft so far is only in the form of manual sketches made with pencils. Therefore, laser-based CNC is needed to speed up the process of engraving and printing logos on clocks and glasses. Using computer-based design software, FreeCAD will improve the quality of creative and innovative designs. Based on interviews on February 6, 2023, sales turnover during the COVID-19 pandemic is declining. From 2021, the total sold was 612 pcs. In 2022, it dropped to 432 pcs with an average per month of 40 pcs. This has an impact on the income of employees and business owners. Creating an e-commerce website for sales is expected to increase sales and increase the price of wooden watch products significantly.

Jogja Mastercraft MSMEs in Sidoharjo Village have the potential to boost the community's. Some crucial problems caused by partners, including the absence of technology that speeds up the production process of eyeglass frames and body and case bezels, wooden watches; the absence of knowledge on how to use CNC cutting machines and CNC lasers and partners do not know about creative product marketing management so a Joomla-based e-commerce website is needed. So that sales of glasses and wooden clocks can be optimal. This PBM activity is carried out to empower partners in production and sales following IKU (Key Performance Indicators), namely the involvement of partners in partnership activities, especially in improving community welfare. In addition, this activity involves four of mechanical engineering and electrical engineering students of Universitas Negeri Yogyakarta (UNY) who will assist in the tool design process and product marketing improvement activities. From several situation analyses, partner problems can be identified, namely: (1) Production results are still relatively low, estimated at 25 to 50 pcs per month; (2) Partners do not yet have technology in the form of CNC (Computer Numerically Controlled) cutting and laser tools that can cut the production process and improve the quality of glasses and wooden clock products to be optimal; (3) the Partner has no knowledge of computer-based clock design technology with FreeCAD; (4) Partner has no knowledge of marketing goods through online media so that they can be exported abroad; (5) Sales value decreased by 40 pcs/month due to the COVID pandemic which made the price of glasses and wooden watches also decrease.

The main problem in goods production is the lack of equipment partners own, causing low production figures. The production process is slow with a semi-manual Scroll sewing machine, so a solution is needed to optimize production quantities. The absence of CNC machine technology can facilitate and speed up the production process of making glasses and wooden watches. By involving two lecturers with electrical engineering expertise and one lecturer with mechanical engineering expertise, they can find solutions to this problem. In addition, the involvement of mechanical engineering and electrical engineering students will enable them to improve soft skills and experience and can convert student involvement in community service equivalent to five credits. Lack of knowledge about how to design glasses and wooden

watches with computers causes the design results not to be maximized. Also included is the logo design, which was initially the logo was only carved manually with a wood carving blade.

The second problem is the field of marketing management. Partners in marketing their products internationally possess no knowledge. This impacts sales figures only limited to local level sales and some National levels. There is no knowledge about the management of the goods export business, so the goods marketed only reach the national scale. This is done in an effort to succeed in the upstream and downstream business programs. This is in line with IKU from UNY, one of which is students who get off-campus experience and increase cooperation partners in the Tridharma of Higher Education. Meanwhile, in IKU, lecturers doing off-campus activities will also increase the achievement performance of UNY, which has been ranked in the top five nationally.

The focus on Community-Based Empowerment includes Increased Production of Glasses and Wooden Watches. The production of goods in the form of glasses, which initially amounted to 50 pcs, will be increased with a target of 100 pcs. For the production of wooden watches, the target increase is from 25 pcs to 50 pcs per month. It improves the quality of the bezel body and case for wooden watches by designing a drill bit-based CNC machine tool. Improving the quality of eyewear and wooden watch products is expected to increase the purchase of Jogja Mastercraft products. It is improving the quality of logo and motif making by designing laser-based CNC engraving machines. A CNC laser engraving machine will facilitate partners in making images, logos, and brand writing. Increase sales figures by expanding the production process abroad. This step was taken because of trade competition with other products, especially from China and Europe. Increasing sales is also done by assisting and training in creating international e-commerce accounts such as Tokopedia, Shopee, and Lazada. The three e-commerce have been used by countries in Asia so that marketing will be more affordable. Accompany and provide K3 (Occupational Safety and Health) training workshops to provide workplace safety guarantees.

METHOD

The activities to be carried out will be explained in detail based on partner problem-solving methods. Preparation is focused on preparing all the equipment needed to carry out the activity. In addition, supporting activities include literature studies coordination with related partners, agencies, sub-districts, village heads, and community leaders who assist PMB program activities. Training and assistance for CNC trials are located at the wooden watch production site by the contextual direct method, where partners see, pay attention, and practice directly. The following is the solution analysis procedure at PMB Jogja Mastercraft in Samigaluh.

As a top cluster university, UNY has a vision to conduct world-class research by applying research results through community service. The Community Partnership Program provides facilities to lecturers to improve community welfare, especially at Jogja Mastercraft MSMEs in Sidoharjo Village. In the ranking of community service, after competing with more than three thousand universities throughout Indonesia, UNY managed to rank fifth in the Superior Cluster. This is stated in the Decree of the Director General of Research and Development Strengthening, Number 44 / E / KPT / 2017, dated August 10, 2017, concerning Higher Education Ranking based on Community Service Performance (PPM) for 2013 – 2015. This achievement cannot be separated from UNY's efforts and hard work in improving performance in community service. Meanwhile, in 2019, UNY ranked eighth in community service performance in the superior cluster.

In strengthening community service performance, UNY collaborates with more than 70 local government agencies and more than 200 domestic government agencies. Meanwhile, for the performance and track record of the chief proposer, Dr. Risky Setiawan also received a PKM (Community Partnership Program) grant from DRPM (Directorate of Research and Community Service) Kemdikbudristek, among others, with the title PKM Home Industry Jenang in Kudus Regency (Setiawan, 2017). The PKM is to design and make electric power mixer machines so as to increase the productivity of the manual porridge home industry. Meanwhile, PKM was also successfully obtained in 2021 from the DRPM of the Ministry of Education and Culture and Technology, also carried out by Dr. Risky Setiawan with the title PKM Vaname Shrimp Farming Group in Mirit Village, Mirit District, Kebumen Regency. A technological breakthrough in making a Micro Bubble Generator (GMB) machine to increase *vaname shrimp* yields in Mirit Village, Kebumen Regency. Meanwhile, it is supported by the Sunflower Community Development PKM results in Glagah Village, Kulon Progo, DIY (2023), which develops an absorption irrigation system with a planting system in making an irrigation system in the sunflower garden. The relevance of the research was conducted by Dr. Risky Setiawan, who developed the Virtual Reality Learning Media industry prototype (2021) and the development of the Virtual Storyboard Reality History of Java industry prototype in 2021. At the same time, the relevant research that has been conducted by Alfian Ma'arif, Ma'arifis the Application of Intelligent Search Algorithms in Proportional-Integral-Derivative Control of Direct-Current Motor System (2019) and developed a maze robot design entitled New Design of Line Maze Solving Robot with Speed Controller and Short Path Finder Algorithm in 2019 and the results of research on design Control of DC motor using integral state feedback and comparison with PID: simulation and Arduino implementation (2021). Meanwhile, the results of research conducted by Setiawan (2019; 2021) entitled quadrotor orientation control system with linearization on moving operating point and application of lqr full-state feedback controller for rotational inverted pendulum, which all support

the CNC cut and laser assembly process. The experience and track record of the chairman and members are very relevant to the proposed PKM program.

This activity was proposed by the implementation team leader from the UNY Education Evaluation Study Program, one vocational lecturer in electrical mechatronics engineering at UAD (*Universitas Ahmad Dahlan*), one vocational lecturer in electrical engineering at UNY, and one vocational lecturer in mechanical engineering at UNY. This implementation team comprises three lecturers, one technician, and 20 students. These lecturers have areas of expertise: educational evaluation, measurement, and assessment to compile training programs and evaluations, one person in mechanical engineering education to design CNC machines, and one in electrical education to design CNC machine electricity and build e-commerce.

They are making CNC (Computer Numerically Controlled) equipment at the Jogja Mastercraft production site. Machine making is carried out in the welding workshop laboratory at the Faculty of Engineering, Yogyakarta State University, which members of service in mechanical engineering and electrical engineering guide. Design of this CNC is shown in Figure 4. Machine Manufacturing and installing CNC equipment are carried out with the following steps—preparation of CNC machine manufacturing by conducting electrical installation surveys and tool placement according to K3. CNC machine placement is carried out with protection from heat and rain. They are designing electrical installations to be following Occupational Health, Security, and Safety. Wood clock engraving machines use mechanical, electrical, and computer software systems. It has three axes: X, Y, and Z. Or it can move left-right, forward-backward, and up-down. 800 x 700 x 400 mm movement set with keyboards. The wood clock carving machine adopts CNC milling, using a shaft track to regulate the wood carving tool movement. The rails use slides-drawer rails, 30 mm in diameter and 600 mm in length Hiwin Linear Guideways W20C/W15C. The machine frame of St 20 low carbon iron and the engraving foundation uses aluminum 6061 1.5 mm thick coated with multiplex with a thickness of 4 mm Spindle 300 Watt brand SETCO 120 mm as a holder of carved chisel.

The advantage is that the chisel is easy to remove and install quickly. Motor spindle speed control inverter using VFD Inverter 2.7 kilowatt 220V. Omron Automation S8VS-06024 AC-DC; 24V-2.5A as Power supply wood carving machine. M542/M752 Motor Stepper Driver for the drive control interface. The wood carving machine's X and Y axis drive uses a stepper motor SANYO DENKI 12 Series 1 phase and Input voltage 220 V / 50 Hz / 5 A/fuse 10 A. The drive system uses a C7 ball screw length of 600 mm THK brand Accuracy 0.05 mm. Ball bearing type bearing 6206ZZ. The operation uses a minimum Pentium desktop computer with a DSP (digital signal processing) system. Control the wood carving machine controller from the keyboard and monitor directly in contact with the operator. An encoder converts the signal into a code using the Incremental encoder type E50S-C Series. The connection uses a parallel or universal serial bus (USB). The programming language uses Mach 3 software, translated to mechanical movements and assisted by FreeCAD and CAM software. The program results can be stored on a flash disk and reused to rerun the wood carving process.

The steps taken to pilot CNC machines are as follows: (1) Planning and drawing workpieces in FreeCAD software; processing images into numeric codes using CAM software; testing the numeric code in the simulation software; if the code is not problematic, proceed to enter the workpiece parameters on the CNC machine, enter the tested numeric codes into the CNC machine and run the CNC machine to process thus producing the workpiece as designed; (2) Making workpiece designs using FreeCAD software, then proceed to convert the design into numeric codes (NC codes). Furthermore, the resulting numeric code is tested for correctness in a CNC simulation software; (3) The design process and changing the design into numeric codes is carried out with CAD / CAM software, one of which is MasterCam. Mastercam is computer software based on CAD / CAM (Computer Aided Design/Computer Aided Manufacturing). This application is used to design and create CNC programs for machining processes.

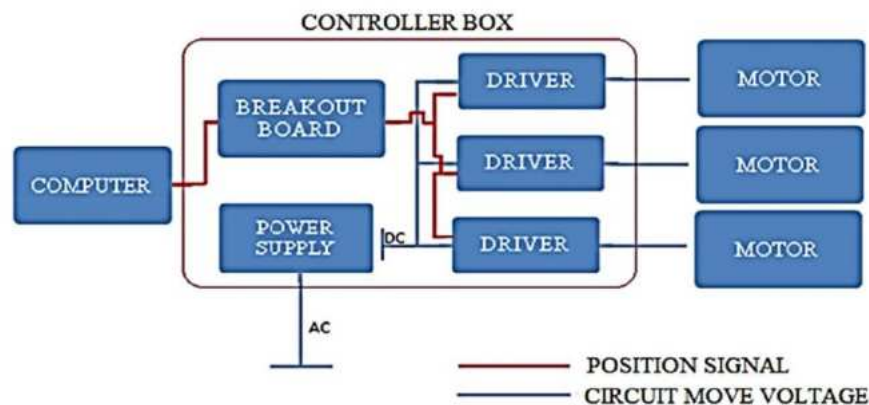


Fig 4. Design of 2-axis CNC Machine

This training is carried out to provide knowledge about marketing management of goods and services, especially the production of wooden clocks to be marketed. The training steps are as follows: (1) Prepare a training site, namely at

Sidoharjo Village Hall, Samigaluh District, Kulon Progo; (2) Prepare materials for training and resource persons for marketing management experts; (3) Provide training on how to promote goods and services; (4) Provide training in financial management and management of shipping goods abroad; (5) Provide facilities related to information systems in the form of PC devices and internet access to improve promotion via the internet; (6) Create digital pamphlets to post on social media (Tweeter, Instagram, YouTube, Facebook)

The last step is creating a website using Joomla software to form an interactive website about marketing and selling wooden watches online. The steps for creating an e-Commerce website using Joomla CMS are used to promote wooden watch products as follows: (1) Collecting documentation photos for profiles of goods produced by Jogja Mastercraft and exciting words for marketing fuel saving tools uploaded on e-Commerce websites (Payne, 2013); (2) Prepare a set of computers or laptops accompanied by the installation of data networks used for internet access; (3) Request from partner representatives to prepare training on e-Commerce website creation; (4) Because open source can be downloaded on the official website, namely <http://www.joomla.org>; (5) Install Joomla CMS by double-clicking setup; (6) The process of installing an image display by inserting an image for the purpose of introducing Jogja Mastercraft profile accompanied by a caption; (7) Upload the pictures to be promoted, namely the list of wooden watch products, prices, shipping costs, and discounts; (8) Use Virtuemart CMS Joomla for purchase transactions with the payment process for ticket purchases made by wire transfer; (9) Polish the appearance of the website as beautiful as possible with complete information so that website visitors are interested and curious about partner products.

The evaluation is carried out by monitoring and assessing the results of service activities: a) assessing the readiness of Jogja Mastercraft owner partners, b) new knowledge about techniques for using CNC tools, and c) having techniques in making bezels and cases. Next is the final evaluation, which analyzes the progress from the increase in the number of e-commerce website visitors and the increase in revenue within three months after all PBM activities are carried out. The entire team carried out the evaluation, assisted by four students who also helped in the whole series of activities as a form of off-campus activities (BMKM). Data analysis to evaluate the program by calculating the percentage between before and after activities. By looking at the difference in scores, it will be possible to conclude the effectiveness of the program. Analysis of data presentation using bar charts to see increases in production and sales.

RESULTS AND DISCUSSION

The activities to be carried out will be explained in detail based on partner problem-solving methods. The implementation method in this program consists of several steps, namely:

Preparatory Stage

Preparation is carried out by planning the time of implementation of activities. Planning is done by purchasing tools and materials to design a two-axis CNC machine laser for carving and cutting wooden clock bezels. The tools and materials needed to assemble a two-axis CNC machine are purchased at the Jogja Electronics Center and Wates Iron and Welding Shop. The next stage of preparation is scheduling, where the results of scheduling activities are designed as follows.

Table 2. Planning and Implementation of Activities

No.	Activities	Planning	Implementation
1	Preparation, observation of partners, work programs/schedules, coordination with partners	Jun 7, 2023	June 20 – 24, 2023
2	Purchase of tools and materials for assembling 2 Axis CNC machines laser	July 20 – 24, 2023	July 22 - 24, 2023
3	Tool test preparation	July 27, 2023	July 26, 2023
4	CNC machine operational workshop training and tool handover	August 25, 2023	September 6, 2023

Training and assistance for CNC trials are located at the wooden watch production site by the contextual direct method, where partners see, pay attention, and practice directly, as shown in Figure 5. Machine making is carried out in the welding workshop laboratory at the Faculty of Engineering, Yogyakarta State University, which members of service in mechanical engineering and electrical engineering guide. Manufacturing and installing CNC equipment are carried out with the following steps—preparation of CNC machine manufacturing by conducting electrical installation surveys and tool placement according to K3. CNC machine placement is carried out with protection from heat and rain. They are designing electrical installations following Occupational Health, Security, and Safety. Wood clock engraving machines use mechanical, electrical, and computer software systems.



Fig 5. 2-axis CNC Machine Assembly Process

Operation using a minimum Pentium desktop computer equipped with a DSP system (Digital Singal Processing). Control the wood carving machine controller from the keyboard and monitor directly in contact with the operator—encoder as converting a signal into a code using type Incremental encoder E50S-C Series. The connection uses a parallel or universal serial bus (USB). The programming language uses Mach 3 software, translated to mechanical movements and assisted by FreeCAD and CAM software. The results of the program can be stored on a flash drive and reused to rerun the wood carving process.

CNC Machine Test Run

The steps taken to pilot CNC machines are as follows: (1) Planning and drawing workpieces in FreeCAD software; processing images into numeric codes using CAM software; testing the numeric code in simulation software; if the code is not problematic, proceed to enter the workpiece parameters on the CNC machine, enter the tested numeric codes into the CNC machine and run the CNC machine to process to produce the workpiece as designed. The steps are shown in Figure 6 & 7.



Fig 6. CNC Test Process and Test Results

Make workpiece designs using FreeCAD software, then convert the design into numeric codes (NC codes). Furthermore, the resulting numeric code is tested for correctness in a CNC simulation software; (3) The design process and changing the design into numeric codes is carried out with CAD / CAM software, one of which is MasterCam. Mastercam is computer software based on CAD / CAM (Computer Aided Design / Computer Aided Manufacturing). This application is used to design and create CNC programs for machining processes.

Mastercam software has four icons, namely, Mastercam used for drawing (design), lathe process (Lathe), milling process (Mill), and wire cutting process. CAD/CAM-based computer software with computer graphics facilities allows users to perform various machining process simulations before being implemented in the actual machining process.

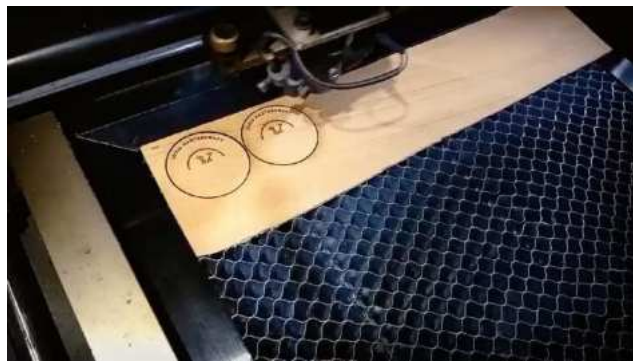


Fig 7. Results of wire cutting on cnc on wooden watch material

Training and Mentoring on The Management of Promotion Of Goods Or Services

This training is carried out to provide knowledge about marketing management of goods and services, especially the production of wooden clocks to be marketed. The training steps are: (1) Prepare a training site, namely at Sidoharjo Village Hall, Samigaluh District, Kulon Progo; (2) Prepare materials for training and resource persons for marketing management experts. Five participants and one owner attended this training. The training material is K3 on using CNC machines, followed by training on CNC machines. The next training is making drawing designs with FreeCAD, carried out by participants and guided by a service team. The last step is to test the CNC machine on wood so that it will provide an overview of the effectiveness of the tool.

Handover of CNC Tools

Handover of tools (products) in the form of a 3-axis CNC machine one unit, four locking tools, a set of locks and screwdrivers, two sets of drill bits totaling ten eyes each, and one bottle of lubricating tools for CNC machines. Here are training and mentoring activities to test and provide tutorials for operating CNC machines. This handover is symbolically marked by the handing over of a certificate, as seen in Figure 8.



Fig 8. Handover of 2-axis CNC tools.

E-commerce Website Development and Training

The website creation will use Joomla software to create an interactive website about marketing and selling wooden watches online. The steps for creating an e-commerce website using Joomla CMS are used to promote wooden watch products as follows. The process of installing an image display by inserting an image for the purpose of introducing the Jogja Mastercraft profile accompanied by a caption. Upload the images to be promoted, namely the list of wooden watch products, prices, shipping costs, and discounts. Use Virtuemart CMS Joomla for purchase transactions with the payment process for ticket purchases made via transfer to an account. Polish the website's appearance as beautifully as possible with complete information so visitors are interested in partner products. Here's what the finished Joomla CMS e-commerce website looks like, shown in Figure 9.

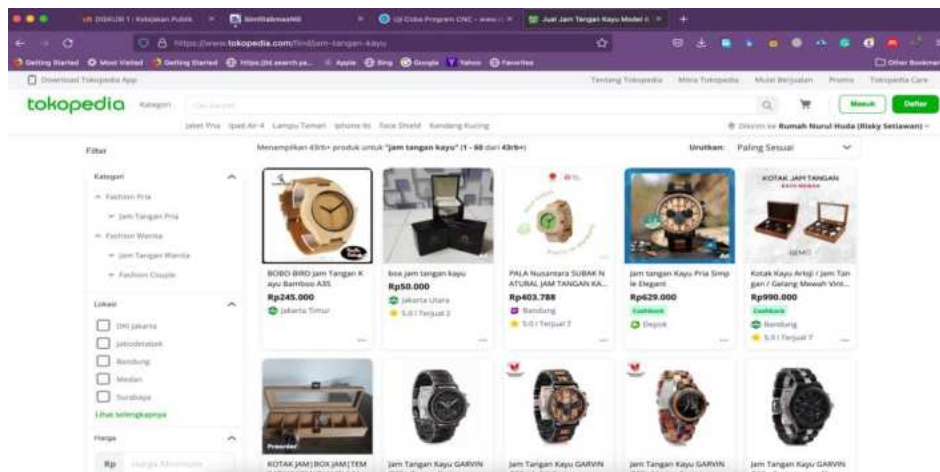


Fig 9. Joomla CMS e-commerce website display

Evaluation of Program Implementation and Sustainability

The evaluation is carried out by monitoring and assessing the results of service activities: a) assessing the readiness of Jogja Mastercraft owner partners, b) new knowledge about techniques for using CNC tools, and c) having techniques in making bezels and cases. Next is the final evaluation, which analyzes the progress from the increase in the number of e-commerce website visitors and the increase in revenue within three months after all PKM activities are carried out. The evaluation was carried out by the entire team, assisted by four students who also helped in the whole series of activities as a form of off-campus activities (BMKM). The following are the results of the evaluation of PKM activities that have been carried out.

Table 3. Results of PKM Implementation Evaluation

No.	Indicators	Before	After
1	Quantity of production	54pcs/month	120pcs/month
2	Application of Technology	Using a scroll saw	Using CNC 2-axis laser
3	FreeCAD Design Knowledge	Haven't haven't yet	Already mastered
4	Marketing	Don't havDon'tommerce yet	Create an e-commerce
5	Sales Quantity	60pcs/month	104pcs/month

The results of the evaluation conducted for approximately two months showed a significant increase, namely in terms of quantity and terms of sales. This can be seen from the increase in quantity from 54 pcs to 120 pcs per month. As shown in Figure 10.

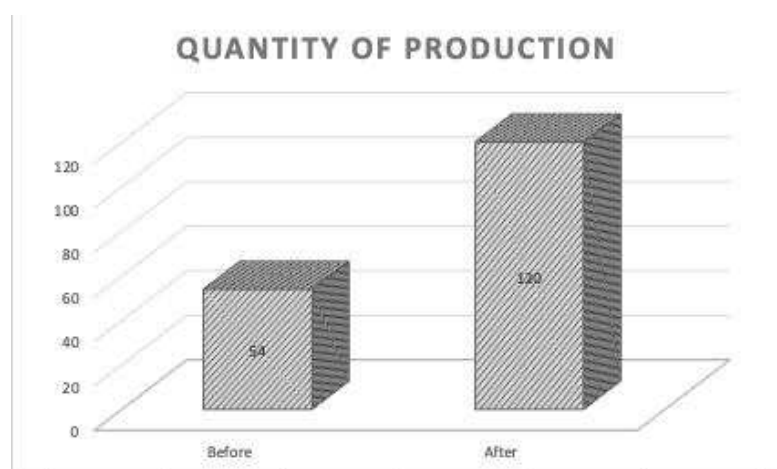


Fig 10. Results of increased production quantity

Judging from the results, sales also increased by 64, namely from before the program of 40 to 104 pieces per month. So that the profit achieved reaches twice as much. Here is the result of the increase in sales amount from PKM described in Figure 11.

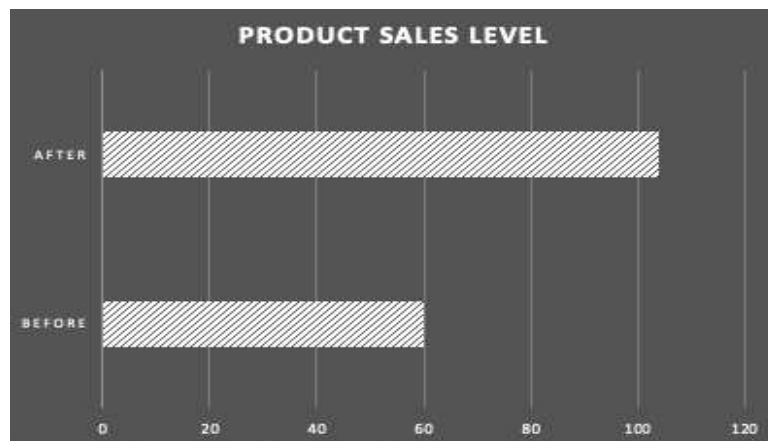


Fig 11. Wooden watch sales quantity

CONCLUSION

The conclusions of the community partnership program activities that have been carried out are as follows. Products have been produced in the form of 2-axis CNC laser machines with computer technology and design with the FreeCAD program to improve Wooden Watch products. 2 axis CNC products have been function tested with good results, characterized by the functioning of the tool as planned. The results of the evaluation conducted for approximately two months showed a significant increase, namely in terms of quantity and terms of sales. This can be seen from the increase in quantity from 54 pcs to 120 pcs per month. The number of sales also increased by 64, from before the program of 40 to 104 pieces per month. So that the profit achieved reaches twice as much. Assistance and training have been provided to provide knowledge about wooden clock bezel design with programs and the creation of e-commerce websites as promotional media for wooden watch sales. Partners are advised to maintain and maintain two-axis CNC laser machine products that have been given to partners following the advice for use and consistently promoting products in the form of wooden clocks by regularly updating them so that sales continue to increase. However, some limitations faced include the 2-axis CNC machine's restriction to certain products, and the challenge of understanding the FreeCAD program for partners who are not yet experienced. Additionally, sales are still limited to specific markets, which hinders broader expansion. Therefore, the development plan moving forward can focus on increasing production capacity by adding more CNC machines or advanced technology, along with further training for partners in using design software and CNC programming techniques. Furthermore, expanding the market through a more e-commerce platform and innovating products to attract a broader consumer base can increase the achieved results.

ACKNOWLEDGMENT

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REFERENCES

- BPS kabupaten Kulon Progo Provinsi D.I.Yogyakarta, 2021, Kecamatan Samigaluh Dalam Angka 2021. Katalog BPS kecamatan Samigaluh.
- Ma'arif, A., & Rahmat Setiawan, N. (2021). Control of DC Motor Using Integral State Feedback and Comparison with PID: Simulation and Arduino Implementation. *Journal of Robotics and Control (JRC)*, 2(5), 456-461. doi:<https://doi.org/10.18196/jrc.25122>

- Ma'arif, A., Nabila, H., & Wahyunggoro, O. (2019, November). Application of intelligent search algorithms in proportional-integral-derivative control of direct-current motor system. In *Journal of Physics: Conference Series* (Vol. 1373, No. 1, p. 012039). IOP Publishing. <https://doi.org/10.1088/1742-6596/1373/1/012039>
- Maharani, D. D. *Pembuatan aplikasi visualisasi 3 dimensi kaca mata menggunakan metode box modeling berbasis android (studi kasus: rumah kaca mata indah optik)* (Bachelor's thesis, Fakultas Sains Dan Teknologi Universitas Islam Negeri Syarif Hidayatullah Jakarta).
- Mulyono, S., Markus, A. H., & Mulyani, W. (2022). *Laundry wastewater treatment using active carbon media from coconut shell, matoa shaws powder, iron and lingua wood*. *Biolink (Jurnal Biologi Lingkungan Industri Kesehatan)*, 9(1), 106-115.
- Nareswari T, D. N. (2018). *Analisis Preferensi Konsumen Jam Tangan Kayu dengan Metode Analytical Hierarchy Process* (Doctoral dissertation, Universitas Gadjah Mada)
- Payne, A. & Frow, P. , (2013). "Strategi" Customer Management", Cambri" ge
- Prianto, E., & Eng, M. (2017). Proses permesinan cnc dalam pembelajaran simulasi CNC. *Jurnal Edukasi Elektro*, 1(1).
- Setiawan R. (2020). *Prototipe Media Pembelajaran Historical Interactive Virtual Reality*. Laporan Penelitian UNY. Tidak dipublikasikan.
- Setiawan R. (2021). *Prototipe Storyboard Virtual Reality History of Java*. Laporan Penelitian UNY. Tidak dipublikasikan.
- Setiawan, N. (2019). *Sistem kendali orientasi quadrotor berbasis so (3) dengan linierisasi pada moving operating point* (Doctoral dissertation, Universitas Gadjah Mada)
- Setiawan, N., & Pratama, G. N. P. (2021, November). Application of LQR Full-State Feedback Controller for Rotational Inverted Pendulum. In *Journal of Physics: Conference Series* (Vol. 2111, No. 1, p. 012006). IOP Publishing. <https://doi.org/10.1088/1742-6596/2111/1/012006>
- Setiawan, R. (2017). PKM HOME INDUSTRI JENANG DI KABUPATEN KUDUS. *Jurnal Pawiyatan* Vol 25. No.2 <http://e-journal.ivet.ac.id/index.php/pawiyatan/article/view/711>
- Setiawan, R. (2021). *Vaname shrimp farm cultivation with microbubble technology in Mirit Kebumen Regency*. ICERI 4th Universitas Negeri Yogyakarta.
- Setiawan, R., Nugroho, A. N. P., Hadi, K., Laksana, N. Y., & Widiyanto, H. W. (2021). Historical interactive virtual reality learning in college. *Harmoni Sosial: Jurnal Pendidikan IPS*, 8(2), 73-79. <http://dx.doi.org/10.21831/hsjpi.v8i2.46831>
- Setiawan, R., Yuliantri, R. D. A., & Rosyadi, S. (2023). Pengembangan Komunitas Taman Wisata Bunga Matahari Pantai Glagah Kulon Progo Yogyakarta. *Manggali*, 3(1), 11-27. <https://doi.org/10.31331/manggali.v3i1.2329>.
- Surono, S., & Harjanto, C. T. (2019). Pengembangan Paket Latihan dan Penilaian Berbantuan Komputer untuk Pembelajaran Alat Ukur Mekanik Presisi. *Jurnal Dinamika Vokasional Teknik Mesin*, 4(2), 134-143 <https://doi.org/10.21831/dinamika.v4i2.27399>
- Parker, R. (2019). "Application of 2-Axis CNC Machine Tools in Craft Production." *Journal of Manufacturing Processes*, 46, 23-35.
- Sadiq, M., & Yusof, N. (2017). "Empowerment of Local Communities in Furniture Making through CNC Technology." *International Journal of Community Development*, 12(4), 72-80.
- Jannah, D. (2020). "The Role of Technology in Enhancing Productivity: A Case Study of CNC in Small Business Manufacturing." *Proceedings of the International Conference on Innovation and Entrepreneurship*, 109-115.
- Hartanto, D., & Ahmad, Z. (2021). "Utilization of CNC Laser for Efficient Woodworking Production." *Journal of Industrial Engineering and Management*, 15(2), 245-257.
- Liu, F., Zhang, Y., & Zhou, Q. (2018). "Laser Cutting Technology: Innovations and Applications in the Manufacturing Industry." *Journal of Laser Technology*, 29(6), 204-211.
- Mulyono, R. (2022). "Woodworking Craft Innovation with CNC Laser Cutting." *International Journal of Design and Crafting*, 19(2), 150-160.
- Sundaram, V., & Kumar, D. (2020). "Impact of CNC Technology on Woodcraft and Small Enterprises." *Journal of Business and Technology*, 10(1), 55-64.
- Aziz, R., & Yatim, N. (2021). "Technological Empowerment in Local Craft Industries: Case Study on CNC Machines in Yogyakarta." *Journal of Local Economic Development*, 9(3), 89-101.
- Han, L., & Wei, X. (2018). "Innovation in Craft Production: An Exploration of CNC Technology and Its Market Potential." *International Journal of Innovative Manufacturing*, 32(4), 112-120.
- Santoso, D., & Prasetyo, A. (2021). "Application of CNC Laser Technology in Improving Crafting Efficiency in Small Businesses." *Procedia Manufacturing*, 54, 203-208.
- Indra, T., & Harjo, M. (2022). "Enhancing Productivity in Small Business Crafting with CNC Machines: Challenges and Opportunities." *Journal of Engineering and Technology*, 16(1), 95-105.
- Kusuma, A., & Agung, P. (2019). "The Role of CNC in Empowering Handicraft Industry: A Case Study of Wooden Watches." *International Journal of Industrial Engineering*, 28(7), 45-53.
- Arif, F., & Reza, K. (2020). "CNC Laser Technology for Efficient Wood Processing in Craft Production." *Journal of Materials Science and Engineering*, 24(5), 233-240.

- Widianto, T., & Haryanto, R. (2021). "Productivity Improvement and Waste Reduction in Wooden Crafting with CNC Technology." *Asian Journal of Manufacturing Engineering*, 10(3), 88-97.
- Rudyanto, S., & Sukarno, H. (2019). "The Impact of CNC Laser on the Growth of Handicraft SMEs." *Business and Technology Journal*, 12(4), 123-134.
- Mardiana, I., & Agus, S. (2020). "Empowering Small Enterprises with CNC Technology: Innovations in Wooden Watches." *Proceedings of the International Conference on SME Development*, 78-86.
- Lestari, M., & Santosa, B. (2020). "The Adoption of CNC Laser Machines in the Crafting Industry for Enhancing Competitiveness." *Technology and Innovation Journal*, 22(1), 101-108.
- Zulfiqar, A., & Kurniawan, D. (2018). "Sustainability in the Handicraft Industry: Leveraging CNC Machines for Environmental Impact Reduction." *International Journal of Sustainable Development*, 14(6), 345-356.
- Subroto, H., & Agung, R. (2019). "Improvement of Craft Product Quality Using CNC Machines: A Study on Wooden Crafts." *Proceedings of the National Conference on Manufacturing Technology*, 210-215.
- Sari, M., & Wijaya, H. (2021). "Incorporating CNC Laser Technology for Enhancing Precision in Woodworking Crafts." *International Journal of Crafting and Design*, 18(4), 177-185.



Developing digital platform to assess interests and talents at senior high school students

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-10-07 Revised: 2025-03-02 Accepted: 2025-03-25 Published: 2025-04-12 Keywords Website Talent interest Training	In today's digital era, fostering students' interests and talents is important. This study addresses the challenge of students struggling to identify and develop their potential, hindering their character development and limiting their success in a digitally connected world. This activity aimed to develop a digital platform to optimize student potential by providing personalized recommendations based on established assessment methods: Holland's RIASEC and Multiple Intelligence System (MIS). Conducted at SMAN 1 Lhokseumawe with 50 student participants, the project involved observation, website development, socialization, and ongoing refinement. The developed website provides students with personalized assessments and extracurricular recommendations, while also offering management tools for teachers, school operators, and the principal. Initial surveys revealed that while students were interested in extracurricular activities, many lacked clarity regarding their talents and the alignment of those talents with their chosen activities. It is expected that this digital tool will not only enhance student self-awareness and character development but also contribute to improved student achievement and school branding, ultimately preparing students for success in the evolving digital landscape.
Kata Kunci Website Minat bakat Pelatihan	Mengembangkan Platform Digital Untuk Menilai Minat Dan Bakat Siswa Sekolah Menengah Atas. Di era digital saat ini, menumbuhkan minat dan bakat siswa merupakan hal yang sangat penting. Dalam kegiatan ini permasalahan utama yang diangkat adalah tantangan siswa dalam mengidentifikasi dan mengembangkan potensi diri. Hal ini perlu diperhatikan karena akan menghambat pengembangan karakter dan membatasi keberhasilan mereka di dunia yang terhubung secara digital apabila tidak diatasi sejak dini. Kegiatan ini bertujuan untuk mengembangkan platform digital guna mengoptimalkan potensi siswa dengan memberikan rekomendasi yang dipersonalisasi berdasarkan metode penilaian yang telah ditetapkan dengan metode RIASEC dan Multiple Intelligence System (MIS). Kegiatan dilaksanakan di SMAN 1 Lhokseumawe dengan 50 peserta siswa, yang terdiri dari kegiatan observasi, pengembangan web, sosialisasi, dan penyempurnaan yang berkelanjutan. Situs web yang dikembangkan menyediakan penilaian yang dipersonalisasi serta rekomendasi ekstrakurikuler bagi tiap siswa, sekaligus menawarkan perangkat manajemen bagi guru, operator sekolah, dan kepala sekolah. Survei awal mengungkapkan bahwa meskipun siswa tertarik pada kegiatan ekstrakurikuler, banyak yang kurang mengetahui minat bakat mereka dan keselarasan minat bakat tersebut dengan ekstrakurikuler yang mereka pilih. Diharapkan website ini tidak hanya akan meningkatkan kesadaran diri dan pengembangan karakter siswa, tetapi juga berkontribusi pada peningkatan prestasi siswa dan pencitraan sekolah, yang pada akhirnya mempersiapkan siswa untuk meraih keberhasilan dalam dunia digital yang terus berkembang.

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INTRODUCTION

Developing students' interests and talents through digital literacy is a relevant strategy in today's digital era (Aini & Pramasdyahsari, 2023). Digital literacy includes the ability to use information and communication technology effectively, critically, and creatively (Jordan et al., 2024)(Fitriyani & Teguh Nugroho, 2022). By implementing digital literacy, students can develop the skills needed to succeed in an increasingly digitally connected world (Sindar et al., 2023). Some steps that can be taken to develop students' interests and talents through digital literacy are introducing students to various types of relevant digital technologies and applications and encouraging students to be creative in using digital technology to express their interests and talents. It also provides opportunities for students to collaborate online with fellow students or experts in their fields of interest and talent. It integrates digital literacy into the curriculum so students can learn while developing technological skills. Digital literacy can be a good or bad thing depending on its use and supervision level (Fajri & Irwan Padli Nasution, 2023). With the right application of digital literacy, schools can help students optimize their potential, broaden their horizons, and prepare them for success in the ever-evolving digital era (Dewi et al., 2021).

The Sustainable Development Goal (SDG) 4, which focuses on quality education, is closely related to nurturing students' talents and interests. Quality education aims to provide all students with the resources and opportunities they need to discover and develop their talents regardless of background (Chotibuddin et al., 2024). This inclusivity allows diverse interests to flourish. It promotes teaching methods that cater to individual learning styles and interests. This can help students engage with subjects that resonate with them, fostering deeper exploration of their talents. A focus on quality education encourages the development of critical thinking and creative skills. These competencies allow students to explore their interests innovatively and think outside the box. A strong educational foundation equips students with the skills needed in various fields, helping them align their interests with potential career pathways in sectors like technology, environment, arts, and social sciences (Wiranata et al., 2024). By prioritizing quality education, we can create environments where students feel empowered to explore their interests, cultivate their talents, and contribute to a more sustainable and equitable world (Nirzam & Ramadhan, 2023).

Therefore, this activity is important to do with the hope that it can be used as a consideration for students and teachers in developing students' interests and talents in digital literacy (Onuorah, 2023). Through the materials provided and the interest and talent tests carried out, it is hoped that it can benefit students and teachers to find out their interests and talents and how to apply them to become something more positive and useful (Handiyani & Abidin, 2023). This material is also useful for teachers as a recommendation for students with talents to create projects and groupings for each student's interests and talents (Mario et al., 2024). Teachers can also guide it according to the subject area. Therefore, the problem formulation is that many children do not understand how to develop their interests and talents (Putra et al., 2024), which greatly influences student character development (Dewi et al., 2021). There is an influence between digital literacy in improving the quality of learning (Febianti et al., 2023). The lack of student interest in digital literacy limits the development of student interests and talents. This study can optimize the development of student interests and talents to help shape student character. It can improve students' digital literacy so that students can work and channel their talents without limits.

Based on these problems, this community service aims to develop a digital platform, a website (Rahmadani et al., 2025), that utilizes established assessment using Holland's RIASEC and Multiple Intelligence System (MIS) methods. The website provides students with personalized recommendations based on student responses. This initiative empowers students in their personal development and streamlines extracurricular and student resources management for schools (Zakariyah et al., 2023). Ultimately, the activity seeks to optimize student potential, enhance character development, and improve digital literacy, ensuring students are well-prepared for success in an increasingly digital world.

METHOD

This activity was carried out at SMAN 1 Lhokseumawe with a trial target of 50 students in grades X and XI. This school was chosen because it has received and understood information related to digital literacy before (Sahputra et al., 2023), so it is predicted that this website will be easier to implement. This activity was carried out in several steps (Figure 1):

- a. Observation: The community service team will conduct a preliminary study to identify the needs of the school, starting from how the school determines students' interests and talents, the method of selecting extracurricular activities, and the types of extracurricular activities provided by the school. This activity is carried out by involving students, discussions and interviews with the principal and vice principal for student affairs.
- b. Development of the Interest and Talent Assessment Website: The community service team will organize a series of website creations to make it easier for schools to determine students' interests and talents in character building (Delov & Yuldoshov, 2024). The assessment will direct students to conclusions about certain interests and talents and will be given the right choice of extracurricular activities according to those available at the school. The website is equipped with accounts for users/students, BK teachers, school operators and the principal or vice principal for student affairs.
- c. Socialization: After the website is created, participants will be invited to take part in the socialization and website trial, where they will find out their interests and talents in extracurricular activities at school. Students and teachers

will be accompanied for mentoring and assistance sessions that are expected to help identify unknown interests and talents through extracurricular activities at school. Talent assessment uses the Holland (RIASEC) method (Pramudawardani, N. K. P., & Adiati, 2024), while to identify interests using the Multiple Intelligence System (MIS) method (Sánchez-Martín et al., 2017). Before the socialization is carried out, it is necessary to know the picture of students' understanding of their interests and talents as well as the condition of extracurricular activities at school, so that at the beginning of the activity a survey is conducted to the students involved. Extracurricular is important at school as it is one of the techniques to gather students based on their interests and talents in a structured organization (Khotimah & Kamila, 2022). After the socialization is carried out, a survey is also conducted to assess the appearance and performance of the website.

- d. Website Improvement and Development: After obtaining input from the results of the socialization, the team makes improvements and develops the website based on the input.
- e. Mentoring and Assistance: Mentoring and assistance are carried out in more depth after the website is developed according to input.

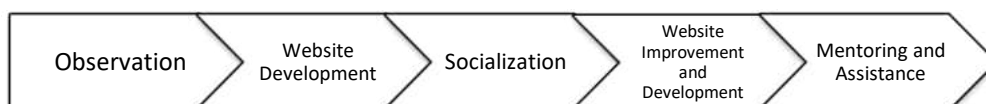


Fig 1. Talent Interest Assessment Flowchart

RESULTS AND DISCUSSION

This community service activity is carried out in the form of fostering the development of students' interests and talents through the website. It is hoped that with this activity, there will be an increase in students' knowledge and skills in utilizing digital technology effectively, critically, and creatively. The initial stage of this activity began with observation at SMA Negeri 1 Lhokseumawe to identify students' interests and needs relate to extracurricular at school (Figure 2). After that, an interview was conducted with the school to find out how to choose extracurricular and extracurricular activities available at the school (Figure 3). This needs to be done as an initial overview to build a website that will direct students to choose extracurricular activities according to their talents and interests.



Fig 2. Observation activities at SMAN 1 Lhokseumawe



Fig 3. Initial data collection activities on student interests and talents

Furthermore, the results of the problem mapping will be followed up with a series of activities tailored to the needs of partners, including an understanding of talent interest method through website platform, planning an application

system, and methods of publishing talent and interests through digital technology. The process of this activity aims to optimize students' potential and prepare them for success in the digital era.

The community service activities carried out have a very positive influence and impact in supporting and optimizing the development and distribution of students' talents and interests. Digital implementation can make it easier to identify the level of compatibility between students' talents and interests with extracurricular activities that students will follow in the future at SMAN 1 Lhokseumawe. Here is the link and appearance of the student's talent and interest website: <https://minatbakatsiswa.unimal.ac.id/>

This website can be managed by several users, namely: (1) school operators who can manage student data and school extracurricular data; (2) Counseling guidance teachers who can manage the extracurricular registration selection process; (3) students who can take talent interest tests and register for extracurricular activities; and (4) school principals to manage reporting of these activities. The application consists of several main menus, the following is a display of several menus for each user:

1. On the student's home page, an assessment form will be displayed containing some tests related to students' abilities and willingness using Holland (RIASEC) method and MIS method. After filling in all the interest and talent assessment questions, the Assessment Results page will be displayed along with extracurricular recommendations (see Figure 4).

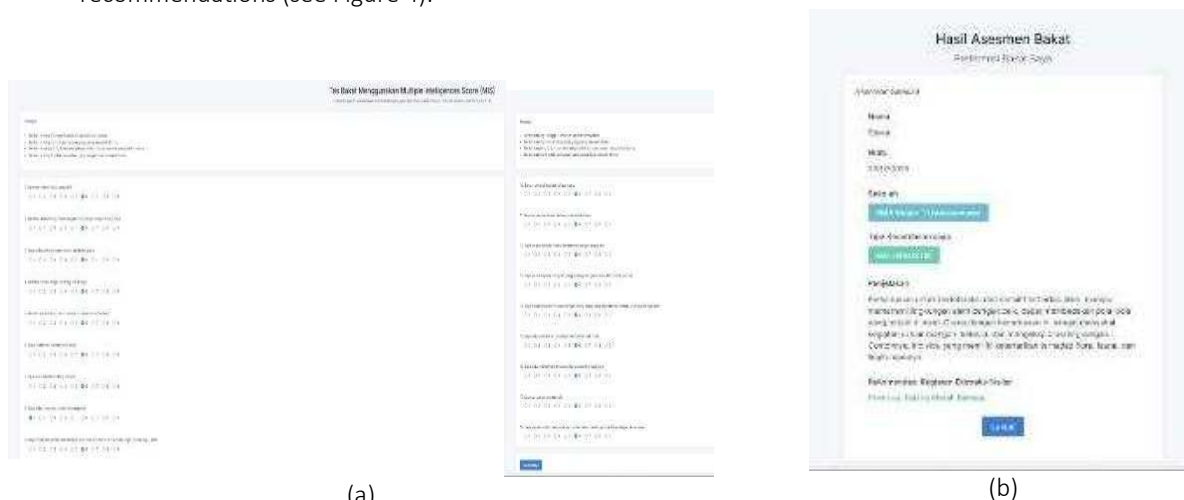


Fig 4. Student user view; (a) Questionnaire to identify students' interests and talents; (b) Results of the assessment of talent interest

2. On the teacher page will be displayed the student data menu, extracurricular, achievement and personal data (Figure 5). The teacher user is used to manage the selection process, and extracurricular registration, distribution of teacher, student coaching and channeling student talents.

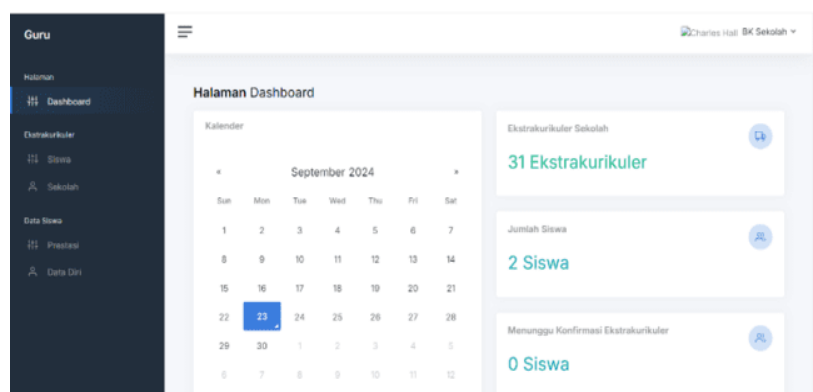


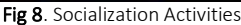
Fig 5. Teacher user view

3. On the school operator page will be displayed, the student data, extracurricular, achievement and personal data menus (Figure 6). The school operator user is used to manage student data, extracurricular data, and publication of student work and achievements.

Fig 6. School operator user display

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- The screenshot displays a web application interface for a school operator. The sidebar on the left contains navigation links for various sections: Dashboard, Akun, Siswa, Guru, Sekolah, Data Penilaian, and Data Kedis. The main dashboard area, titled 'Halaman Dashboard', features a calendar for September 2024. The calendar shows dates from 1 to 30, with the 29th highlighted in blue. To the right of the calendar, there are two summary cards: 'Jumlah Akun Guru' showing '1 Akun' and 'Jumlah Akun Siswa' showing '2 Akun'. The top right corner shows the user 'Charles Hall' and the role 'Operator Sekolah'.

After the website was developed, the next step was to conduct outreach to students. Activities at this stage are assistance in the use of the website including procedures, work procedures and operations of the digital platform for student interests and talents as well as coaching and accommodating student talent and interest (Figure 8).



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Tabel 1. Student Talent and Interest Existing Condition

No.	Indicator	Percentage (%)	
		Yes	No
1	Are you interested in joining extracurricular activities at school?	95	5
2	Will the extracurricular activities you are interested in be useful?	94	6
3	Do you know your talent?	76	24
4	Do the extracurricular activities you are interested in match your talents?	78	22
5	After participating in these extracurricular activities, have your talents and interests been channeled?	84	16

Figure 9 shows the level of student interest in the extracurricular activities they were currently participating in. It turned out that there were still a small number of students who answered that they were quite interested and the majority answered that they were interested in their current extracurricular choices. With this activity, it can help students in knowing or finding their interests and talents, so that the activities chosen are more optimal and can help improve student achievement (Wiranata et al., 2024). From this community service activity, it is hoped that it can improve student achievement in the field of school extracurricular activities. And this website also helps teachers and schools in managing extracurricular activities in schools, including in terms of reporting and documentation which have so far been done manually.

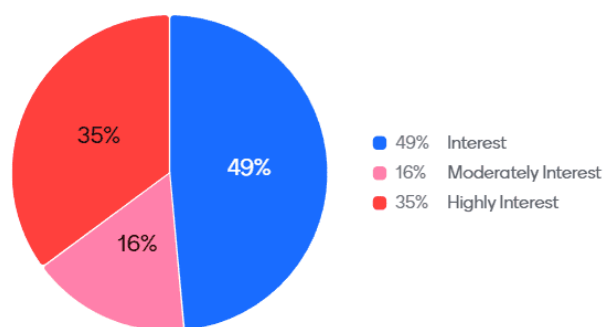


Fig 9. The level of student interest in the extracurricular activities they participate in

In developing talents and interests, many factors influence this, not only activities and events at school (Yohana et al., 2020) but also quality and intensity of counseling, the school environment, teacher involvement (Yulia et al., 2022), parent participation (Đurišić & Bunijevac, 2017), social background (Rasmussen & Rasmussen, 2015) and learning activities, such as actively involving in competition (Hidayat et al., 2023). Parents play a crucial role in children's learning by providing guidance, supervision and facilitating access to information aligned with student interests and talents (Muallimin et al., 2023).

CONCLUSION

The Talent Interest Website has been well developed and can help students to identify their talents and interests related to extracurricular selection. Thus, the management of student interests and talents in schools can be more focused and structured, and provide greater benefits for the development of student potential at various levels and also school branding. The suggestions in implementing talent interest website, are: (a) the website can implement in all schools to manage interest and talent tests and also manage extracurricular activities in schools; (b) It also can implement to help student decide specialization class require by the newest Kampus Merdeka curriculum. The limitation of this activity is that the assessment used are not generalizable to the findings in diverse educational contexts. Future development opportunities are expanding the platform to incorporate diverse talent and interest assessment tools, implementing the website to other educational levels, institutions and the general public.

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REFERENCES

- Aini, S. N., & Pramasdyahsari, A. S. (2023). Pendampingan Simulasi Asesmen Kompetensi Minimum berbasis Literasi Digital untuk Meningkatkan Kemampuan Literasi Numerasi dan Adaptasi Teknologi Siswa Sekolah Dasar. *Jurnal Pengabdian Masyarakat Bangsa*, 1(6), 573–583. <https://doi.org/10.59837/jpmmba.v1i6.210>
- Chotibuddin, M., Zunaih, A. I., Musbikhin, & Nashihin. (2024). Quality Education with Sustainable Development Goals (SDGs) No 4: Knowledge-based. *Journal of Ecohumanism*, 3(8). <https://ecohumanism.co.uk/joe/ecohumanism/article/view/5676>
- Delov, T., & Yuldoshov, F. (2024). Effectiveness of using information technologies in determining talent requirements. *AIP Conference Proceedings*, 3147(1), 60005. <https://doi.org/10.1063/5.0210417>
- Dewi, D. A., Hamid, S. I., Annisa, F., Oktafianti, M., & Genika, P. R. (2021). Menumbuhkan Karakter Siswa melalui Pemanfaatan Literasi Digital. *Jurnal Basicedu*, 5(6), 5249–5257. <https://doi.org/10.31004/basicedu.v5i6.1609>
- Đurišić, M., & Bunijevac, M. (2017). Parental Involvement as a Important Factor for Successful Education. *Center for Educational Policy Studies Journal*, 7(3), 137–153. <https://doi.org/10.26529/cepsj.291>
- Fajri, F., & Irwan Padli Nasution, M. (2023). Literasi Digital: Peluang Dan Tantangan Dalam Membangun Karakter Peserta Didik Digital Literacy: Opportunities and Challenges in Building Student Character. *Intelegensia: Jurnal Pendidikan Islam*, 11(01), 34–46.
- Febianti, Y. N., Herawan, E., & Safitri, A. L. (2023). Digital Literacy and Student Creativity Through E-Resources on the Quality of Learning in College. *Journal of Education Technology*, 7(1), 25–33. <https://doi.org/10.23887/jet.v7i1.436>
- Fitriyani, F., & Teguh Nugroho, A. (2022). Literasi Digital Di Era Pembelajaran Abad 21. *Literasi Jurnal Pengabdian Masyarakat Dan Inovasi*, 2(1), 307–314. <https://doi.org/10.58466/literasi.v2i1.1416>
- Handiyani, M., & Abidin, Y. (2023). Peran Guru dalam Membina Literasi Digital Peserta Didik pada Konsep Pembelajaran Abad 21. *Jurnal Elementaria Edukasia*, 6(2), 408–414. <https://doi.org/10.31949/jee.v6i2.5360>
- Hidayat, A. Z., Zulaikha, S., & Rochanah, S. (2023). Evaluation of Student Interest and Talent Development Program At YASPORBI 1 Elementary School. *International Education Trend Issues*, 1(3), 143–152.
- Jordan, A., Julianto, A., & Firmansyah, M. A. (2024). *Integrating Digital Literacy into Curriculum Design a Framework for 21 st Century Learning*. 1(2), 79–85.
- Khotimah, N., & Kamila, F. S. (2022). SAIZU INTERNATIONAL CONFERENCE ON TRANSDISCIPLINARY RELIGIOUS STUDIES (SAIZU ICON-TREES) Proceeding of 2 nd Internasional Conference on Strengthening Religious Values on Transdisciplinary Studies in Modern Technology Era The Trends of Digital Da’ wah : *Proceeding of 2nd Internasional Conference on Strengthening Religious Values on Transdisciplinary Studies in Modern Technology Era*, 1–11.
- Mario, A., Mulia, A., Samcha, N. D., & Avia, N. (2024). Mengembangkan Minat dan Bakat melalui Program Asesmen pada Siswa SMP. *Junal Studi Multidisipliner*, 8(12), 691–695.
- Muallimin, E. Z., Fridani, L., & Nurjannah. (2023). Teacher Strategies in Efforts to Improve Digital Literacy Skills of Children Aged 7-8 Years (Case Study on Elementary School Teachers in South Jakarta). *EDUTEC: Journal Of Education and Technology*, 7(2), 690–704.
- Nirzam, M., & Ramadhan, P. (2023). The Role of SDG 4: Quality Education on the Internationalization of Indonesia’s Education. *Hasanuddin Journal of Strategic and International Studies (HJSIS)*, 1(2), 39–51. <https://doi.org/10.20956/hjsis.v1i2.27442>
- Onuorah, L. (2023). Talent Management in The Digital Age: Challenges and Opportunities. *Journal of the Managament Sciences*, 60(1).
- Pramudawardani, N. K. P., & Adiati, R. P. (2024). *Holland ’ s RIASEC Model : Career and Job Development Assessment for Personnel Administration Staff Holland ’ s RIASEC Model : Asesmen Pengembangan Karier dan Kerja pada Personnel Administration Staff*. 13(3), 361–370.
- Putra, I., Siregar, N. I., & Maizana, D. (2024). Exploring Talent And Interests Through The Harapan Foundation And The University Of Medan Area. *International Journal of Community Service Implementation*, 2(3), 251–258.
- Rahmadani, L., Darni, R., & Novaliendry, D. (2025). APPLICATION OF TALENT TEST USING AN EXPERT SYSTEM IN DETERMINING EXTRACURRICULAR ACTIVITIES FOR PUBLIC TSANAWIYAH STUDENTS (MTSN) 3 SOUTH COAST USING A FORWARD CHAINING APPROACH. 64–69. <https://doi.org/10.24036/int.j.emerg.technol.eng.educ.v1i2.30>
- Rasmussen, A., & Rasmussen, P. (2015). Conceptions of student talent in the context of talent development. *International Journal of Qualitative Studies in Education*, 28(4), 476–495. <https://doi.org/10.1080/09518398.2014.916013>
- Sahputra, I., Pratama, A., Fachrurrazi, S., Muthmainnah, M., & Saptari, M. A. (2023). Meningkatkan Semangat Literasi Digital Pada Generasi Millenial Dalam Penangkalan Berita Hoaks. *Jurnal Malikussaleh Mengabdi*, 2(1), 283. <https://doi.org/10.29103/jmm.v2i1.12358>
- Sánchez-Martín, J., Álvarez-Gragera, G. J., Dávila-Acedo, M. A., & Mellado, V. (2017). What do K-12 students feel when dealing with technology and engineering issues? Gardner’s multiple intelligence theory implications in technology lessons for motivating engineering vocations at Spanish Secondary School. *European Journal of Engineering*

Education,

42(6).

<https://www.tandfonline.com/doi/full/10.1080/03043797.2017.1292216?scroll=top&needAccess=true>

- Wiranata, F. E., Putri, I. S., & Christina, M. M. (2024). Pendampingan Asesmen Minat dan Bakat Siswa SMA Imanuel Kalasan dalam Menghadapi Disrupsi Teknologi. *Jurnal Atma Inovasia*, 4(1), 17–22. <https://doi.org/10.24002/jai.v4i1.8339>
- Yohana, C., Agung, I., Perdana, N. S., & Silisabon, S. (2020). A study of factors influencing the development of student talent. *International Journal of Education and Practice*, 8(3), 441–456. <https://doi.org/10.18488/journal.61.2020.83.441.456>
- Yulia, R., Henita, N., Gustiawan, R., & Yeni Erita. (2022). Efforts to Strengthen Character Education for Elementary School Students by Utilizing Digital Literacy in Era 4.0. *Journal of Digital Learning and Distance Education*, 1(6), 240–249. <https://doi.org/10.56778/jdlde.v1i6.39>
- Zakariyah, M. F., Riyanto, Y., Lestari, G. D., & Zawawi, A. A. (2023). Implementation of Digital Literacy in the Development of Extracurricular Programs. *Jurnal UNNES*, 17(1), 67–76.



Empowering Kelon (Oncology Class) in Screening and Early Detection of Breast Cancer in The South Pekalongan Health Centre Working Area

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-06-03 Revised: 2024-12-02 Accepted: 2025-03-24 Published: 2025-04-14 Keywords Kelon (Oncology Class) Breast Cancer Early Detection Screening Breast Self Examination (BSE)	Breast cancer has the highest incidence of all cancers in Indonesia. Breast cancer is a type of cancer that often occurs in women, especially in women who are close to 50 years old. Breast cancer in Indonesia is often found in an advanced stage and is already difficult to treat. Efforts can be made to reduce the incidence of advanced breast cancer by conducting routine breast examinations. Early screening measures need to be done to detect abnormal cells before they develop into deadly cancer. With these examinations carried out regularly, the discovery or screening and early detection can reduce the incidence of advanced breast cancer. The aim of this activity is to increase the knowledge and skills of the health cadres so that they can become proficient in conducting the BSE examination. Furthermore, cadres are also expected to be able to teach other women of childbearing age in the area where they live. This activity was carried out at the South Pekalongan Health Center, which was attended by 34 cadres of Posbindu South Pekalongan Health Center in the form of counseling with lecture and question and answer methods and demonstrations on Breast Self Examination (BSE). Pretest and Posttest were conducted to measure cadres' knowledge before and after education. The results of this level of service can increase the knowledge of respondents, which initially the majority of respondents' knowledge level in the poor category was 66% in the poor category and after being given education the level of knowledge became 90% in the very good category. Similar activities are needed for coaching posyandu cadres to have health maintenance skills, especially screening and early detection of breast cancer. Of course, support and participation from residents and village officials are needed.
Kata Kunci Kelon (Kelas Onkologi) Kanker Payudara Deteksi Dini Screening Breast Self Examination (BSE)	Pemberdayaan Kelon (Kelas Onkologi) dalam Skrining dan Deteksi Dini Kanker Payudara di Wilayah Kerja Puskesmas Pekalongan Selatan. Kanker payudara merupakan kanker dengan insiden tertinggi untuk semua jenis kanker di Indonesia. Kanker payudara adalah jenis kanker yang sering terjadi pada wanita, terutama pada wanita yang usianya menjelang 50 tahun. Kanker payudara di Indonesia seringkali ditemukan sudah dalam stadium lanjut dan sudah sulit untuk dilakukan pengobatan. Upaya yang dapat dilakukan untuk menurunkan insiden kanker payudara stadium lanjut yaitu dengan melakukan pemeriksaan payudara secara rutin. Tindakan skrining dini perlu dilakukan untuk mendeteksi sel-sel abnormal sebelum berkembang menjadi kanker yang mematikan. Dengan pemeriksaan tersebut yang dilakukan teratur maka penemuan atau skrining dan pendeteksian secara dini dapat mengurangi angka kejadian kanker payudara stadium lanjut. Tujuan kegiatan ini diharapkan dapat meningkatkan pengetahuan dan skill para kader kesehatan sehingga mereka dapat menjadi tenaga yang mahir dalam melakukan pemeriksaan BSE tersebut. Lebih lanjut, kader juga diharapkan dapat mengajarkan kepada para wanita usia subur lainnya di wilayah tempat tinggalnya. Kegiatan ini dilaksanakan di Puskesmas Pekalongan selatan yang diikuti oleh 34 kader posbindu Pukesmas Pekalongan Selatan berupa penyuluhan dengan metode ceramah tanya jawab serta demonstrasi mengenai Breast Self Examination (BSE). Pretest dan Posttest dilakukan untuk mengukur pengetahuan kader sebelum dan sesudah diberikan edukasi. Hasil pengabdian tingkatat ini, dapat meningkatkan pengetahuan responden yang semula mayoritas tingkat pengetahuan responden pada kategori kurang sebesar 66% pada kategori kurang dan setelah diberikan edukasi tingkat pengetahuan menjadi 90% pada kategori sangat baik. Kegiatan serupa dibutuhkan untuk pembinaan kader posyandu agar memiliki keterampilan pemeliharaan Kesehatan khususnya screnning dan deteksi dini kanker payudara. Tentunya dibutuhkan dukungan dan peran serta dari warga dan perangkat desa.

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INTRODUCTION

Cancer is a disease that contributes to the high mortality rate worldwide. Cancer is a condition where the body's cells divide out of control and become malignant. These cells grow very quickly and can spread to other organs of the body, causing complications. The most common cancer in women is breast cancer (Donnelly, 2013). The spread of breast cancer, also known as metastases, can be through blood circulation or lymph circulation, where these complications can worsen the patient's health status until it leads to death. Based on epidemiological studies, it was found that the incidence of breast cancer is not only in developing countries such as Indonesia but also in developed countries (Kemenkes RI, 2016).

Breast cancer or mammary cancer is a malignancy in breast tissue that can originate from the duct epithelium or originate from the lobe (Kapenhas-Valdes et al., 2008), breast cancer is a malignant tumour that originates from the glandular duct. Breast cancer is a malignancy in breast tissue that usually originates from the epithelium of the ducts or lobules (Soekersi, 2022). The breast generally consists of two types of tissue, namely, glandular tissue (glands) and stromal tissue (support). Breast cancer cells can hide in the body for years without being noticed and suddenly activate into malignant or cancerous tumours (Yuniastini, 2022)

Breast cancer is the second leading cause of cancer mortality for US women, despite a steady overall decline in breast-cancer mortality rates over the past 20 years. The average age-adjusted rate for the years 2016-2020 was 19.6 per 100 000, with an estimated 43 170 deaths in 2023 ((Henderson, 2024). Based on data from GLOBOCAN in 2020, the total number of cancer patients in Indonesia regardless of gender is 396,914 patients with the number of breast cancer patients around 65,858 (16.6%) of the total cancer (International Agency for Research on Cancer, 2021). This makes breast cancer the cancer with the highest incidence for all types of cancer in Indonesia.

In 2024, approximately 310,720 new cases of invasive breast cancer and 56,500 cases of DCIS will be diagnosed among US women, and 42,250 women will die from breast cancer. The majority of invasive breast cancer cases (84%) and deaths (91%) occur among women aged 50 years and older, with about one half (52%) of all deaths in women aged 70 years or older (Giaquinto, 2022). Breast cancer in Indonesia is often found in an advanced stage and is already in a difficult condition for treatment, because the prognosis of breast cancer is closely related to the stage at the time of cancer diagnosis. Early detection measures need to be taken in order to detect abnormal cells in the body early so that they can be found before they develop into deadly cancer (Crosby et al., 2022). One of the efforts to reduce the prevalence of morbidity and mortality due to breast cancer, screening or early detection is very important to do). Furthermore, early detection efforts can be carried out in the form of mammography, clinical breast examination, and breast self-examination (BSE). These three methods are effective methods for screening and early detection of breast cancer. Even though BSE is declared insufficient as a screening method for early detection of breast cancer. However, the method is still used as an important screening method for early detection, especially in developing countries such as Indonesia with the consideration that the method is considered cheap, easy to implement, and does not require complex training. Through breast self-examination or BSE, women will become familiar with the anatomical structure of their breasts, so that any changes in the breast structure will be easily recognised (Yuhanah, 2019).

Before breast cancer screening, ordinary people also need to be given an understanding of breast cancer itself, this is because low understanding can also be a contributing factor to increasing the incidence of breast cancer in an area. The results of a study conducted in Pakistan showed that most women had moderate knowledge of breast cancer (59%), and television was the main source for their knowledge related to breast cancer (Khokher, Qureshi, Mahmood, Saleem, & Mahmud, 2011). These results are also in line with research conducted in Indonesia where for the level of knowledge of women related to breast cancer most (37%) are in the moderate category (Sihita, Nurchayati, & Hasneli, 2019).

The number of women who underwent screening for early detection of cervical cancer and breast cancer in Central Java in 2021 was reported to be 33,116 women or 0.6 per cent of women aged 30-50 years. This percentage is still very far from the target (10 per cent). Based on data from the Pekalongan City Health Office in 2020, the percentage of WUS with lumps on CBE examination out of 546 WUS found 22 WUS (4.03%) with lumps. Based on data from the South Pekalongan Puskesmas profile in 2022, the number of women of childbearing age is around 23,016 people, women of childbearing age are around 14,951 people, and the number of women of menopausal age is around 1,567 people, so that the total risk group for breast health problems is 13,384 people or 20.13% of the total population (66,461 people).

The high number of people in the risk category for breast health problems and the absence of health cadres trained to conduct Breast Self-Examination cause the issue of breast health and early detection of breast cancer incidence to be urgent to address. Given the dangers of breast cancer, namely complications in other organs that lead to death. Therefore, it is important to conduct KELON (Oncology Class) empowerment activities in breast cancer screening and early detection in the South Pekalongan Puskesmas working area in order to detect abnormal cells in the body early so that they can be found before developing into deadly cancer. This concern is in line with SDG 3, the new goal for worldwide Good Health promotes healthy lifestyles, preventive measures and modern, efficient healthcare for everyone.

METHODE

This PKM activity was carried out between the UNIKAL PKM Team and 34 Posbindu cadres in the work area of the UPTD Puskesmas Pekalongan Selatan Pekalongan City. This community service activity involves a team of lecturers who are involved are 4 lecturers in accordance with their fields of expertise, 3 Puskesmas officers and 4 students who assist in the implementation of activities. With this method, it is hoped that the skills that have been given to partners can be continued and developed, even though the proposing team no longer provides assistance, the stages of implementation can be seen in the Figure 1.

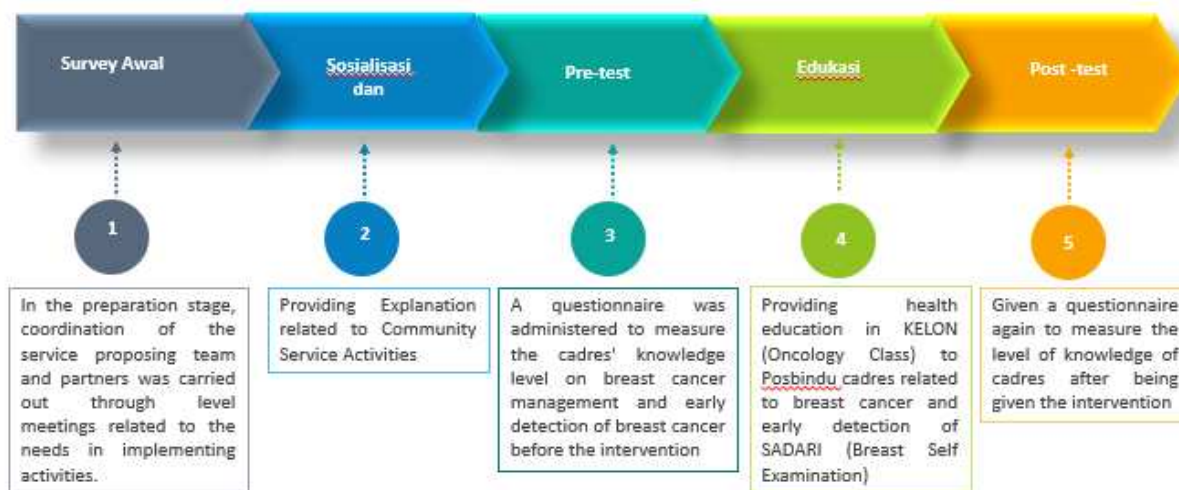


Fig 1. The stages in conducting community service program

As illustrated in Figure 1, this community service programme was conducted in five stages. First, the team conducted an initial survey of the conditions and needs of posbindu cadres and took care of licensing. Second, the team and students conducted socialisation of community service activities, both the background and the objectives and implementation. Third, a pretest was conducted to measure the level of knowledge of cadres before being given education. Fourth, cadres were given health education about breast cancer management, early detection of breast cancer with breast self-examination. Fifth, a post test was conducted to measure the level of knowledge of cadres after being given education.

RESULT AND DISCUSSION

Community service activities carried out in the form of providing education and interactive discussions on Empowering KELON (Oncology Class) in Screening and Early Detection of Breast Cancer in the South Pekalongan Puskesmas Working Area. The activity was carried out by servants from the Faculty of Health Sciences from the Ners Professional Study Program, Nursing Study Program, Public Health Study Program and D3 Physiotherapy Study Program of the Faculty of Health Sciences, Pekalongan University in collaboration with PKK Posbindu cadres at the South Pekalongan Puskesmas, Pekalongan City. This community service activity was carried out on 28 May 2024 at the South Pekalongan Health Centre which was attended by 36 Posbindu cadres. The series of Community Service Activities (PkM) are as follows:

1. Initial Survey

PkM activities began with an initial survey and permit processing on 3 May 2024. The documentation of activities is presented in Figure 2.



Fig 2. Initial survey and permit processing at South Pekalongan Health Centre, Pekalongan City

2. Socialisation

Socialisation was given to provide an overview of the implementation of community service activities.

3. Pretest

Before the education activity, a pretest was conducted to measure the knowledge of Posbindu cadres about Screening and Early Detection of Breast Cancer before the intervention. Activity documentation is presented in Figure 4.



Fig 4. Pretest

4. Education

Educational material on Breast Cancer was delivered by Mrs Isrofah, S.Kep., Ns., M.Kep and SADARI material was delivered by Mrs Dani Prastiwi, S.Kep., Ns., M.Sc. Documentation of the activity is presented in Figure 5.



Fig 5. Education on breast cancer and breast self-examination

5. Post Test

After the education activity, a pretest was conducted to measure the knowledge of Posbindu cadres about Screening and Early Detection of Breast Cancer after the intervention. After the pretest was completed, the entire series of activities ended and ended with a group photo of the service team, puskesmas officers, students and all participants (see Figure 6).



Fig 6. Documentation with pengabdian team, puskesmas team, posbindu cadres, students

The characteristics of respondents who participated in this activity are presented in Table 1 as follows. Based on table 1, it can be seen that the majority of respondents aged 41-50 years as many as 20 people (59%), all respondents are female as many as 34 people (100%), while from the characteristics of the last education most high school graduates as many as 16 people (47%) and the type of work most IRT as many as 28 people (82%).

Age affects a person's ability to comprehend and think. The older age, the more developed the power of capture and mindset, so that the knowledge obtained is getting better. knowledge obtained is getting better. At the productive or adult age (18-55 years), individuals will play a more active role in society and social life and make more preparations. play an active role in society and social life and make more preparations for the success of for the success of efforts to adjust to old age, besides that they will spend more time reading. spend more time reading. Intellectual ability, problem-solving, and verbal verbal abilities are reported to have almost no decline at this age. When viewed from the age of the respondents with an average age of over 40 years, they belong to the adult age group. In terms of public trust, someone who is more mature will be more more trusted than people in people who are not high enough maturity. This is as a result of of

experience and maturity of his soul. When viewed from the age of the cadres who are withering old, namely 59 years then the age is still in the productive category. However, with increasing age However, with increasing age, productivity decreases, this is because physical skills such as speed, flexibility, strength and coordination, will decrease speed, flexibility, strength and coordination, will decrease with age (Banowati, 2018). Based on the description above, it shows that the results of this study are in accordance with the opinion of Notoatmodjo, that age can affect the level of maturity of thinking, and withering age is productive or has perfect maturity. productive or have perfect maturity is when the respondent is less than 40 years old.

Table 1. Distribution of characteristics of Posbindu cadres (n=34)

Characteristics	Frequency (f)	Percentage (%)
Age		
a.. 30-40 years old	5	15
b. 41-50 years old	18	53
c. 51-60 years old	10	29
d. 61-70 years old	1	3
	34	100
Gender		
a.. Male	-	-
b. Female	34	100
	34	100
Education		
a. Primary School	2	6
b. Junior high school	15	44
c. Senior high school	16	47
d. Under graduate	1	3
	34	100
Type of work		
a. IRT	28	82
b. Wiraswasta	4	12
c. PNS	2	6
	34	100

The level of education affects a person's perception to be more receptive to new ideas and technology. Education is also one of the factors that influence a person's perception, because it can make a person easier to make decisions and act (Banowati, 2018). Based on the results showed that most of the respondents were not working, namely 35 respondents (64.8%), while those who worked were 19 respondents (35.2%). 35 respondents (64.8%), while those who worked were 19 respondents (35.2%). This This means that most of the health cadres are housewives so they spend a lot of time at home spend a lot of time at home. Most respondents did not work (64.8%) or were housewives. as housewives, this shows that most of the respondents' activities are at home in taking care of children and households. in taking care of children and households, respondents will have more time to take care of children and can caring for children and can participate in posyandu activities (Banowati, 2018).

All participants filled in the attendance list and pretest form containing 25 questions to measure the participants' knowledge about Screening Management and Early Detection of Breast Cancer. Based on Table 2, it can be seen that the level of knowledge of pretest respondents is 29 people (85.3%) in the poor category and after being given the intervention post test results 24 people (85%) in the very good category.

Table 2. Results of Pretest and Post Test (n=34)

Level of knowledge	Pretest		Post Test	
	Total (n)	Percentage (%)	Total (n)	Percentage (%)
Very good	-		24	85
Good	5	14,7	10	15
Less	29	85,3	-	-
Total	24	100	24	100

Knowledge is a person who is not absolutely influenced by education because knowledge can also be obtained from past experience, but the level of education also determines the ease with which a person absorbs and understands the information received which is then understood (Notoatmodjo in Albunsiyary, 2020). Knowledge or cognitive is a domain that is very important for the formation of one's actions (overt behavior). An educational program that aims to teach women how to perform breast self-examination for early detection of potential health problems, including breast cancer. Breast cancer is one of the most common cancers in women, and early detection plays an important role in improving prognosis and treatment effectiveness (Khana et al., 2022). It is consistent with Azlina's research from 2022, which explains how health cadres can conduct outreach and encourage women of childbearing age to actively participate in efforts to detect early breast and cervical cancer. Cadres who have taken exams and received health education are considered to have self-awareness (awareness) of cancer symptoms, causes, and early detection (Azlina et.al, 2022).

According to research conducted by Hiatt et al. (2018), a health promotion strategy is required to increase the achievements of the early cancer detection program through community empowerment activities, atmosphere building, advocacy, and cross-sector collaboration. Furthermore, it is necessary to pay attention to the percentage of health care carrying out health promotion, with sufficient staff and promotional materials, to improve program outcomes.

Therefore, knowledge is needed by cadres in efforts to screen and early detection of breast cancer. In an effort to improve the health status of women of childbearing age, the knowledge of posyandu cadres plays an important role in supporting the implementation of activities properly. The broader the knowledge of posyandu cadres, the probability of improving their performance in terms of early detection efforts and breast cancer screening will be better. Posyandu cadres are community members who are voluntarily willing, able and have the time to organise posyandu activities. Cadres play an important role starting from preparation, implementation, and after the implementation of activities. The role of cadres is needed to support the success of posyandu activities (Didah, 2020).

The main task of health workers is to promote health. Health promotion activities in the form of public outreach, particularly to women of reproductive age. Counseling conveys information through the media through lectures, demonstrations, and practices (Joseph et al., 2021). Every woman of reproductive age must be aware of the importance of early detection. Because cancer cells in the body can be identified and treated more quickly if there is a high level of awareness for early detection and symptoms knowledge (Azriful et al., 2021)

Early detection with SADARI is one way to detect breast cancer early. Undergoing BSE also makes you more vigilant, as it senses possible masses, retractions, swelling, or other abnormalities in your breasts (Dagne, Ayele & Assefa, 2019). In addition, BSE is a simple, safe, painless and non-invasive procedure to perform, requires no specialised equipment and is inexpensive, making it a test that can be performed by any woman.

Health cadre education through health counselling on breast self-examination has a significant influence on the ability in performing as well as teaching to others. This is also supported by with some research results that found that a person's self-efficacy in BSE is strongly influenced by the level of knowledge and skills (Dagne, Ayele & Assefa, 2019).

CONCLUSION

The Community Service activities that have been carried out received a positive response from the participants where the activities ran smoothly and the participants enthusiastically participated in all activities until completion. Characteristics of respondents The majority of respondents were 41-50 years old as many as 20 people (59%), all respondents were female as many as 34 people (100%), while from the characteristics of the last education the most high school graduates were 16 people (47%) and the type of work was mostly housewives as many as 28 people (82%). The level of knowledge of pretest respondents was 19 people (79.16%) in the poor category and after being given the intervention post test results 22 people (91.66%) in the very good category.

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REFERENCES

- Albunsiyary, A., Ôçi, M., & Riswati, F. (2020). PENGARUH PENGETAHUAN, PENGALAMAN KERJA, KOMPETENSI SDM DAN PENGEMBANGAN KARIER TERHADAP PRESTASI KERJA PERSONEL POLSEK PAMEKASAN. *MAP (Jurnal Manajemen Dan Administrasi Publik)*, 3(01), 19-37. <https://doi.org/10.37504/map.v3i01.228>
- Azlina, F. A., Setyowati, S., & Budiati, T. (2021). Female health education package enhances knowledge, attitudes, and self-efficacy of housewives in cervical cancer screening. *Enfermeria Clinica*, 31, S215-S219. 222AL-SIHAN: THE PUBLIC HEALTH SCIENCE JOURNAL VOLUME 14, NOMOR 2, JULY-DECEMBER 2022. <https://doi.org/10.1016/j.enfcli.2020.12.025>

- Azriful, A., Alam, S., & As Siddiq, M. (2022). Early Detection Program for Breast and Cervical Cancer in Indonesia: How is Implementation?. *Al-Sihah: The Public Health Science Journal*, 14(2), 211-224. <https://doi.org/10.24252/al-sihah.v14i2.33508>
- Banowati L.(2018). HUBUNGAN KARAKTERISTIK KADER DENGAN KEHADIRAN DALAM PENGELOLAAN POSYANDU. *Jurnal Kesehatan Stikes Cirebon*, 9 (2), 101-111. DOI: <https://doi.org/10.38165/jk.v9i2.85>
- Crosby, D., Bhatia, S. N., Brindle, K. M., Coussens, L. M., Dive, C., Emberton, M., Esener, S., Fitzgerald, R. C., Gambhir, S. S., Kuhn, P., Rebbeck, T. R., & Balasubramanian, S. (2022). Early detection of cancer. *Science*, 375. <https://doi.org/10.1126/science.aay9040>
- Dagne AH, Ayele AD, Assefa EM (2019) Assessment of breast self- examination practice and associated factors among female workers in Debre Tabor Town public health facilities, North West Ethiopia, 2018: Cross- sectional study. *PLoS ONE* 14(8): e0221356. <https://doi.org/10.1371/journal.pone.022135>
- Didah, D. (2020). Gambaran peran dan fungsi kader posyandu di wilayah kerja puskesmas Jatinangor. *JKM (Jurnal Kebidanan Malahayati)*, 6(2), 217-221. doi:<https://doi.org/10.33024/jkm.v6i2.2306>
- Donnelly, T. T., Al Khater, A. H., Al-Bader, S. B., Al Kuwari, M. G., Al-Meer, N., Malik, M., ... & Fung, T. (2013). Beliefs and attitudes about breast cancer and screening practices among Arab women living in Qatar: a cross-sectional study. *BMC women's health*, 13, 1-16. <http://www.biomedcentral.com/1472-6874/13/49>
- Giaquinto, A. N., Sung, H., Miller, K. D., Kramer, J. L., Newman, L. A., Minihan, A., Jemal, A., & Siegel, R. L. (2022). Breast Cancer Statistics, 2022. *CA: a cancer journal for clinicians*, 72(6), 524–541. <https://doi.org/10.3322/caac.21754>
- Henderson JT, Webber EM, Weyrich MS, Miller M, Melnikow J. Screening for Breast Cancer: Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*. 2024;331(22):1931–1946. doi:10.1001/jama.2023.25844.<https://jamanetwork.com/journals/jama/fullarticle/2818284>
- Hiatt, R. A., Sibley, A., Fejerman, L., Glantz, S., Nguyen, T., Pasick, R., ... & Ashworth, A. (2018). The San Francisco Cancer Initiative: a community effort to reduce the population burden of cancer. *Health Affairs*, 37(1), 54-61. <https://doi.org/10.1377/hlthaff.2017.1260>
- Houssami, N., Zackrisson, S., Blazek, K., Hunter, K., Bernardi, D., Lång, K., & Hofvind, S. (2021). Meta-analysis of prospective studies evaluating breast cancer detection and interval cancer rates for digital breast tomosynthesis versus mammography population screening. *European journal of cancer (Oxford, England : 1990)*, 148, 14–23. <https://doi.org/10.1016/j.ejca.2021.01.035>
- International Agency for Research on Cancer. (2021). Estimated agestandardized incidence rates (World) in 2020, all cancers, both sexes, all ages. Diakses pada 29 Juni 2024 dari <https://gco.iarc.fr/today/data/factsheets/populations/360-indonesia-factsheets.pdf>
- Joseph, G., Pasick, R. J., Schillinger, D., Luce, J., Guerra, C., & Cheng, J. K. Y. (2017). Information mismatch: cancer risk counseling with diverse underserved pa-tients. *Journal of genetic counseling*, 26(5), 1090-1104. <https://doi.org/10.1007/s10897-017-0089-4>
- Kadir, A., Dahniar, D., & Yun Diniaty Rosidi, I. . (2023). Breast Self Examination (BSE) Training for Early Detection of Breast Cancer in Women of Childbearing Age. *Abdimas Polsaka*, 2(2), 104–110. <https://doi.org/10.35816/abdimaspolsaka.v2i2.48>
- Kementerian Kesehatan Republik Indonesia. Profil Kesehatan Indonesia Tahun 2016. Jakarta: Kementerian Kesehatan RI; 2017.
- Khana, R., Rizky, U. F., Khoirunnisa, K., Wijonarko, P., Nainggolan, N., Rabima, R., & Astiani, R. (2022). Pelatihan dan Edukasi Penggunaan Aplikasi Breast Self Examination Sytem untuk Deteksi Dini terhadap Terjadinya Kanker Payudara di Puskesmas Tanjung Priok Pengalaman Peserta dalam Melakukan SADARI. *BERDIKARI*, 5(1).
- Khokher, S., Qureshi, W., Mahmood, S., Saleem, A., & Mahmud, S. (2011). Knowledge, attitude and preventive practices of women for breast cancer in the educational institutions of Lahore, Pakistan. *Asian Pacific journal of cancer prevention : APJCP*, 12(9), 2419–2424. DOI: <https://pubmed.ncbi.nlm.nih.gov/22296394/>
- Nur Asiah, Diah Arruum, Ellyta Aizar. (2019). Pengetahuan Wanita Tentang Kanker Payudara. *Jurnal Riset Hesti Medan*, 4 (1). <https://doi.org/10.34008/jurhesti.v4i1.82>
- Parambil, N. A., Philip, S., Tripathy, J. P., Philip, P. M., Duraisamy, K., & Balasubramanian, S. (2019). Community engaged breast cancer screening program in Kannur District, Kerala, India: A ray of hope for early diagnosis and treatment. *Indian Journal of Cancer*, 56(3), 222

- SEER Cancer Stat Facts: female breast cancer. National Cancer Institute. Published 2023. Accessed July 31, 2023. <https://seer.cancer.gov/statfacts/html/breast.html>
- Sihite, E. D. O., Nurchayati, S., & Hasneli, Y. (2019). GAMBARAN TINGKAT PENGETAHUAN TENTANG KANKER PAYUDARA DAN PERILAKU PERIKSA PAYUDARA SENDIRI (SADARI). *Jurnal Ners Indonesia*, 10(1), 8–20. <https://doi.org/10.31258/jni.10.1.8-20>
- Soekersi, H., Azhar, Y., & Akbari, K. S. (2022). Role Of Mammography In Breast Cancer Screening: A Literature Review. *Journal Of The Indonesian Medical Association*, 72(3), 144 - 150. <https://doi.org/10.47830/jinma-vol.72.3-2022-627>
- Trentham-Dietz, A., Chapman, C. H., Jayasekera, J., Lowry, K. P., Heckman-Stoddard, B. M., Hampton, J. M., ... & Mandelblatt, J. S. (2024). Collaborative modeling to compare different breast cancer screening strategies: a decision analysis for the US Preventive Services Task Force. *JAMA*. <https://jamanetwork.com/journals/jama/fullarticle/2818285>
- Wu, Z., Liu, Y., Li, X., Song, B., Ni, C., & Lin, F. (2019). Factors associated with breast cancer screening participation among women in mainland China: a systematic review. *BMJ open*, 9(8), e028705
- Yuhanah, Nuridah, & Yodang. (2019) “Pemberdayaan Kader Kesehatan Dalam Skrining dan Deteksi Dini Kanker Payudara Melalui Breast Self-Examination”, *Jurnal Penelitian dan Pengabdian Kepada Masyarakat UNSIQ*, 6(3), pp. 143-149. doi: <https://doi.org/10.32699/ppkm.v6i3.746>.
- Yuniastini, Y., Marhayuni, E., Wiratmoko, W., & Februase, E. (2022). Survival Life Penderita Kanker Payudara Berdasarkan Stadium Di Rumah Sakit Umum Daerah Dr. H. Abdul Moeloek Provinsi. *MAHESA : Malahayati Health Student Journal*, 2(2), 371-379. doi:<https://doi.org/10.33024/mahesa.v2i2.4557>



Enhancing physics experiment skills using smartphone sensors for teachers in sorong regency

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-10-26 Revised: 2025-03-02 Accepted: 2025-03-30 Published: 2025-04-14 Keywords Physics experiment Physics learning Phyphox app Smartphone sensor Teacher's skill	<i>This community service program designed to enhance physics experimental skills using smartphone sensors for high school teacher aims to introduce and train teachers in utilizing simple yet effective technology in physics education. By using smartphone sensors, the goal is to enable teachers to conduct experiments that are not only captivating but also easily accessible and relevant to daily life, thus boosting students' comprehension and interest. The program was conducted in two phases: first, a training session for teachers, followed by school visit with MGMP team to provide hands-on support, address any challenges teachers may encounter, and observe the implementation of the method. Furthermore, the effectiveness of the program was evaluated based on the results from both pre-assessment and post-assessment conducted on 20 teachers from MGMP group. The assessment results showed increases in understanding and preparing technology, collecting data, and analyzing and evaluating data. Despite several challenges such as limited access to compatible devices and varying levels of understanding regarding the concept, the training was overall successfully improved teachers' skills in applying the technology for physics experiment.</i>
Kata Kunci Eksperimen Fisika Pembelajaran Fisika Aplikasi Phyphox Sensor Smartphone Ketrampilan guru	Peningkatan Keterampilan Eksperimen Fisika menggunakan Sensor Smartphone bagi Guru di Kabupaten Sorong. Program pengabdian masyarakat yang dirancang untuk meningkatkan keterampilan eksperimen fisika menggunakan sensor smartphone bagi guru SMA ini bertujuan untuk memperkenalkan dan melatih guru dalam memanfaatkan teknologi sederhana namun efektif dalam pendidikan fisika. Dengan menggunakan sensor smartphone, guru diharapkan dapat melakukan eksperimen yang tidak hanya menarik tetapi juga mudah diakses dan relevan dengan kehidupan sehari-hari sehingga meningkatkan pemahaman dan minat siswa. Program ini dilaksanakan dalam dua tahap: pertama, sesi pelatihan bagi guru, dilanjutkan dengan kunjungan sekolah bersama tim MGMP untuk memberikan dukungan langsung, mengatasi tantangan yang mungkin dihadapi guru, dan mengamati penerapan metode tersebut. Selanjutnya efektivitas program dievaluasi berdasarkan hasil pre-assessment dan post-assessment yang dilakukan pada 20 orang guru kelompok MGMP. Hasil penilaian menunjukkan peningkatan dalam aspek ketrampilan memahami dan menyiapkan teknologi, aspek ketrampilan mengumpulkan data, dan aspek ketrampilan menganalisis dan mengevaluasi data. Meskipun terdapat beberapa tantangan seperti terbatasnya akses terhadap perangkat yang kompatibel dan tingkat pemahaman konsep yang berbeda-beda, pelatihan ini secara keseluruhan berhasil meningkatkan keterampilan guru dalam menerapkan teknologi untuk eksperimen fisika.

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INTRODUCTION

The improvement of human resources to compete in the era of globalization is greatly influenced by education, with physics education playing a vital role in enhancing analytical skills, problem solving abilities, and understanding of scientific concepts (Astari et al., 2024; Puspa et al., 2023; Walidin, 2016; Alfayani et al., 2024; Himawan et al., 2020; Sugianto et al., 2020). However, physics education encounters several challenges, including the perception that it is a difficult subject leading to rote memorization by students (Haerunnisa et al., 2022; Rabiudin et al., 2022). The challenge is clear from the significant amount of students struggling to comprehend physics material and formulas (Ady & Warliani, 2022; Azizah et al., 2015; Daun et al., 2020). The effective way to study physics requires direct observations or experiments to ensure students truly understand the concepts (Nova & Lestari, 2021; Sahrudin et al., 2019; Sarjono, 2018).

Musyawarah Guru Mata Pelajaran (MGMP) Fisika has been active in Sorong Regency since 2008 and it serves as a platform for physics teachers to exchange knowledge and experiences with the aim of enhancing the quality of physics education. Comprising 29 teachers from 18 high schools in Sorong Regency, the group is supported by the local educational authorities. One of the challenges faced by this group is the limited availability of physics experiment equipment at school laboratories. Additionally, there is a need for significant funding for the development of laboratory facilities which detain the effectiveness of interactive learning and leads to a lack of direct experimental lessons for students.

In response to these issues, one potential resolution involves harnessing the sensor technology present in smartphones for conducting physics experiments. With the prevalent use of smartphones in both urban and remote areas, it has become an integral part of the digital age. In Indonesia, the number of smartphone users has seen significant growth, with an estimated 177 million active users in 2021 and a continued increase due to technological advancements and wider digital access (Rochmahwati, 2023). Smartphone penetration has also increased, with a 25.9% growth from 2019 to 2023 (Indriyani & Supriyadi, 2023). Additionally, a 2018 UNICEF study indicated that 98% of children and adolescents in Indonesia are familiar with the internet, with 79.5% accessing it through smartphones (Ikhwan et al., 2022). This provides an excellent opportunity to leverage existing technology as a more affordable and accessible tool for physics experiments.

The use of these sensors is expected not only to provide a more economical alternative but also to enhance the quality of learning by involving students more interactively (Countryman, 2014; Monteiro et al., 2015; Raharja & Ishafit, 2021; Vogt & Kuhn, 2012). One of the applications that can be used is phyphox, which allows smartphones to function as measurement tools in various physics experiments. This application has been utilized in experiments such as free fall motion, magnetic fields, the Doppler effect, sound waves, circular motion, cylindrical motion, and collisions (Ariyansah et al., 2021; Gianino, 2021; Hikmatiar, 2019; Islamiah et al., 2023; Nurfadilah et al., 2019; Putri et al., 2022; Walid, 2022; Westermann et al., 2022; Yani et al., 2023; Yasaroh et al., 2021). The results produced by the phyphox application have been used as references for data analysis in physics experiments to measure physical quantities (Carroll & Lincoln, 2020; Mayampoh et al., 2021; Staacks et al., 2022).

Considering the challenges and potential benefits, teachers need intensive training to effectively use this technology. The Physics Experiment Assistance Program Using Smartphone Sensor Technology for High School Teachers in Sorong Regency is a strategic initiative to address this issue. The goal of this community service is to improve teacher's technical abilities in conducting smartphone-based experiments, leading to a more interactive, innovative, and technology-focused approach to teaching physics. Furthermore, the program aligns with SDG4, Quality Education, by providing affordable smartphone-based experiment tools to overcome limitations in laboratory facilities and expand the access to quality education for all students. Additionally, the program aims to enhance teacher's skills, ultimately improving the overall quality of education in schools.

METHOD

This community service is an application of the results of research into the development of smartphone sensor modules and analysis of their use in traveling carnival (Raharja, Irianti, Lestari, & Kabes, 2024; Raharja, Irianti, Lestari, Londong, et al., 2024). The flowchart as Figure 1, illustrates the sequential steps of the program.

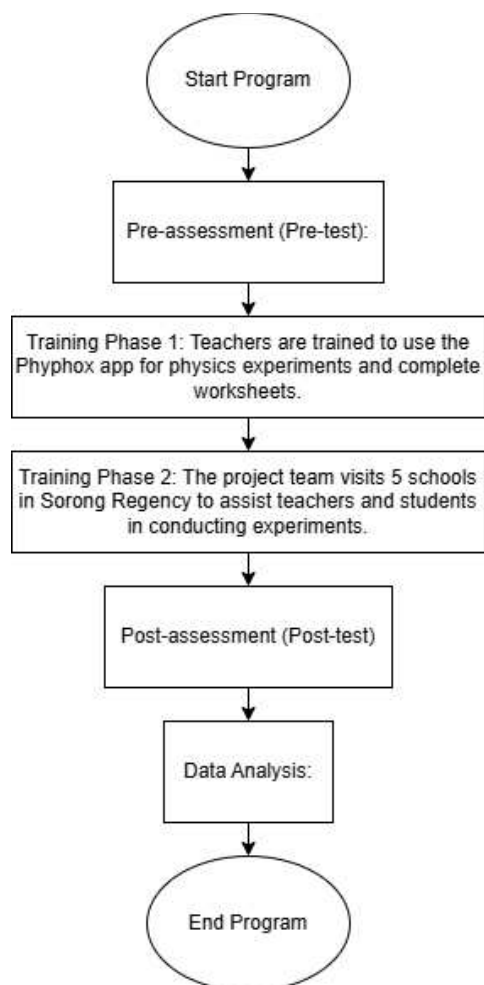


Fig 1. The steps of the program

The flowchart illustrates the structured approach of the training program, which was conducted in two phases to ensure effective implementation and evaluation. In the first phase, teachers from the MGMP Group were trained on how to perform physics experiments, such as free fall motion, circular motion, pendulum, and collision, using the Phyphox application. Throughout this phase, teachers were also required to complete worksheets to reinforce their understanding and practical skills. This initial training aimed to equip teachers with the necessary knowledge and confidence to integrate smartphone sensor technology into their teaching practices. Following this, the second phase involved the project team, consisting of 3 lecturers and 5 students from the Science Education Department, visiting five schools in Sorong Regency. These schools included SMA Negeri 1 Kabupaten Sorong, SMA Negeri 5 Kabupaten Sorong, MAN Insan Cendekia Kabupaten Sorong, SMA Negeri 2 Kabupaten Sorong, and SMK Modeling Salawati. During these visits, the team assisted teachers in conducting experiments with their students, ensuring that the knowledge gained during the training was effectively applied in real classroom settings.

To evaluate the program's efficacy, pre-assessment and post-assessment were conducted for the 20 MGMP Group teachers. The pre-test and post-test consisted of 10 identical questions focusing understanding and preparing technology, collecting experimental data, and analyzing and evaluating data. The pre-assessment was administered before the training began, while the post-assessment was conducted after the training and school visits. Responses were scored using a 5-point Likert Scale, ranging from (1) Strongly Disagree to (5) Strongly Agree. This scoring system allowed for a quantitative analysis of the teachers' progress and the program's overall impact.

RESULTS AND DISCUSSION

Training Activities

The training activity took place at SMA N 2 located in Aimas District, Sorong Regency Southwest Papua. A total of 20 physics teachers, 2 lecturers and 5 students of Science Education Department participated in the training. The activity was conducted in two main sessions, with the first session involving a material presentation then followed by a simulation.

In simulation session, teachers are divided into four groups where each group takes turn conducting experiment free fall motion, circular motion, pendulum and collision. The training activities are shown in Figure 2.



Fig 2. (a) presentation regarding Phyphox by lecturer, (b) free fall motion using Phyphox

School Visit

The project team paid a visit to multiple schools in Sorong Regency to assist teachers and students in conducting physics experiments using sensors based on smartphones. This visit was part of the follow-up stage of the training, where teachers had previously been trained to use the Phyphox application for collecting and analyzing physics data. The process of assistance began with a brief introduction from the team about the steps of the experiment. Teachers, who had received prior training, then guided the students through conducting the experiments, while the team provided technical assistance and ensured that everything proceeded smoothly. Each student utilized their smartphones to measure various physics data, such as acceleration and speed using the sensors in their devices with the support of the Phyphox app.

During the activity, the students actively participated in conducting the experiments, collecting and analyzing data in an interactive manner. Teachers played a facilitative role, guiding students to comprehend the underlying physics concepts of the experiments. Additionally, the training team assisted in interpreting the results and offering real-world applications for the collected data. This visit not only enabled teachers to apply the skills acquired during training but also exposed students to innovative learning approaches. By utilizing smartphone sensor technology, experiments that typically require complex laboratory equipment could be conducted more easily and affordably without compromising the quality of the learning experience. Following the activity, the team and teachers collaboratively evaluated the experiments to recognize successes and areas needing improvement. The project team visited SMA Negeri 1 Sorong Regency, MAN Insan Cendekia Sorong Regency, and SMA Negeri 5 Sorong Regency to support the implementation of physics experiments using the Phyphox application, as shown in Figures 3, 4, and 5.



Fig 3. Project team paid a visit to SMA N 1 Sorong Regency



Fig 4. Project team paid a visit to MAN Insan Cendekia Sorong Regency



Fig 5. Project team paid a visit to SMA N 5 Sorong Regency

Evaluation

The assessment scores used for evaluating this training were obtained from pre-assessment and post-assessment score. An initial assessment was performed before the training to measure the teachers' comprehension and proficiency in conducting physics experiments, particularly in utilizing the Phyphox application. Following the completion of the training, a second assessment was carried out to assess the enhancement in teachers' skills. The assessment results were categorized into two parts: an overall evaluation of teachers' skills and an evaluation based on three different aspects i.e., understanding and preparing technology, collecting experimental data, and analyzing and evaluating data. The results of pre-assessment and post-assessment score are shown Figure 6.

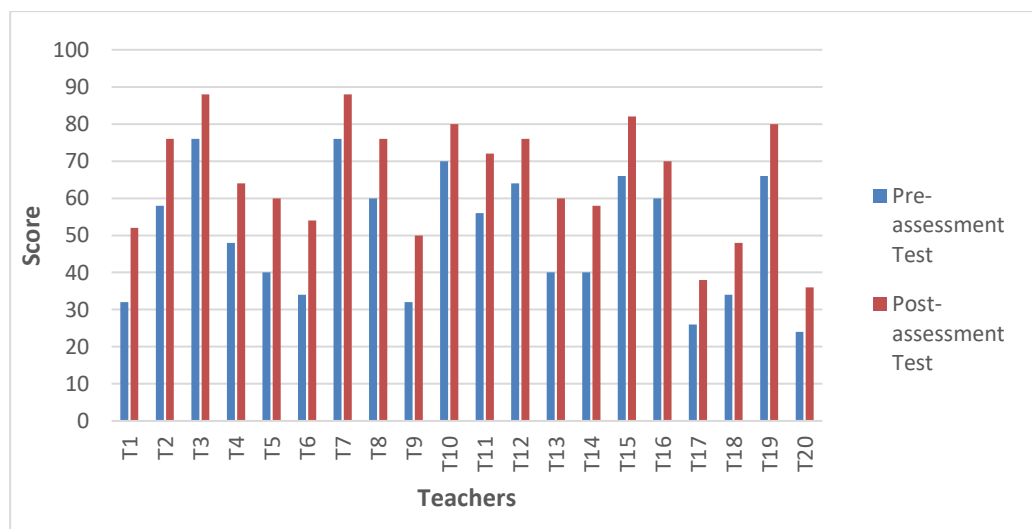


Fig 6. Pre-assessment and post-assessment score of teachers in conducting physics experiment by using Phyphox

In Figure 6, it can be seen that prior to the training, teachers' average score in conducting physics experiments with the Phyphox application was 48.7, suggesting that most teachers had a basic to intermediate skill level. Some teachers had a better understanding before the training, as indicated by the highest pre-assessment score of 76. On the other hand, the lowest score of 24 showed that some teachers encountered significant difficulties in mastering physics experiments before the training commenced. Following the training, there was a rise in the average score to 66.4, which indicates an enhancement in the proficiency of teachers in utilizing the Phyphox application, particularly in the areas of data collection and experiment analysis. The top score following the training stood at 88, underscoring substantial progress among teachers who already possessed strong skills. The lowest post-assessment score increased to 36, although some teachers still encountered difficulties. Moreover, the average improvement for all teachers amounted to 17.7 points, highlighting the effectiveness of the training. The greatest advancement was 26 points (e.g., T1: 32 to 52), while the smallest improvement was 12 points (e.g., T17: 26 to 38), affirming that all teachers made strides. Based on the analysis, the results can be broken down into several indicators shown in Figure 7.

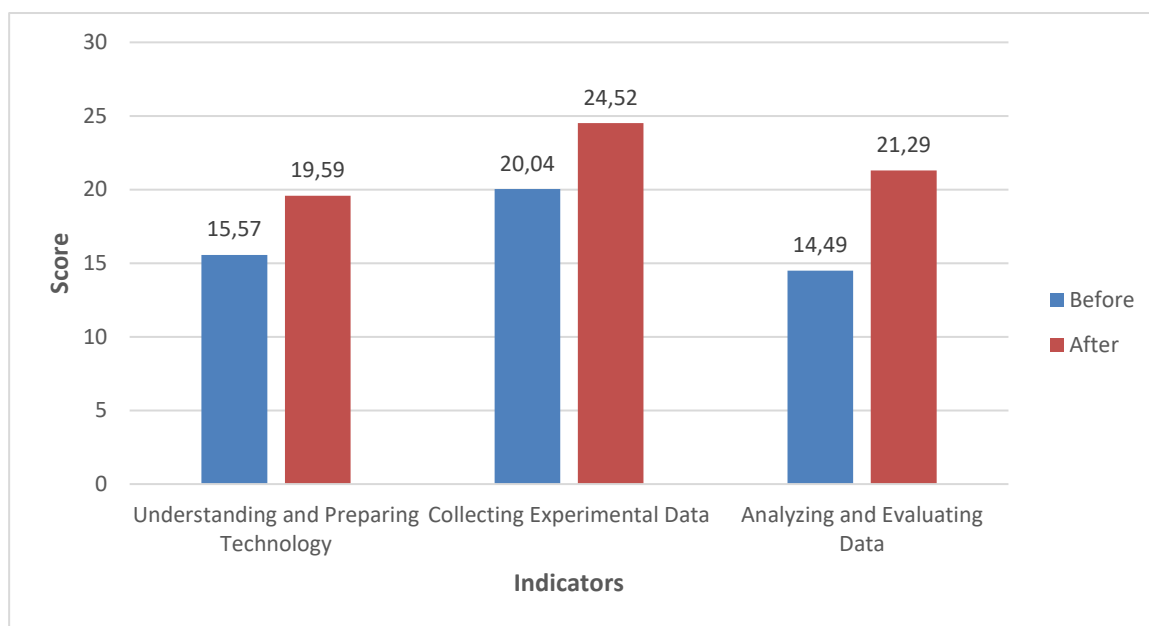


Fig 7. Assessment score are evaluated based on three aspects

In Understanding and Preparing Technology, the average score increased from 15.57 to 19.59, indicating that teachers developed a stronger grasp of the Phyphox application and its integration into physics experiments. For Collecting Experimental Data, the average score rose from 20.04 to 24.52, reflecting improved skills in accurately gathering and managing data during experiments. Lastly, in Analyzing and Evaluating Data, the average score improved from 14.49 to 21.29, demonstrating significant progress in teachers' ability to interpret, analyze, and draw conclusions from experimental results. These improvements across all indicators highlight the effectiveness of the training program in enhancing teachers' competencies in utilizing smartphone sensor technology for physics education.

Further analysis is essential to determine the significance of the program's performance before and after the training. The success rates for each indicator reveal notable improvements: Understanding and Preparing Technology saw a 25.8% increase (from 15.57 to 19.59), indicating enhanced teacher readiness in using the Phyphox application. Collecting Experimental Data improved by 22.4% (from 20.04 to 24.52), reflecting better skills in gathering and managing data. The most significant progress was in Analyzing and Evaluating Data, with a 46.9% increase (from 14.49 to 21.29), demonstrating a substantial boost in teachers' ability to interpret and evaluate experimental results. These percentages highlight the program's effectiveness in improving teacher competencies across all aspects, with the most remarkable impact on critical thinking and data analysis skills. Further statistical analysis could validate the significance of these improvements.

CONCLUSION

The program designed to enhance physics experimental skills using smartphone sensors for high school teacher aims to introduce and train teachers in utilizing simple yet effective technology in physics education. By using smartphone sensors, the goal is to enable teachers to conduct experiments that are not only captivating but also easily accessible and relevant to daily life, thus boosting students' comprehension and interest. Another benefit of this approach is that students get to work with real-time data during their learning experiences. The program was conducted in two phases:

first, a training session for teachers, followed by school visit with MGMP team to provide hands-on support, address any challenges teachers may encounter, and observe the implementation of the method. The assessment results indicate an improvement in teachers' abilities concerning the understanding and application of technology, data collection and data analysis and evaluation. Before the training, the average score of teachers in conducting physics experiments using the Phyphox application was 24.75, indicating a basic to intermediate skill level, with some teachers struggling and others performing better. After the training, the average score rose to 34.55, with improvements particularly in data collection and experiment analysis. The highest post-training score reached 44, and the lowest was 18, indicating overall progress. Teachers' average improvement was 9.8 points, demonstrating the training's effectiveness. Skills assessment showed increases of 2.01 points in understanding and preparing technology, 2.24 points in collecting data, and 3.4 points in analyzing and evaluating data, highlighting comprehensive gains in experimental proficiency. Throughout the program, there were several challenges including limited experience in effectively utilizing the technology, restricted access to compatible devices, and varying levels of understanding regarding the concept. One of the follow-up strategies is to develop comprehensive guidelines and supporting materials that outline step-by-step instructions.

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REFERENCES

- Ady, W. N., & Warliani, R. (2022). Analisis Kesulitan Belajar Siswa SMA terhadap Mata Pelajaran Fisika pada Materi Gerak Lurus Beraturan. *Jurnal Pendidikan Dan Ilmu Fisika*, 2(1), 104. <https://doi.org/10.52434/jpif.v2i1.1599>
- Alfayani, C., Suana, W., & Viyanti, V. (2024). Pengaruh Pembelajaran Blended Learning Menggunakan Tracker pada Materi Gerak Harmonis Sederhana Berbasis Inkuiri Terbimbing Terhadap Peningkatan Kemampuan Berpikir Kreatif Siswa. *JIPFRI (Jurnal Inovasi Pendidikan Fisika Dan Riset Ilmiah)*, 8(1), 29–38. <https://doi.org/10.30599/jipfri.v8i1.3315>
- Ariyansah, D., Hakim, L., & Sulistyowati, R. (2021). Pengembangan e-LKPD Praktikum Fisika Pada Materi Gerak Harmonik Sederhana Berbantuan Aplikasi Phyphox Untuk Meningkatkan Pemahaman Konsep Peserta Didik. *Jurnal Penelitian Pembelajaran Fisika*, 12(2), 173–181. <https://doi.org/10.26877/jp2f.v12i2.9052>
- Astari, I. Y., Kristanti, B. A., & Paradita, B. (2024). Sumber Daya Manusia Indonesia Yang Berdaya Saing di Era Global. In *Paradita* (Vol. 1, Issue 2). <https://www.journal.muc-consultindo.com/index.php/jebizko>
- Azizah, R., Yulianti, L., & Latifah, E. (2015). Kesulitan Pemecahan Masalah Fisika Pada Siswa Sma The Physic Problem Solving Difficulties On High School Student. *Jurnal Penelitian Fisika Dan Aplikasinya (JPFA)*, 5(2). <http://journal.unesa.ac.id/index.php/jpfa>
- Carroll, R., & Lincoln, J. (2020). Phyphox app in the physics classroom. *The Physics Teacher*, 58(8), 606–607. <https://doi.org/10.1119/10.0002393>
- Countryman, C. L. (2014). Familiarizing Students with the Basics of a Smartphone's Internal Sensors. *The Physics Teacher*, 52(9), 557–559. <https://doi.org/10.1119/1.4902204>
- Daun, N. S., Helmi, H., & Haris, A. (2020). Diagnosis Kesulitan Belajar Fisika Peserta Didik di SMA Negeri 1 Bontomarannu. *Prosiding Seminar Nasional Fisika PPs UNM*, 2, 37–40.
- Gianino, C. (2021). Uniform circular motion measurements employing a smartphone using the phyphox app and a turntable. *Physics Education*, 56(1). <https://doi.org/10.1088/1361-6552/abc9d4>
- Haerunnisa, H., Prasetyaningsih, P., & Biru, L. T. (2022). Analisis Miskonsepsi Siswa SMP pada Konsep Getaran dan Gelombang. *PENDIPA Journal of Science Education*, 6(2), 428–433. <https://doi.org/10.33369/pendipa.6.2.428-433>
- Hikmatiar, H. (2019). Determination the coefficient of restitution in object as temperature function in partially elastic collision using phyphox application on smartphone. *Science and Technology Indonesia*, 4(4), 88–93. <https://doi.org/10.26554/sti.2019.4.4.88-93>
- Himawan, N. A., Jumadi, J., & Purwanto, E. (2020). Identifikasi Kemampuan Penalaran Siswa Kelas XI di MAN 4 Bantul Pada Suhu Dan Kalor. *EDUSAINS*, 12(1), 30–37. <https://doi.org/10.15408/es.v12i1.12784>
- Ikhwan, Y., Muflih, H., Ridho, I. I., & Rahman, F. (2022). Pelatihan Pembuatan Kuis Dan Game Edukatif Berbasis Teknologi Informasi di SDIT Anak Sholeh Mandiri Banjarmasin. *Community Development Journal: Jurnal Pengabdian Masyarakat*, 3(3), 1588–1591. <https://doi.org/10.31004/cdj.v3i3.6974>

- Indriyani, R., & Supriyadi, S. (2023). Gejala Perilaku Alexithymia dan Gejala Kecemasan Sosial Dengan Kecanduan Pengguna Smartphone Pada Mahasiswa Keperawatan S1. *Jurnal Perawat Indonesia*, 7(3), 1596–1603. <https://doi.org/10.32584/jpi.v7i3.2359>
- Islamiah, M., Rostati, R., & Neneng Triyunita. (2023). Pengembangan Alat Praktikum Gerak Jatuh Bebas Menggunakan Phyphox Berbasis Smartphone untuk Siswa Kelas X. *JURNAL PENDIDIKAN MIPA*, 13(3), 887–892. <https://doi.org/10.37630/jpm.v13i3.1203>
- Mayampoh, L. B., Tulandi, D. A., Rende, J., Poluakan, C., & Komansilan, A. (2021). Phyphox application with PIMCA learning model. *Journal of Physics: Conference Series*, 1968(1). <https://doi.org/10.1088/1742-6596/1968/1/012042>
- Monteiro, M., Stari, C., Cabeza, C., & Marti, A. C. (2015). The Atwood machine revisited using smartphones. *The Physics Teacher*, 53(6), 373–374. <https://doi.org/10.1119/1.4928357>
- Nova, D. A. O., & Lestari, N. A. (2021). Analisis Persepsi Siswa Terhadap Pembelajaran Fisika Berbasis Ecopedagogy Dengan Metode Daring Selama Pandemi Covid-19. 7(1).
- Nurfadilah, N., Ishafit, I., Herawati, R., & Nurulia, E. (2019). Pengembangan Panduan Eksperimen Fisika Menggunakan Smartphone dengan Aplikasi Phyphox Pada Materi Tumbukan. *Jurnal Penelitian Pembelajaran Fisika*, 10(2), 101–107. <https://doi.org/10.26877/jp2f.v10i2.4019>
- Puspa, C. I. S., Rahayu, D. N. O., & Parhan, M. (2023). Transformasi Pendidikan Abad 21 dalam Merealisasikan Sumber Daya Manusia Unggul Menuju Indonesia Emas 2045. *Jurnal Basicedu*, 7(5), 3309–3321. <https://doi.org/10.31004/basicedu.v7i5.5030>
- Putri, W. A. S., Hakim, L., & Sulistyowati, R. (2022). Pengembangan E-Lkpd Materi Efek Doppler Berbasis Inkuiri Terbimbing Berbantuan Aplikasi Phyphox Untuk Meningkatkan Pemahaman Konsep Fisika. *ORBITA: Jurnal Pendidikan Dan Ilmu Fisika*, 8(1), 15. <https://doi.org/10.31764/orbita.v8i1.6828>
- Rabiudin, R., Rusdin, R., & Maimuna, W. (2022). Telaah Kognitif: Pemetaan Kemampuan Mengingat Siswa Dalam Pembelajaran Fisika Dan Matematika. *Jambura Physics Journal*, 4(1), 1–13. <https://doi.org/10.34312/jpj.v4i1.13603>
- Raharja, E. P., Irianti, M., Lestari, R. D., & Kabes, Y. (2024). Development of a physics experiment module based on smartphone sensors on mechanics for high school students. *Jurnal Riset Dan Kajian Pendidikan Fisika*, 11(1), 1–10. <https://doi.org/10.12928/jrpkpf.v11i1.634>
- Raharja, E. P., Irianti, M., Lestari, R. D., Londong, C. M., & Mudumi, S. (2024). Analyzing Physics Experiment using Sensor Smartphone in Traveling Carnival. *Jurnal Penelitian Pendidikan IPA*, 10(3), 1247–1254. <https://doi.org/10.29303/jppipa.v10i3.6792>
- Raharja, E. P., & Ishafit. (2021). Development of circular motion experiment tool using sensor smartphone for high school students. *Journal of Physics: Conference Series*, 1806(1), 012048. <https://doi.org/10.1088/1742-6596/1806/1/012048>
- Rochmahwati, M. R. (2023). Analisis Pengaruh Teknologi Digital Terhadap Pertumbuhan Ekonomi di Pulau Jawa. *Jurnal Ilmu Ekonomi JIE*, 7(03), 369–380. <https://doi.org/10.22219/jie.v7i03.27050>
- Sahrudin, S., Wahyudi, W., & Hikmawati, H. (2019). Pengaruh Model Pembelajaran Inkuiri Dengan Metode Eksperimen Terhadap Hasil Belajar Fisika Siswa SMAN 1 Gunungsari Tahun Ajaran 2016/2017. *Jurnal Pendidikan Fisika Dan Teknologi*, 5(2), 335–340. <https://doi.org/10.29303/jpft.v5i2.1171>
- Sarjono. (2018). Pentingnya Laboratorium Fisika dalam Menunjang Pembelajaran Fisika. *Jurnal Madaniyah*, 8(2), 262–271.
- Staacks, S., Dorsel, D., Hütz, S., Stallmach, F., Splith, T., Heinke, H., & Stampfer, C. (2022). Collaborative smartphone experiments for large audiences with phyphox. *European Journal of Physics*, 43(5), 055702. <https://doi.org/10.1088/1361-6404/ac7830>
- Sugianto, R., Permana P, N. D., & Diniya, D. (2020). Meta-Analysis: Enhancing Junior High School Students' Higher Order Thinking Skills Through Problem Solving Learning Model In Natural Sciences-Physics. *Jurnal Geliga Sains: Jurnal Pendidikan Fisika*, 8(1), 55. <https://doi.org/10.31258/jgs.8.1.55-63>
- Vogt, P., & Kuhn, J. (2012). Analyzing free fall with a smartphone acceleration sensor. *The Physics Teacher*, 50(3), 182–183. <https://doi.org/10.1119/1.3685123>
- Walid, I. H. B. I. (2022). Development of a Free Fall Motion Experiment based on Smart Phone using Phyphox application. *Journal of Physics: Conference Series*, 2309(1). <https://doi.org/10.1088/1742-6596/2309/1/012085>
- Walidin, W. (2016). Arah Pengembangan Sumberdaya Manusia Dalam Dimensi Pendidikan Islam. *JURNAL EDUKASI: Jurnal Bimbingan Konseling*, 2(2), 147. <https://doi.org/10.22373/je.v2i2.813>
- Westermann, N., Staacks, S., Heinke, H., & Möhrke, P. (2022). Measuring the magnetic field of a low frequency LC-circuit with phyphox. *Physics Education*, 57(6). <https://doi.org/10.1088/1361-6552/ac920e>

- Yani, R. F., Arini, W., & Yolanda, Y. (2023). Pengembangan E-Modul Gelombang Bunyi Berbantuan Aplikasi Phyphox Untuk Meningkatkan Kemandirian Dan Hasil Belajar Siswa Kelas Xi Ipa Man 2 Lubuklinggau. *Jurnal Perspektif Pendidikan*, 17(1), 80–88. <https://doi.org/10.31540/jpp.v17i1.2216>
- Yasaroh, S., Kuswanto, H., Ramadhanti, D., Azalia, A., & Hestiana, H. (2021). Utilization of the phyphox application (physical phone experiment) to calculate the moment of inertia of hollow cylinders. *Jurnal Ilmiah Pendidikan Fisika Al-Biruni*, 10(2), 231–240. <https://doi.org/10.24042/jipfalbiruni.v10i2.9237>



Training and mentoring of Posyandu cadres based on behavior change in an effort to prevent stunting in Mulyoagung village, Dau sub-district, Malang district

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ARTICLE INFO	ABSTRACT
Article history Received: 2025-01-07 Revised: 2025-04-06 Accepted: 2025-04-16 Published: 2025-04-20 Keywords Behavior change Child stunting Posyandu cadres	<i>Stunting remains a major public health issue in Indonesia, with a prevalence of 37% in 2013 and 30.8% in 2018, affecting approximately 8.4 million children under five. This condition is not limited to children from poor families but also affects those from well-off households. The causes of stunting are multidimensional, involving not only nutritional deficiencies in pregnant women and toddlers but also high-risk behaviors related to parenting and health practices. This community service program aimed to enhance the capacity of posyandu (integrated health post) cadres in stunting prevention through a behavior change approach. The methods applied included counseling, training, and mentoring for cadres in Mulyoagung Village, Dau Sub-district, Malang District. The outcomes demonstrated a significant improvement in the cadres' understanding of stunting, its causes, and impacts. Participants also gained insights into the importance of behavior change education in preventing stunting. Feedback indicated increased mastery of practical prevention strategies, and cadres were able to apply and disseminate the training materials in their community in an integrated and sustainable manner. In conclusion, training and mentoring based on behavior change effectively empowered posyandu cadres in stunting prevention efforts.</i>
Kata Kunci Kader posyandu Perubahan perilaku Stunting pada balita	Pelatihan dan pendampingan kader posyandu berbasis perubahan perilaku dalam upaya pencegahan stunting di Desa Mulyoagung Kecamatan Dau Kabupaten Malang. Stunting merupakan salah satu masalah gizi kronis yang masih menjadi tantangan besar di Indonesia. Data menunjukkan prevalensi balita stunting sebesar 37% pada tahun 2013 dan menurun menjadi 30,8% pada tahun 2018, namun jumlah tersebut tetap tergolong tinggi dengan sekitar 8,4 juta anak balita terdampak. Stunting tidak hanya terjadi pada keluarga miskin, tetapi juga pada keluarga sejahtera. Faktor penyebab stunting bersifat multidimensional, tidak hanya terbatas pada kurangnya asupan gizi ibu hamil dan balita, namun juga dipengaruhi oleh perilaku berisiko yang berkaitan dengan pola asuh dan kesehatan. Tujuan dari kegiatan ini adalah meningkatkan kapasitas kader posyandu dalam mencegah stunting berbasis perubahan perilaku. Metode yang digunakan meliputi penyuluhan, pelatihan, dan pendampingan kepada kader posyandu di Desa Mulyoagung, Kecamatan Dau, Kabupaten Malang. Hasil kegiatan menunjukkan bahwa kader posyandu mengalami peningkatan pemahaman mengenai stunting, penyebab, dan dampaknya. Kader juga memahami pentingnya edukasi perubahan perilaku dalam pencegahan stunting. Umpan balik dari peserta menunjukkan peningkatan penguasaan materi serta kemampuan dalam menerapkan informasi secara praktis dan berkelanjutan di posyandu desa. Kesimpulannya, pelatihan dan pendampingan berbasis perubahan perilaku efektif dalam meningkatkan peran kader posyandu dalam pencegahan stunting.

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INTRODUCTION

Stunting, defined as the failure to thrive in children under five years old due to chronic malnutrition, remains a significant public health challenge globally. In Indonesia, stunting is a major concern, with the prevalence of stunted children under five reaching 30.8% in 2018, a decrease from 37% in 2013 (Putri et al., 2024). Stunting, which becomes visible when children reach two years of age, affects not only physical growth but also cognitive and motor development, impairing overall child development and increasing vulnerability to diseases (Zakiyya et al., 2021). Stunting results from a combination of prenatal, intranatal, and postnatal factors, including poor maternal nutrition, inadequate breastfeeding, frequent infections, and socio-economic conditions (Chabibah et al., 2021).

The Indonesian government has recognized the urgency of addressing this issue, setting a target to reduce stunting prevalence to 14% by 2024 through comprehensive strategies (Suharsih & Rahayu, 2023). Despite these efforts, current interventions have primarily focused on improving nutrition intake, particularly during pregnancy and infancy, but behavior-based prevention strategies have yet to be fully integrated into these initiatives. In this context, Posyandu (Integrated Service Posts), a community-based health initiative, play a critical role in monitoring child health, detecting early signs of stunting, and providing educational support to parents and caregivers (Widawati et al., 2023). However, Posyandu cadres, who are essential in delivering these services, often lack sufficient training in behavior change strategies specifically targeting stunting prevention (Rahendra & Dwihestie, 2023).

Existing research and government programs have primarily concentrated on addressing the nutritional aspects of stunting. For example, government programs focus on fulfilling the nutritional needs of pregnant women and young children, such as providing supplements and promoting exclusive breastfeeding (Givani, 2022). However, the influence of behavior patterns, such as parental practices, community engagement, and the adoption of healthy lifestyles, has received limited attention. Studies have shown that behavioral factors, including inadequate knowledge, poor hygiene practices, and cultural taboos, significantly contribute to the persistence of stunting (Rambe, 2022). There is a pressing need for interventions that not only focus on nutrition but also emphasize behavior change to address the underlying causes of stunting more comprehensively.

This paper aims to fill this gap by exploring the potential of behavior change-based training and mentoring for Posyandu cadres in Mulyoagung Village, Dau Sub-district, Malang Regency, Indonesia. The primary objective is to enhance the knowledge and skills of Posyandu cadres in stunting prevention through a behavior change framework. Specifically, the paper seeks to: (1) Increase awareness of stunting, its causes, and the importance of behavior change in preventing stunting among Posyandu cadres. (2) Equip Posyandu cadres with practical tools to promote healthy behaviors within their communities. (3) Foster a sustainable model for stunting prevention based on the active engagement of local health stakeholders and the broader community.

This study contributes to the literature on stunting prevention by integrating behavior change theories into health promotion practices at the community level. It highlights the importance of empowering community health workers, specifically Posyandu cadres, to adopt and advocate for behavior change strategies that prevent stunting. Additionally, this research provides a practical framework for implementing behavior change-based interventions in local health initiatives, which could be replicated in other regions facing similar challenges.

The fight against stunting is closely aligned with the Sustainable Development Goals (SDGs), particularly Goal 2: Zero Hunger, which aims to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture. By addressing the multifaceted causes of stunting, including behavioral factors, this research supports Indonesia's efforts to reduce stunting rates and improve child health, thereby contributing to the national development agenda outlined in the RPJMN (2020-2024). Furthermore, the integration of behavior change in stunting prevention efforts aligns with the broader SDG agenda of promoting health equity and ensuring that no one is left behind in achieving optimal health and well-being.

METHOD

This internal community service program is carried out by applying the implementation method: lectures, training and mentoring, which aims to provide basic readiness for partners to implement it related to stunting prevention efforts based on behavior change of Posyandu cadres in Mulyoagung Village, Dau District, Malang Regency. The implementation of the implementation method can be described as follows:

Training through tutorial counseling/lectures

This method is carried out with the aim of providing partners with an understanding of: Stunting (concept, causes and effects on child growth), Remembering the Problem of Stunting, and Introduction to the Importance of Behavior Change, Principles, and Stages of Behavior Change

Assistance

The mentoring method will be related to: Activity needs mapping and assessment, Behavior change education, Development of a behavior change-based stunting prevention activity plan, and Implementation in village communities

in a broad and sustainable manner.

The targets of the community service activity program can be described in Table 1.

Table 1. The targets of the community service activity program

TARGET	ACTIVITY	OUTPUT
Training and mentoring of posyandu cadres based on behavior change in stunting prevention efforts in Mulyoagung Village, Dau District, Malang Regency Training and mentoring of Posyandu cadres based on behavior change in stunting prevention efforts in Mulyoagung Village, Dau District, Malang Regency.	1. Training, including: - PreTest - Remembering Problem Stunting - Introduction to the Importance of Behavior Change, Principles, and Stages of Behavior Change 2. Assistance: - Activity needs mapping and assessment - Cadre behavior change education - Broad and sustainable implementation in village communities. 3. Monitoring and Evaluation (MONEV) - Post test - Assessing pretest and post test results - Participants attended 100% from the beginning to the end of the activity - showed high curiosity from participants - Participants actively participated during the activity (enthusiastic to ask questions) - Participants were happy with the material and the way the service team delivered it	1. Posyandu cadres can understand what stunting is, causal factors based on behavior change and its impact. 2. Posyandu cadres can convey the material received during the training in practical activities at the village Posyandu 3. Feedback from participants showed an increase in understanding and mastery in behavior change-based stunting prevention.

RESULTS AND DISCUSSION

Community Service activities in Mulyoagung Village, Dau District, Malang Regency through a training and mentoring program for posyandu cadres based on behavior change as an effort to prevent stunting, are carried out in 4 stages of activity, namely: 1). Initial activities, 2). Identification and socialization, 3). Program implementation, which includes: counseling, training and mentoring in the community related to behavior change-based stunting prevention efforts and 4). Evaluation and Monitoring.

At the initial stage, namely the arrangement of letters of Cooperation with partners (Figure 1), in this activity, a statement was signed from the partners stating that they were willing to cooperate with the service team in the implementation of this service program activity. This initial activity is basically the opening key for the sustainability of this service activity. With the partner's statement of willingness to cooperate, it proves that legally and legally the service team from Muhammadiyah University has received approval from the partner to implement this service activity program.

Then the second stage is identification and socialization, identification activities are carried out by the Team by first conducting silaturahmi as well as coordination with the father and mother of the village head along with posyandu cadres and the head of Pokja IV PKK in the village. this identification activity is carried out with the consideration of knowing firsthand the situation and conditions of the partners, including the potential of human resources and the availability of facilities (facilities and infrastructure) in the village in this case Posyandu Balita. The description of the identification and socialization activities for the implementation of this service is as follows: (1) Plan and prepare an activity program that will be carried out based on the results of the assessment of partners (toddler posyandu cadres). (2) Plan and make a service program agreement with partners. (3) Planning the time, and place and method/technique of the service program. (4) Preparing service program materials, focusing on increasing human resources (HR) through training and mentoring cadres based on behavior change in efforts to prevent stunting. (5) Implementation of service programs in accordance with mutually agreed programs.

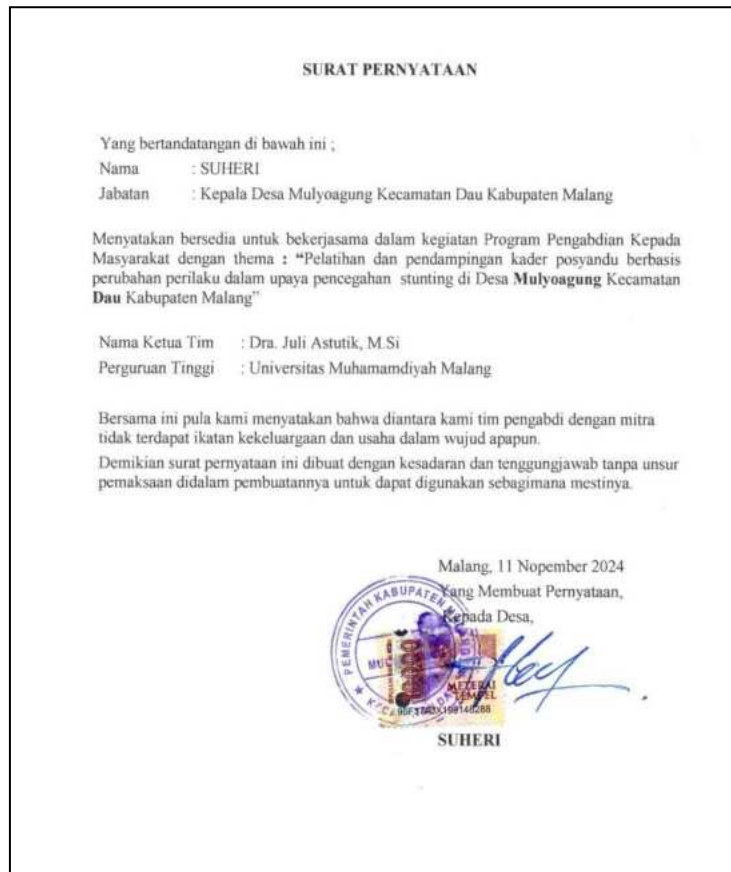


Figure 1. Partner's letter of intent

Socialization is conducted with the aim of: 1) explaining the purpose and objectives of the team's community service program in Mulyoagung Village, Dau District, Malang Regency, 2) avoiding stereotypes or misunderstandings from the surrounding community regarding the team's presence in the village, 3) providing a shared understanding/perception between the service team and all partner members. In this initial activity, we met with the head of the PKK (Mrs. Sri Nurhandayani, the village head) of Mulyoagung Village, Dau District, Malang Regency. The atmosphere of this initial activity can be seen in the Figure 2.



Figure 2. Document about the atmosphere during the Identification and Socialization meeting with the head of the Family Welfare Movement of Mulyoagung Village, Dau District, Malang Regency

Next, the third stage is the implementation of the program, which includes counseling, training, and community support related to efforts to prevent stunting based on behavioral change:

Counseling / Lecture

This counseling is a fundamental activity of this community service program.

This activity was conducted on;

Day/Date : Wednesday, December 18 2024

Place : Mulyoagung Village Hall, Dau District, Malang Regency

Participants : 12 people, from elements of PKK, Posyandu, Pregnant Mothers, Breastfeeding Mothers, and Teenagers (attendance list attached)

The activity began with an outreach on the importance of cooperation in preventing stunting with the following objectives: 1) strengthening the participant groups, 2) fostering a sense of togetherness and shared responsibility, and 4) cultivating a strong sense of togetherness and determination to prevent stunting based on behavioral change. At this stage, the material was delivered by the head of the service: Dra. Juli Astutik, M.Si. and member: Dr. Budi Suprpto, M.Si. The implementation of the activity can be seen in the Figure 3.



Figure 3. Opening ceremony and outreach document by the chairman

The activity continued with the distribution of a pretest to the participants, aimed at understanding their knowledge about stunting before the training and mentoring were provided.

Material 1: The Concept of Stunting, Its Causes, and Its Impact Based on Behavioral Chang

The purpose of this activity is (1) Participants are able to explain the definition, causes, and impacts of stunting and (2) Participants are aware of the stunting problem and are motivated to actively participate in stunting prevention.

Learning Path:

Building Participants' Awareness about Stunting (Session 1 Brainstorming conducted for 10 minutes, session 2 delivering the material, and session 3 in-depth discussion about stunting)

Methods and Media of Learning Tools

The learning method is conducted through lectures, question and answer sessions, discussions, and group presentations. Learning media/tools used: LCD, plano paper, metaplan paper, large and small markers, masking tape, loudspeaker, Group work sheets.

Background

- *The prevalence of stunted children under five in Indonesia in 2013 was 37%, while in 2018 it was 30.8% (Unicef, 2020). The prevalence of stunting among toddlers in Indonesia averaged 36.4% from 2005-2017. In 2021, the prevalence of short children under five years old based on height-for-age index was reported at 6.08%, with 4.2% of children in Bekasi Regency experiencing stunting (Mariani & Barkah, 2024). The prevalence of stunting in Indonesia was reported at 24.4% in 2021, decreasing to 21.6% in 2022. In Central Kalimantan Province, the prevalence in 2022 was 26.9%, with East Kotawaringin Regency at 23.24% in 2021 (Sartika et al., 2024).*
- *The stunting rate in Indonesia remains high, affecting 8.4 million children, or 1 in 3 toddlers. This issue transcends economic status, affecting not only those from poor families but also children from affluent families, highlighting its widespread nature (Martony, 2023). According to Beal et al., (2018) The main determining factors include non-exclusive breastfeeding, low household socioeconomic status, and poor access to healthcare, especially in rural areas. This shows that the prevalence of stunting in non-remote*

areas of Indonesia is 29.7%, primarily affecting children from poor families. However, this also highlights that low education levels and lack of health insurance contribute to stunting, affecting various socioeconomic groups (Poor and Uneducated Parents Increased the Risk of Stunting among Children Living in Non-Remote Areas of Indonesia, 2023).

What is stunting?

- Stunting, often referred to as being short (dwarfism), is a condition of growth failure due to chronic malnutrition (long-term) and psychosocial stimulation as well as repeated exposure to infections, especially during the First 1,000 Days of Life (HPK), which is from fetus to two-year-old children.
- A child is classified as stunted if their height or length is below minus two standard deviations (-2SD) of their age group. (WHO; Kementerian Kesehatan RI).

Why is the 1000 HPK (the period from conception to 24 months of age) important?

- Balanced nutritional intake (pregnant, breastfeeding mothers) protein, carbohydrates, fats, vitamins, and minerals)
- *Child nutrition --> Exclusive breastfeeding (0-6 months), ->Complementary feeding: ◦ 6 – 9 months (pureed food) ◦ 9 – 12 months (introduced to protein sources such as steamed fish, eggs).- 12-24 months introduced to a variety of foods (various vegetables, fruits) can start being given spices (Buckner et al., 2016) (Buckner et al., 2016)*
- Clean and healthy lifestyle
- Access to clean water, sanitation, and a clean environment
- Wash hands with soap
- Stimulation

Cause Factors

Stunting is caused by multi-dimensional factors, not just poor nutrition experienced by pregnant women or toddlers.

- Lack of public knowledge about stunting
- Lack of access to information for teenagers who are prospective parents, pregnant mothers, breastfeeding mothers, and parents/families with children aged 6 months - 24 months and 3-5 years.
- The posyandu cadres do not provide specific counseling related to behaviors to optimize child development.
- Poor parenting (lack of maternal knowledge about health and nutrition before and during pregnancy as well as after childbirth, with 60% of children aged 0-6 months not receiving exclusive breastfeeding)
- The lack of access for families/households to nutritious food
- Lack of access to clean water and sanitation
- The limited healthcare services for mothers during pregnancy and quality early childhood education.

The most decisive intervention to reduce the prevalence of stunting is directed at the First 1000 Days of Life (HPK) of toddlers.

The Impact of Stunting:

1. Child growth disorders (signs of shorter height) are shorter and do not reach the average height or are stunted.
2. The cognitive, motor, and verbal development in children is not optimal, such as being easily affected by infectious diseases and a decline in reproductive health.
3. Learning capacity and performance are lacking during school.
4. These issues can be caused by the behavior of pregnant mothers, breastfeeding mothers, caregivers, and prospective mothers (teenagers).

During the presentation of material 1, the participants were very active in asking questions to the speaker, especially regarding the factors causing stunting. Until now, the participants understood that stunting occurs solely due to the lack of nutritional intake for pregnant mothers and children after birth (health factors alone). With the speaker's explanation that there are equally important factors, namely behaviors that pose a risk of stunting from the 4 target groups (pregnant women, breastfeeding mothers, caregivers, and adolescents) themselves. From this material, the participants' perspectives began to broaden.

During the delivery of the material from the beginning (9:00 AM) until the end (3:00 PM WIB), all participants were very active. It was even quite enjoyable, especially since the presenter delivered the material in a non-boring manner,

using many real-life case examples experienced by the four target groups. In fact, a representative participant from the village Posyandu cadres stated, "This is the first time we have attended a full-day training, but we didn't feel sleepy at all. We even enjoyed the real-life case examples given; the presenter was very engaging. "With the participants' statements, it proves that they are very enthusiastic in following the community service activities in the training and mentoring of Posyandu cadres based on behavioral change in preventing stunting in Mulyoagung Village, Dau District, Malang Regency (Figure 4).



Figure 4. The atmosphere of the training with material on the understanding of stunting, its causes, and impacts

Material 2: Education on Building Behavioral Change in Stunting Prevention

The purpose of this activity is (1) Understanding the importance of behavior change in stunting prevention, (2) The direction of behavior change interventions in stunting prevention. (3) Change of behavior change agents in villages/sub-districts, (4) Understanding risky behaviors and choosing positive behavior change strategies, and (5) Principles of behavior modification.

Content of the Material (see Table 1):

- The importance of changing stunting-risk behaviors
- Target of behavior change
- Principles of behavior change
- Mapping of Stunting Issues or Vulnerabilities and Assessment of Prevention Activity Needs.
-

What is behavior change?

Behavior modification: a process of deliberate or planned activities to establish expected behavior patterns that differ from previous ones. It can occur through: 1. the learning process from social interaction experiences, 2. intentional intervention by others that stimulates behavioral change.

Direction of behavioral change intervention

- Strengthening the encouragement for those being intervened: Avoiding, Reducing, and Eliminating harmful negative behaviors and replacing them with positive behaviors that provide the expected benefits,
- Strengthening the drive for the sustainability of the display of positive behavior patterns

Table 1. Material 2 on Risk Behavior and Preventive Behavior for 4 target groups

TARGET	RISK BEHAVIOR	PREVENTION BEHAVIOR
PREGNANT MOTHER	1. Irregular pregnancy check-ups	1. Regular pregnancy check-ups
	2. Not immunized? Irregular diet, not meeting balanced nutrition	2. Get immunized Eat regularly, meet balanced nutrition
	3. Unbalanced rest patterns,	3. Balanced rest Washing hands at five important times with soap and water flow
	4. Not washing hands at the five essential times with soap and running water,	4. Take regular medication for pregnant women with low blood pressure and other risks,
		5. Exercise appropriately on a regular basis,

TARGET	RISK BEHAVIOR	PREVENTION BEHAVIOR
	5. Not taking regular medication for pregnant women with low blood pressure and other risks 6. Not exercising regularly 7. Using dirty latrines, 8. Drinking water source is not clean, 9. Not taking vitamins 10. Not monitoring weight gain 11. Not managing stress well 12. Does not stimulate fetal development (by monitoring physical development, touch, talking, light) 13. Practicing cooking methods that reduce nutritional content 14. Smoking 15. Drinking alcohol	6. Using a clean latrine 7. Source of clean drinking water, 8. Take vitamins 9. Monitor weight gain 10. Manage stress well 11. Stimulate fetal development (by monitoring physical development, touching, talking, light) 12. Use cooking methods that do not damage the nutritional content. 13. Not smoking 14. Not drinking alcohol
BREASTFEEDING MOM	1. Not giving exclusive breastfeeding for 6 months, breastfeeding in any place 2. Giving inappropriate complementary feeding 3. Allowing children to have difficulty eating or on the contrary, eating too much 4. Not giving complete immunization to children 5. Not checking children's health regularly, treating children to traditional healers 6. Irregular diet, not fulfilling balanced nutrition 7. Doing cooking methods that reduce nutritional content 8. Smoking 9. Drinking alcohol 10. Not managing stress well 11. Not washing hands at five important times using soap and running water, 12. Using dirty latrines, unclean drinking water sources, 13. Not regularly taking care of children's hygiene (bathing, changing children's clothes and bedding)	1. Giving exclusive breastfeeding, breastfeeding in an orderly manner 2. Giving breast milk MP appropriately 3. Ensuring children eat according to balanced nutritional needs 4. Providing complete child immunizations 5. Checking children's health appropriately and regularly 6. Regular exercise, meet balanced nutrition 7. Doing cooking methods that do not damage the nutritional content 8. Not smoking 9. Not drinking alcohol 10. Manage stress well 11. Wash hands at five important times using soap and running water 12. Use a clean latrine with a clean drinking water source, 13. Regularly take care of child hygiene (bathing, changing children's clothes and bedding)
NANNY	1. Does not support the care and health of pregnant women, breastfeeding mothers, does not support good parenting 2. Does not support access of pregnant women, breastfeeding mothers, children to necessary services 3. Smokes near children and pregnant and breastfeeding mothers	1. Support the care and health of pregnant & breastfeeding mothers, 2. Support good parenting 3. Support access of pregnant, breastfeeding mothers, children to services 4. Do not smoke especially near children, pregnant, & breastfeeding mothers. 5. Support prevention, change of risky behavior of pregnant/breastfeeding mothers

TARGET	RISK BEHAVIOR	PREVENTION BEHAVIOR
TEEN	4. Tolerates risky behaviors for stunting of pregnant/breastfeeding mothers/children	
	1. Not taking blood vitamin supplements (for those who are animea)	1. Take blood vitamin supplements (for those who are animea)
	2. Irregular diet that does not meet balanced nutrition, inappropriate dosage, strict diet without health control.	2. A regular diet that meets balanced nutrition, the appropriate dose.
	3. Unbalanced rest patterns	3. Balanced rest patterns
	4. Not washing hands at five important times using soap and running water,	4. Washing hands at five important times using soap and running water,
	5. Not exercising regularly,	5. Exercise regularly,
	6. Use of dirty latrines, unclean drinking water sources	6. Using clean latrines, clean drinking water sources,
	7. Marrying at a young age	7. Taking care of reproductive health
	8. Having sex	8. Not smoking, and not drinking alcohol. Do not abuse drugs / drugs
	9. Not taking care of reproductive health	9. Regularly take care of personal hygiene (bathing, changing clothes linen)
	10. Smoking, drinking alcohol, abusing drugs / drugs	
	11. Not regularly taking care of personal hygiene (bathing, changing clothes and bed linen).	

Source: Materi Tonoto Foundation (Social Welfare Polytechnic)

Material 3: Community-based Stunting Prevention Campaign

Community-based stunting prevention campaigns are organized communications that use face-to-face social media or mass media to build/strengthen awareness of community audiences so that they are interested, interested, eager, and moved to prevent stunting.

Responsible:

One of the community cadres in the Village Stunting Prevention Working Team assigned as the coordinator of the campaign.

Work Team:

Stunting Prevention Ambassadors Other community cadres/managers of relevant local organizations/community leaders, youth leaders, representatives of residents who are willing to work together. Working team: Design & mobilize campaign implementation.

What to do in designing a campaign?

Campaign Objective: Increased community knowledge Increased demand Establishment of mobilizing groups Increased stunting prevention activities Increased participation

Campaign Objectives: Building stunting prevention behaviors, eliminating risk behaviors

Stronger than Competitors: Campaign communications must be stronger than conflicting information/behavioral communications

Target/Recipients: General Public Special groups of primary groups Special groups of secondary groups Special groups of tertiary groups

Channels/Media Face-to-face channels: (with media creative activities such as meetings, exhibitions, marches, art performances, games, fun walks, etc.); indirect with print media (baligo, posters, benner, leaflets, on souvenirs); audio-visual media; digital/social media (such as whatApp/facebook/sms/Tiktok/etc.)

The message is clear: If not face-to-face the message is short, attractively designed, tailored to the characteristics of the target recipient. can raise awareness & motivate change.

Deliverer/Spokesperson: If delivered directly, choose a spokesperson who has expertise in mass communication, masters the message to be conveyed, is recognized, trusted, so that it has the appeal to be noticed by the audience.

Evaluation of Results: Changes Face-to-face media (through creative activities such as meetings, exhibitions, marches, art performances, games, fun walks, etc.), media baligo, posters, banners, souvenir items, pins, messages via whatApp/facebook/sms/Tiktok/etc.)

The formulation of campaign messages must take into account: "Message Dimensions"

1. Introduction to stunting problems & vulnerabilities (refer to stunting cases)
2. Introduction of ways & motivation to change behavior to prevent stunting
3. Appeal to each other

Message noticed:

- **"Specific objectives according to target group"**

Primary Target: Family members especially with 1000 HPK, pregnant women, breastfeeding mothers, mothers with children aged 0-23 months Understand what stunting is, its dangers, risk factors, & recognize symptoms. Watch out for at-risk pregnant women Watch out for heavy birth babies

- Recognize how & be motivated to prevent:
- Fulfill nutrition for pregnant women,
- Blood supplement tablets,
- Monitor weight gain
- Space pregnancies
- Avoid pregnancy at age < 20/ > 40.
- Exclusive breastfeeding for healthy, smart babies.
- Make sure the child eats a balanced diet, breast milk until the age of 2 years.
- Stimulate child development
- Always use clean water & healthy latrines.
- Wash hands with soap and running water at 5 important times:
- Prevent Malaria mosquito bites in pregnant women with other infections.
- Have routine pregnancy check-ups and give birth at a health facility.
- Weigh your children regularly, measure their height, and record it in the MCH book. Get basic immunizations at the posyandu/health facility.
- If pregnant women have symptoms of malaria, seek treatment and take blood supplement tablets.
- If there are symptoms immediately consult a cadre/doctor.

Specific objectives Secondary targets: Adolescents. WUS, Spouse/Father-to-be

- Understand what stunting is, its dangers, risk factors, & recognize symptoms.
- Watch out for adolescents who are married, pregnant, giving birth
- Watch out for anemic, malnourished women
- Watch out for adolescents and women who do not have clean and healthy behaviors.
- Prevent early.
- Do not get married < 20 years old
- Plan pregnancy wisely.
- Eat balanced nutrition and take Blood Addition Tablets regularly (1 tablet every week).
- Check Hemoglobin (HB) levels regularly.
- Do physical activity at least 30 minutes/day.
- Get enough rest.
- Do not smoke and do not drink alcohol.
- Use clean water and healthy latrines.
- Wash hands with soap and water productively with a healthy lifestyle.
- Do not engage in promiscuity.
- Have a regular health check-up at a health service.
- Husbands and/or fathers-to-be, as well as other family members, are encouraged to be involved in family health maintenance from an early age, fulfill needs (nutrition, health checks) and provide psychological support, moral support to the mother-to-be, in order to establish the ideal nutritional status of the child-to-be.

- Husbands of pregnant women/families are involved in fulfilling needs including pregnant women's health, care and stimulation.

Specific Objective Secondary Objective: Neighborhood caregivers

- Understand what stunting is, its dangers, risk factors, & recognize symptoms.
- Be aware of babies born weighing < 2.5 kg, and < 48 cm in length.
- Be aware of babies who do not receive early breastfeeding initiation, exclusive breastfeeding & proper complementary feeding.
- Help manage multiple diarrhea in children under five years old

Recognize how & be motivated to prevent:

- Support early initiation of breastfeeding and exclusive breastfeeding for healthy, smart babies.
- Support the feeding of children with balanced nutrition, breast milk until the age of 2 years.
- Engage in child development stimulation Always use clean water & healthy latrines for children and the whole family.
- Caregiver, whole family, child, wash hands with soap with running water at 5 important times
- Prevent infants from infectious diseases especially recurrent
- Support regular weighing, measuring the height of children, and record in the KIA book.
- Support the provision of basic immunizations to children at the Posyandu/health facility.
- If pregnant women have symptoms of Malaria, treat and take blood supplement tablets.
- If there are symptoms, consult a cadre/doctor immediately.

Mentoring

Mentoring activities are carried out in 2 ways, the first is assistance during simulations on: (1) Mapping stunting problems/vulnerabilities and needs assessment, (2) Preparation of worksheets to identify negative behaviors and positive behaviors to prevent stunting, (3) Preparation of a stunting prevention activity plan, (4) Implementation of activities by posyandu cadres in preventing stunting based on behavior change in the village community in a broad and sustainable manner.

Mapping stunting problems/vulnerabilities and needs assessment. In this assistance, participants were asked to map pregnant women, breastfeeding mothers in the area of one RW in Mulyoagung village, Dau sub-district, Malang Regency (Figure 5 and Figure 6).



Figure 5. Data on Stunting Vulnerability Mapping and Needs Assessment Materials



Figure 6. Documentation of assistance during the Stunting Vulnerability Mapping Simulation and Needs Assessment

Preparation of worksheets Identification of negative behavior and positive behavior for stunting prevention

In this activity participants are asked to identify negative behavior and positive behavior towards target cadres, namely pregnant women, breastfeeding mothers, caregivers of children aged 6 months - 2 years, and adolescents. The purpose of assistance with this material is to determine the understanding as well as the ability of participants to make identification, which in turn participants can campaign for the results of the identification through the implementation of the village Posyandu casework program (Figure 7).

Lembar kerja
Identifikasi perilaku negative dan perilaku positif pencegahan Stunting
(bahan bacaan 35-38)

Sasaran Kader	Perilaku berisiko (negative)	Perilaku positif pencegahan Stunting
Ibu hamil		
Ibu menyusui		
Pengasuh anak usia 6 bulan- 2 tahun		
Kader		
Wanita Usia subur remaja		

Figure 7. Assistance material for preparing worksheets Identification of negative behavior and positive behavior in stunting prevention

Preparation of a stunting prevention activity plan

In this activity, participants are asked to develop a stunting prevention activity plan (Figure 8).



Figure 8. Activity document Preparation of stunting prevention activity plan

In this mentoring material, participants were invited to actively participate starting from mapping and assessing needs, preparing worksheets to identify negative behaviors and positive behaviors to prevent stunting, preparing plans for stunting prevention activities. Participants were very excited, with the role of each participant in this assistance showing that the participants had understood the purpose and purpose of providing this material, as evidenced by all the abilities that the participants had, finally the participants were able to arrange the 3 assistance activities well. Participants were happy as shown by joking and laughing pleasantly because they had been able to complete properly and correctly the tasks that had to be made. When they finished working on the task, the participants expressed their emotions of joy and satisfaction while jumping and clapping their hands. The atmosphere was very boisterous but still serious and fun.

Monitoring and Evaluation

Program control is carried out through monitoring/supervision and evaluation activities as well as reporting on the implementation of activities and follow-up coaching that will be carried out to partners. Control of the entire process and mentoring activities is aimed at: 1) Ensure that all stages of the activity are in accordance with the established processes and mechanisms, 2) Controlling activities to be in accordance with the predetermined plan, and 3) Maintaining the quality of activities to be in accordance with the agreed plan between the service team and partners.

Monitoring and Evaluation has been carried out regarding the quantity and quality of the implementation of this service program. In terms of quantity, this activity program can be declared successful due to the participation of all participants as evidenced by: a) attending on time, b) attending 100% in each activity. While qualitatively this program was declared successful because the participants were motivated by: a) bringing material notes in every activity carried out, b) actively asking questions in every activity meeting, c) being able to answer correctly every question asked. Assessing the results of the pre-test and post-test, the results of which can be seen in the Figure 9.



Figure 9. Diagram of Pre-Test and Post-Test Results

CONCLUSION

The implementation of the service program that has been carried out in the form of training and mentoring has succeeded in increasing the understanding of Mulyoagung village Posyandu cadres about: 1) stunting, its causes and impacts, 2) The importance of behavior change in preventing stunting. Through interactive methods, such as lectures, simulations, Posyandu cadres can apply the material received during training in practical activities in the village Posyandu. Feedback from participants showed an increase in understanding and mastery of behavior change-based

stunting prevention. Partners have been able to deliver training materials to the community through PKK and posyandu activities.

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REFERENCES

- Astawa, I. (2025). Partisipasi masyarakat dalam meningkatkan pembangunan di Desa Dalang Kecamatan Selemadeg Timur Kabupaten Tabanan. *Widyanata*, 22(1), 31-38. <https://doi.org/10.54836/widyanata.v22i1.348>
- Beal, T., Tumilowicz, A., Sutrisna, A., Izwardy, D., & Neufeld, L. M. (2018). A review of child stunting determinants in Indonesia. *Maternal and Child Nutrition*, 14(4). <https://doi.org/10.1111/MCN.12617>
- Buckner, C. A., Lafrenie, R. M., Dénoimée, J. A., Caswell, J. M., Want, D. A., Gan, G. G., Leong, Y. C., Bee, P. C., Chin, E., Teh, A. K. H., Picco, S., Villegas, L., Tonelli, F., Merlo, M., Rigau, J., Diaz, D., Masuelli, M., Korrapati, S., Kurra, P., ... Mathijssen, R. H. J. (2016). We are IntechOpen , the world ' s leading publisher of Open Access books Built by scientists , for scientists TOP 1 %. *Intech*, 11(tourism), 13. [https://doi.org/10.55324/ijoms.v2i1.264](https://www.intechopen.com/books/advanced-https://doi.org/10.55324/ijoms.v2i1.264)
- Chabibah, N., Kristiyanti, R., & Khanifah, M. (2021). *Factor analysis of intranatal and postnatal toward stunting*. 10(1), 15–20. <https://doi.org/10.30591/SIKLUS.V10I1.2139biometric-technologies/liveness-detection-in-biometrics>
- Fatonah, S., & Wibowo, M. (2017). Dampak Kampanye Germas Terhadap Perubahan Perilaku Dan Puskesmas Imogiri I. *Universitas Ahmad Dahlan Repository*, May, 1–11.
- Flores-Quispe, M. del P., Restrepo-Méndez, M. C., Restrepo-Méndez, M. C., Maia, M. F. S., Maia, M. F. S., Ferreira, L. Z., & Wehrmeister, F. C. (2019). Trends in socioeconomic inequalities in stunting prevalence in Latin America and the Caribbean countries: differences between quintiles and deciles. *International Journal for Equity in Health*, 18(1), 156. <https://doi.org/10.1186/S12939-019-1046-7>
- Givani, C. L. (2022). Factors of stunting from mother's pregnancy to toddler under 59 months-old. *Indonesian Journal of Multidisciplinary Science*
- Gusriani, G., Noviyanti, N. I., Wahida, W., Ruqaiyah, R., & Octamelia, M. (2023). Faktor determinan stunting pada balita : Tinjauan literatur. *Jurnal Kesehatan Delima Pelamonia*, 7(1), 25–33. <https://doi.org/10.37337/jkdp.v7i1.354>
- Mahendra, G. (2024). Efektivitas posyandu dalam meningkatkan kesehatan lansia di Desa Bumi Rapak Kecamatan Kaubun Kabupaten Kutai Timur Provinsi Kalimantan Tengah. *Widyanata*, 21(2), 95-100. <https://doi.org/10.54836/widyanata.v21i2.1324>
- Mahenndra, G. (2025). Peranan perangkat desa dalam meningkatkan pengelolaan data kependudukan berdasarkan Undang Undang Republik Indonesia Nomor 23 Tahun 2006 di Desa Padangaji Kecamatan Selat Kabupaten Karangasem. *Widyanata*, 22(1), 39-47. <https://doi.org/10.54836/widyanata.v22i1.159>
- Mariani, F., & Barkah, A. (2024). Hubungan pengetahuan dan sikap dengan stunting pada balita di Puskesmas Setu 1. *Manuju*, 6(3), 1009–1026. <https://doi.org/10.33024/mnj.v6i3.11110>
- Marsaoly, O. H., Nurwijayanti, N., Ambarika, R., & Maria, S. K. (2021). Analysis of the causes of stunting in toddlers in the work area of gandasuli community health center South Halmahera Regency North Maluku (Qualitative Study). *Journal for Quality in Public Health*, 4(2), 314–328. <https://doi.org/10.30994/jqph.v4i2.186>
- Martony, O. (2023). Stunting di Indonesia: Tantangan dan solusi di era modern. *Journal of Telenursing (Joting)*. <https://doi.org/10.31539/joting.v5i2.6930>
- Naryono, E. (2023). *Stunting, the main threat to human quality*. <https://doi.org/10.31219/osf.io/2w9yn>
- Nuraida, I., & Putri, D. L. (2024). Edukasi kesehatan sebagai upaya peningkatan pengetahuan ibu hamil dan kesehatan balita. *Taawun*, 4(01), 85–92. <https://doi.org/10.37850/taawun.v4i01.595>
- Nurhidayah, S., Basri, H., Ridwan, R., & Suarlan, I. (2022). Penguatan perubahan perilaku dalam percepatan penurunan stunting. *An-Nizam*, 1(3), 210–218. <https://doi.org/10.33558/an-nizam.v1i3.5738>
- Putri, A. P., & Rong, J. R. (2021). Parenting functioning in stunting management: A concept analysis. *Journal of Public Health Research*, 10(2), 213–219. <https://doi.org/10.4081/jphr.2021.2160>
- Putri, F. E., Permadi, D. I., Aninfento, D. S., Muhidayani, R. E. S., Surachman, D. F., Ijah, U. J. J., Mustaqrobin, A. S.,

- Muslihatun, M., Hadi, I., Hannisa, P., & Hayati, H. (2024). Upaya peningkatan pengetahuan ibu hamil dalam pencegahan stunting di desa teratak, batukliang utara. *Jurnal Pepadu*, 5(2), 275–280. <https://doi.org/10.29303/pepadu.v5i2.4915>
- Rahendra, Y., & Dwihestie, L. K. (2023). The relationship between mothers' knowledge on posyandu services and their frequency of visit To Posyandu In Karangrejo Village Purworejo Regency. *Jurnal Kebidanan Kestra*, 6(1), 1–8. <https://doi.org/10.35451/jkk.v6i1.1518>
- Rahmayanti, B. M., Thei, R. S. P., Saputri, D. A., & Ramdani, S. (2022). Upaya percepatan pencegahan dan penurunan stunting melalui program pendampingan keluarga di Desa Pakuan Kecamatan Narmada. *Jurnal Pengabdian Magister Pendidikan IPA*, 5(4), 175–180. <https://doi.org/10.29303/jpmipi.v5i4.2415>
- Rambe, K. S. (2022). Pola asuh orangtua dengan kejadian stunting pada balita di kelompok bkb hi. *Jurnal Ilmiah PANNMED*, 17(3), 575–580. <https://doi.org/10.36911/pannmed.v17i3.1509>
- Sartika, D., Sanyoto, D. D., Febriana, S. K. T., Adhani, R., & Suhartono, E. (2024). Analysis of factors associated with the incidence of stunting in toddlers in the working area of Ketapang II Health Center, East Kotawaringin Regency. *Journal La Medihealthico*, 5(2), 346–355. <https://doi.org/10.37899/journallamedihealthico.v5i2.1224>
- Soetjatie, L., Utomo, B., & Titisari, D. (2022). Assistance in the use and utilization of posyandu applications for monitoring toddler growth and development for Posyandu Cadres In Bulak Village Surabaya City, East Java. <https://doi.org/10.35882/ficse.v1i4.25>
- Suharsih, S., & Rahayu, A. (2023). Relationship between budget policy, fiscal capacity and stunting prevalence in indonesia. *International Journal of Advanced Economics*. <https://doi.org/10.51594/ijae.v5i7.551>
- Suriati, I. (2022). Kampanye Aki Dan Akb Di Dinas Kesehatan Kota Palopo. *Jurnal EMPATI (Edukasi Masyarakat, Pengabdian Dan Bakti)*, 3(3), 191. <https://doi.org/10.26753/empati.v3i3.843>
- Vijayalakshmi, N. (2019). Behavior modification techniques – An awareness study. *Shanlax International Journal of Education*, 7(2), 20–24. <https://doi.org/10.34293/education.v7i2.333>
- Wiranti, Z., Suratman, S., & Yogopriyatno, J. (2023). Efektivitas pelayanan kesehatan bagi ibu hamil dan bayi baru lahir di Puskesmas Kecamatan Tanjung Sakti Pumi Kabupaten Lahat. *Widyanata*, 20(2), 68-74. <https://doi.org/10.54836/widyanata.v20i2.1150>
- Yuda, I. M., Astawa, I. W., Lesmana, P. S., & Kusuma Putra, C. G. (2023). Analisa kegiatan pelayanan di ruang hemodialisis rumah Sakit Umum Daerah Sanjiwani Gianyar Kabupaten Gianyar Provinsi Bali. *Widyanata*, 20(2), 90-100. <https://doi.org/10.54836/widyanata.v20i2.1154>
- Zakiyya, A., Widyaningsih, T., Sulistyawati, R., & Pangestu, J. F. (2021). Analisis kejadian stunting terhadap perkembangan anak usia 6-24 bulan. 3(1), 6–16. <https://doi.org/10.31983/JSK.V3i1.6892>



Empowering community on utilizing *purun* as liquid organic fertilizer in Tuwung Village Pulang Pisau Regency

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-11-17 Revised: 2025-04-06 Accepted: 2025-04-20 Published: 2025-04-20 Keywords Community service Liquid organic fertilizer <i>Purun</i> Sustainable agriculture	Community service is crucial in addressing local challenges and empowering communities through knowledge and practical solutions. Tuwung Village, located in Kahayan Tengah Subdistrict, Pulang Pisau Regency, Central Kalimantan, includes 1,297 hectares of village forest within a convertible production forest area. With a population of 727 people, most of whom work in the agricultural sector, the community faces challenges related to using environmentally harmful chemical fertilizers. Despite the village's rich biodiversity, applying liquid organic fertilizers remains uncommon. <i>Purun</i> plants, a local resource, serve as a promising raw material for liquid organic fertilizer production due to their nutrient-rich composition, which benefits sustainable agriculture. This program focused on training the Tuwung community in utilizing <i>purun</i> as a raw material for liquid organic fertilizer to improve agricultural productivity while reducing dependence on environmentally damaging chemical fertilizers. Evaluation through pre- and post-tests demonstrated significant increases in participants' knowledge, skills, and interest in sustainable agricultural practices, with 88% of participants expressing a strong interest in using pure-based liquid organic fertilizer in the future. The program aligns with the United Nations' Sustainable Development Goals (SDGs), particularly Goal 2 (Zero Hunger) and Goal 12 (Responsible Consumption and Production), by promoting sustainable farming practices and encouraging the responsible use of local resources.
Kata Kunci Pengabdian kepada Masyarakat Pertanian Berkelanjutan Pupuk Organik Cair <i>Purun</i>	Pemberdayaan masyarakat dalam pemanfaatan <i>purun</i> sebagai pupuk organik cair di Desa Tuwung Kabupaten Pulang Pisau. Pengabdian kepada masyarakat merupakan upaya penting untuk mengatasi tantangan lokal dan memberdayakan komunitas melalui pengetahuan dan solusi praktis. Desa Tuwung, yang terletak di Kecamatan Kahayan Tengah, Kabupaten Pulang Pisau, Kalimantan Tengah, memiliki hutan desa seluas 1.297 hektar di dalam kawasan hutan produksi konversi (HPK). Dengan populasi penduduk sebanyak 727 orang dan mayoritas dari sektor pertanian, masyarakat desa Tuwung menghadapi tantangan dalam penggunaan pupuk kimia yang merusak lingkungan. Meskipun memiliki potensi kekayaan hayati yang besar, penggunaan pupuk organik cair (masih jarang dilakukan di desa Tuwung). Tanaman <i>purun</i>, yang merupakan sumber bahan baku potensial untuk POC, memiliki kandungan nutrisi yang menguntungkan untuk pertanian. Oleh karena itu, pelatihan mengenai penggunaan tanaman <i>purun</i> sebagai bahan baku pupuk organik cair di desa Tuwung menjadi penting dalam meningkatkan produktivitas pertanian secara berkelanjutan dan mengurangi ketergantungan pada pupuk kimia yang merugikan lingkungan. Evaluasi kegiatan dilakukan melalui pre-test dan post-test. Hasil evaluasi menunjukkan peningkatan yang signifikan dalam pengetahuan, keterampilan, dan minat peserta terhadap praktik pertanian berkelanjutan. Sebanyak 88% peserta menunjukkan minat yang kuat untuk menggunakan pupuk organik cair berbahan dasar <i>purun</i> di masa depan. Program ini juga sejalan dengan Tujuan Pembangunan Berkelanjutan (SDGs), khususnya Tujuan 2 (Tanpa Kelaparan) dan Tujuan 12 (Konsumsi dan Produksi yang Bertanggung Jawab).

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INTRODUCTION

Community service is vital in addressing local challenges by empowering communities with knowledge and practical solutions. In agricultural regions, initiatives promoting sustainable practices can significantly improve productivity, environmental health, and economic resilience (Neneng et al., 2022; Wahdah et al., 2023). One such initiative in Tuwung Village focuses on introducing liquid organic fertilizers derived from *purun*, a native wetland plant, as an innovative and sustainable solution for local farmers (Adiwijaya & Yovita, 2023).

Tuwung Village is a predominantly agricultural community where most residents rely on farming as their primary source of income. One of the vital farming activities in the village is upland rice cultivation (*padi ladang*), which is practiced on peatland soils. These peatlands are part of a tidal swamp ecosystem classified as Type C and D, characterized as dryland areas (Suharno et al., 2021). While peatlands offer unique agricultural opportunities, they also present challenges such as nutrient-poor soils (Abdillah & Widiyastuti, 2022) and a high susceptibility to degradation when managed unsustainably (Ellya et al., 2020).

To support sustainable farming practices, many farmers in Tuwung Village have expressed a desire to utilize environmentally friendly fertilizers rather than relying on chemical fertilizers (Wang et al., 2018). This shift is driven by the high cost of chemical inputs, concerns about soil degradation, and an increasing awareness of the environmental impacts of synthetic fertilizers (Abidin et al., 2022; Marlina et al., 2022). *Purun* has been identified as a valuable local resource for meeting this need. Traditionally used for crafting mats and other artisanal products (Azni et al., 2023), *purun* is rich in organic matter and nutrients (Asikin & Thamrin, 2012; Korhikmah et al., 2022), making it highly suitable for conversion into liquid organic fertilizer (Abidin et al., 2022).

Liquid organic fertilizers offer several advantages, including faster nutrient absorption by plant roots compared to their solid counterparts. The nutrients present in liquid organic fertilizers, such as potassium (K), phosphorus (P), calcium (Ca), magnesium (Mg), and sodium (Na), have been shown to influence plant growth significantly (Bulkaini et al., 2022; Nasution et al., 2024). Additionally, liquid organic fertilizers contain essential elements like carbon and nitrogen, which are critical in improving soil fertility and supporting sustainable agriculture (Bulkaini et al., 2022; Warintan et al., 2021). Research conducted by Khairullah and his team has demonstrated that fertilizers derived from *purun* effectively reduce Fe toxicity in paddy fields. This phenomenon is attributed to organic acids released by decomposing organic matter, which chelate dissolved Fe and lower its excessive availability in the soil (Khairullah et al., 2020). Such properties make *purun*-based fertilizers particularly beneficial for use in peatlands and other soils prone to nutrient imbalances, highlighting their potential to improve crop productivity while ensuring soil health (Hardiansyah et al., 2022).

This community service program involved the farmer's group *Bawi Hapakat*, village officials, and the Chemistry Study Program faculty members at Universitas Palangka Raya. The Faculty of Mathematics and Natural Sciences at Universitas Palangka Raya supported the program through the Lecturer Program for Community Empowerment. Collaboration efforts among these stakeholders ensured the effective implementation of the program and its alignment with local needs and resources. Through participatory workshops, farmers in Tuwung Village learned the techniques for harvesting *purun*, processing it into liquid fertilizer, and applying it to their crops. The program emphasized the benefits of environmentally friendly farming practices, including cost savings, improved soil health, and reduced dependency on chemical fertilizers.

By leveraging local resources and providing practical education, this community service initiative sought to empower farmers in Tuwung Village to adopt sustainable agricultural practices. This study examines the program's outcomes, focusing on the socialization process, the engagement of farmers, and their willingness to transition toward eco-friendly fertilizers like *purun*-based liquid fertilizer, thereby contributing to the achievement of relevant SDGs (Patunah & Pradani, 2024). The utilization of *purun*-based liquid fertilizers aligns with the United Nations' Sustainable Development Goals (SDGs), particularly Goal 2 (Zero Hunger), Goal 12 (Responsible Consumption and Production), and Goal 15 (Life on Land). By promoting sustainable agricultural practices, this initiative contributes to enhancing food security (Goal 2) while ensuring environmentally responsible use of local resources (Goal 12) (Sorooshian, 2024).

Although sustainable agriculture has gained increasing attention in recent years, particularly regarding the use of organic fertilizers, most studies have concentrated on *commercially* available bio-fertilizers or large-scale composting methods (Chew et al., 2019; Riaz et al., 2020). A few researchers have focused on the utilization of Palangka Raya wetland plants as bio-resources (Jaya et al., 2022; Ruthena et al., 2023). However, there have been limited studies concerned with empowering rural farming communities to process and apply locally abundant *purun* (*Lepironia articulata*) into liquid fertilizer through community-based participatory approaches. Therefore, this research intends to explore the potential of *purun*-based liquid fertilizer as a sustainable alternative to chemical fertilizers while assessing its adoption among local farmers. The objectives of this research are to (1) evaluate the effectiveness of participatory training methods, (2) assess the level of farmer engagement and awareness, and (3) analyze the potential of *purun*-based liquid fertilizer to support sustainable agricultural practices aligned with the Sustainable Development Goals (SDGs).

METHOD

The community empowerment program for producing liquid organic fertilizer from *purun* plants was designed to enhance soil fertility and agricultural productivity in Tuwung Village, Pulang Pisau Regency. This program employed outreach and training methods to ensure effective knowledge transfer and practical skill development among participants. The implementation stages included coordination with local village officials, trial production of liquid organic fertilizer, socialization sessions, and evaluating the program's outcomes (see Figure 1).

Coordination with local village officials

The program began with coordination activities involving village officials to determine the critical aspects of the program, including the content to be delivered, the venue, the schedule, and the list of participants. A detailed event rundown was also prepared during this stage to ensure smooth execution. The coordination phase was critical in aligning the program's objectives with the community's needs and providing maximum participation.

Trial production of liquid organic fertilizer

Before the community training, the team tested producing liquid organic fertilizer using *purun*. This step allowed the team to refine the production process and document the procedures in a pocket guidebook to distribute to participants. The trial production also yielded fertilizer samples, later shared with participants during the training session as tangible examples of the program's outcomes.

Socialization session

These sessions were attended by members of the farmer group from Tuwung Village. The outreach component included presentations and discussions to give participants a comprehensive understanding of liquid organic fertilizer, its benefits, and the advantages of using *purun* as a raw material. The team explained the unique properties of *purun*, such as its nutrient-rich content and ability to improve soil health, making it an ideal candidate for eco-friendly fertilizer production. Participants were guided through harvesting, processing, and fermenting *purun* into usable fertilizer. The team ensured the training was interactive and allowed participants to ask questions and clarify doubts.

Evaluation the program's outcomes

The program's effectiveness was evaluated using before and after tests given to the participants. The pre-test captures participants' initial understanding, while the post-test measures the knowledge gained through the program. The test assessed the community's perspective and expertise on using *purun* as liquid organic fertilizer.



Figure 1. Stages of a community service program for utilizing *Purun* as a liquid organic fertilizer in Tuwung Village

RESULTS AND DISCUSSION

Preparation

The program began with the trial production of liquid organic fertilizer using *purun* to ensure the feasibility and quality of the method. A total of 1.5 kg of chopped *purun* was mixed with 12 liters of water, 24 grams of brown sugar, and 72 mL of EM-4. The mixture was stirred until homogenized and left to ferment for 10 days. After fermentation, the fertilizer was filtered and packaged into sealed plastic bottles for distribution during the training sessions. The materials and equipment used are detailed in Table 1, providing a clear guide for replicating the process. The trial also served as a basis for documenting step-by-step instructions in a pocket guidebook, which was distributed to participants.

Socialization Activity

The community service program was held on 9 July 2024, from 8:00 AM to 12:00 PM at the Tuwung Village Hall. The event was attended by 25 participants, primarily members of the local farmer group, *Bawi Hapakat*. The program was organized by a team of lecturers from the Chemistry Study Program, Faculty of Mathematics and Natural Sciences Universitas Palangka Raya, and several university students. Before the session began, participants received a pocket guidebook and pre-test questionnaires.

The pocket guidebook contained essential information on the *purun* plant, an overview of liquid organic fertilizer, and step-by-step instructions for producing liquid organic fertilizer from *purun*. The guidebook was designed to enhance participants' understanding and serve as a practical resource to assist farmers in independently replicating the process. An example of the contents of the pocket guidebook is shown in Figure 2.

Table 1. Materials and Equipment for Producing *Purun*-Based Liquid Organic Fertilizer

No	Materials dan Equipment	Quantities
1	<i>Purun</i>	1.5 kg
2	Water	12 Liters
3	Brown sugar	24 grams
4	EM-4	72 mL
5	Blender	1 set
6	Buckets	2 pieces
7	Basins	2 pieces
8	Knives	2 pieces
9	Plastic Bottles	40 pieces



Figure 2. The pocket guidebook on the production of liquid organic fertilizer from *purun* plants

The program began with an introductory session on the general concept of organic fertilizers, their benefits, and how they compare to chemical fertilizers. Fertilizers, as explained, are substances added to soil to supply essential nutrients required for plant growth. Depending on their material sources, fertilizers are classified as organic or inorganic, and based on their forms, they can be categorized as solid or liquid fertilizers.

Liquid organic fertilizers were discussed in detail, emphasizing their benefits. Liquid fertilizers are nutrient-rich solutions that dissolve quickly and provide essential elements needed by plants, enabling quick absorption by roots. One of the advantages of liquid organic fertilizers is their ability to supply nutrients precisely according to the needs of plants, making them more efficient (Efelina et al., 2018; Martínez-Alcántara et al., 2016).

Following the presentation, participants engaged in a hands-on demonstration of the materials and procedures used in producing *purun*-based liquid organic fertilizer. Key components, including brown sugar and EM-4, were highlighted, and the fermentation process's importance and duration were explained. Participants were also instructed on the application techniques for liquid organic fertilizer and the recommended storage conditions to maintain its effectiveness.

The socialization activity included a participatory discussion session, where participants were encouraged to ask questions about their specific agricultural conditions. This interactive approach allowed the facilitators to address

practical challenges and provide tailored solutions to the farmers' concerns (Figure 3). The finished fertilizer product and the raw materials were also showcased to help participants better understand the process and the outcomes.



Figure 3. Question and Answer Activities from Community Service Participants

By the end of the session, participants demonstrated an increased understanding of liquid organic fertilizers, specifically those made from *purun*. The combination of theoretical education, practical demonstrations, and interactive discussions ensured that the participants gained knowledge and confidence in applying what they learned to their agricultural practices. This holistic approach improved their technical skills and encouraged them to adopt environmentally friendly and sustainable farming methods.

Evaluation

The evaluation of the community service program on producing *purun*-based liquid organic fertilizer highlighted both the participants' initial knowledge and the program's impact on their understanding and practices. Feedback was collected through pre-test and post-test questionnaires distributed to the 25 participants from Tuwung Village. The pre-test results, as presented in Table 2, reveal that most participants were already familiar with liquid organic fertilizers and their general benefits. All participants demonstrated knowledge of liquid organic fertilizer, indicating that the idea was familiar within the community. Furthermore, 76% (19 out of 25 participants) understood the benefits of liquid organic fertilizer, particularly its role in enhancing soil fertility and supporting plant growth. The same percentage of participants reported prior experience making liquid organic fertilizer using other materials, showcasing a baseline familiarity with liquid organic fertilizers. However, while 60% (15 participants) were aware of the benefits of *purun* as a plant, only 4% (1 participant) had ever attempted to produce liquid organic fertilizer from *purun*. These findings suggest that although participants had a strong foundation in the general concept of liquid organic fertilizer, their awareness of *Purun*'s potential as a resource for liquid organic fertilizer was minimal. This highlights the importance of the program in bridging this knowledge gap and introducing *purun* as an alternative material for sustainable fertilizer production. Although *purun* is known for its traditional use in handicrafts and wetland conservation, its potential as a bio-resource for sustainable agriculture remains underexplored. Thus, participatory training and knowledge transfer methods, as applied in this program, have proven effective in empowering rural communities to adopt environmentally friendly farming practices (Kalalinggi et al., 2024; Ma'arif et al., 2020).

Table 2. Pre-Test Feedback

No	Question	Response
1	Are you familiar with liquid organic fertilizer?	All participants were familiar with liquid organic fertilizer
2	Do you know the benefits of liquid organic fertilizer?	76% (19 of 25) participants understood the benefits of liquid organic fertilizer
3	Have you ever made liquid organic fertilizer?	76% (19 of 25) participants had made liquid organic fertilizer
4	Are you aware of the benefits of <i>purun</i> ?	60% (15 of 25) participants were aware of <i>purun</i> 's benefits
5	Have you made liquid organic fertilizer from <i>purun</i> ?	Only 4% (1 of 25) participants had made liquid organic fertilizer from <i>purun</i>

After the program, a post-test was conducted to evaluate the participants' understanding following the socialization and training sessions. The results revealed significant improvements in knowledge, practical skills, and interest among the participants. All attendees clearly understood liquid organic fertilizers and their benefits, emphasizing their

effectiveness in improving soil fertility and plant growth. Furthermore, all participants agreed that producing liquid organic fertilizers was easy to implement. Notably, 56% of the participants perceived liquid organic fertilizer production as more economical than synthetic fertilizer, reflecting an awareness of the cost advantages of using local and sustainable resources like *purun*. Additionally, 88% expressed a strong interest in making liquid organic fertilizers from *purun* in the future, showcasing the potential for widespread adoption of this method (Table 3).

Table 3. Post-Test Feedback

No	Question	Response
1	Are you familiar with liquid organic fertilizer?	All participants understood the definition of liquid organic fertilizer
2	Do you know the benefits of liquid organic fertilizer?	All participants understood the benefits of liquid organic fertilizer
3	Is liquid organic fertilizer production easy to implement?	All participants agreed the process was simple
4	Is liquid organic fertilizer production less economical than synthetic fertilizers?	56% felt it was more economical than synthetic fertilizers
5	Are you interested in making liquid organic fertilizer from <i>purun</i> ?	88% expressed strong interest in making <i>purun</i> -based liquid organic fertilizer

These findings indicate that the program successfully enhanced participants' awareness of the practical and economic benefits of *purun*-based liquid organic fertilizers. The training boosted confidence in the ease of production and motivated farmers to integrate this sustainable method into their agricultural practices. The simplicity and practicality of the process were key factors in increasing participants' enthusiasm for adoption. Furthermore, many participants recognized that *purun*-based liquid organic fertilizer production was more advantageous than synthetic fertilizer in terms of cost, environmental impact, and soil health. The hands-on training increased participant's confidence in the simplicity of the production process and motivated them to adopt this sustainable method in their agricultural practices. Similar outcomes were observed in other studies where participatory training improved farmer's willingness to implement organic practices (Irham et al., 2024; Tamtomo, 2021). Using *purun*-based liquid fertilizers aligns with the United Nations' Sustainable Development Goals (SDGs). Specifically, it supports Goal 2 (Zero Hunger) by promoting sustainable agricultural practices that improve food security (Ciceri & Allanore, 2019). It aligns with Goal 12 (Responsible Consumption and Production) by encouraging using local, renewable resources to minimize environmental impact. By fostering the adoption of environmentally friendly farming methods, this initiative addresses local agricultural challenges and contributes to broader global sustainability objectives.

CONCLUSION

The community service program in Tuwung Village successfully introduced *purun*-based liquid organic fertilizers as a sustainable and cost-effective alternative to synthetic fertilizers. The program equipped farmers with the skills to independently produce and apply these eco-friendly fertilizers by combining education, practical demonstrations, and participatory discussions. Evaluation results showed significant increases in knowledge and interest, with 88% of participants eager to adopt *purun*-based fertilizers due to their economic and environmental benefits. Aligning with the United Nations' SDGs, this initiative addresses local agricultural challenges while contributing to global sustainability goals. The program highlights *Purun*'s potential as a resource for sustainable agriculture and emphasizes the importance of local materials and community engagement for replicable eco-friendly practices.

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REFERENCES

- Abdillah, M. H., & Widiyastuti, D. A. (2022). Peningkatan Kualitas Kimia Tanah Sulfat Masam dengan Aplikasi Kombinasi Bahan Organik Lokal dan Limbah Agroindustri. *Jurnal Ilmu Pertanian Indonesia*, 27(1), 120–131. <https://doi.org/10.18343/jipi.27.1.120>
- Abidin, Z., Cahyani, D. N. A., Pratiwi, A. H., Paramitha, A. I., Saepuddin, A., & Ishak, M. (2022). Persepsi Petani terhadap Pembuatan Pupuk Organik Cair (POC) (Studi Kasus; Dusun Nanasan, Desa Balesari, Kecamatan Ngajum, Kabupaten Malang). *I-Com: Indonesian Community Journal*, 2(1), 24–30. <https://doi.org/10.33379/icom.v2i1.1198>

- Adiwijaya, S., & Yovita. (2023). Pemberdayaan Masyarakat Melalui Inovasi Produk (Studi Pada Produk Anyaman Tanaman *Purun* Di Kota Palangka Raya). *Edunomika*, 8(1), 1–16.
- Asikin, S., & Thamrin, M. (2012). Manfaat *purun* tikus (*Eleocharis dulcis*) pada ekosistem sawah rawa. *Jurnal Penelitian Dan Pengembangan Pertanian*, 31(1), 35–42.
- Azni, U. S., Alfitri, Yunindyawati, Riswani, & Pellizzoni, L. (2023). Adaptive Capacity of Indonesian Peatland Communities Facing Resource Loss and Fires Threats: Studies on *Purun* (*Eleocharis dulcis*) Craftsmen. *International Journal of Design and Nature and Ecodynamics*, 18(5), 1223–1228. <https://doi.org/10.18280/IJDNE.180524>
- Bulkaini, Syamsuhaidi, Sutaryono, Y., Dahlanuddin, Fajariswana, Zuana, Maulana, Mutia S, Ardana P, & Parwati. (2022). Inovasi Teknologi Pembuatan Pupuk Organik Cair Berbasis Limbah Sabut Kelapa. *Jurnal Pengabdian Magister Pendidikan IPA*, 5(2), 204–208. <https://doi.org/10.29303/jpmipi.v5i2.1711>
- Chew, K. W., Chia, S. R., Yen, H.-W., Nomanbhay, S., Ho, Y.-C., & Show, P. L. (2019). Transformation of Biomass Waste into Sustainable Organic Fertilizers. *Sustainability*, 11(8), 2266. <https://doi.org/10.3390/su11082266>
- Ciceri, D., & Allannore, A. (2019). Local fertilizers to achieve food self-sufficiency in Africa. *Science of the Total Environment*, 648, 669–680. <https://doi.org/10.1016/j.scitotenv.2018.08.154>
- Efelina, V., Purwanti, E., Dampang, S., & Rahmadewi, R. (2018). Sosialisasi Pembuatan Pupuk Organik Cair Dari Batang Pohon Pisang Di Desa Mulyajaya Kecamatan Telukjambe Timur Kabupaten Karawang. *Senadimas*, 1(1), 357–359.
- Ellya, H., Mulyawan, R., & Rohmanna, N. A. (2020). Potential of Wetlands Plants as Organic Fertilizer. *Agrisains: Jurnal Budidaya Tanaman Perkebunan Politeknik Hasnur*, 6(01), 13–17. <https://doi.org/10.46365/agrs.v6i01.387>
- Hardiansyah, G., Junaidi, Yusro, F., Mariani, Y., Roslinda, E., Kusri, N., Diba, F., Oktoria, S., Erianto, Iskandar, Burhanuddin, Pranoto, D. Y. B., Ekawati, S., Silviani, Surati, Ramawati, Prasetyo, B. D., Handoyo, Charity, D., ... Nurdwiansyah, D. (2022). A study of sustainable peat cultivation implemented by the community of Tumbang Nusa Village, Central Kalimantan G. *IOP Conf. Series: Earth and Environmental Science*, 1025, 012005. <https://doi.org/10.1088/1755-1315/1025/1/012005>
- Irham, I., Nurhayati, A., Widada, A. W., Subejo, S., Devi, L. Y., Simarmata, R., Anantasari, E., Rosidah, A., & Anggraini, A. I. (2024). Farmer's willingness to accept the sustainable zoning-based organic farming development plan: A lesson from Sleman District, Indonesia. *Open Agriculture*, 9(1). <https://doi.org/10.1515/opag-2022-0253>
- Jaya, H. P., Ludang, Y., & Mangkoedihardjo, S. (2022). Development of traditional medicinal plants on Peatland conditions in Central Kalimantan. *Journal of Phytology*, 14, 24–30. <https://doi.org/10.25081/jp.2022.v14.7184>
- Kalalinggi, S. Y., Kumalasari, M. R., Beladona, S. U. M., Putra, R., & Pratika, R. A. (2024). Peningkatan Produktivitas Hasil Pertanian Melalui Pelatihan Pembuatan Pupuk Organik Cair dari Tanaman *Purun*. *Journal of Appropriate Technology for Community Services*, 6(1), 84–90. <https://doi.org/10.20885/jattec.vol6.iss1.art9>
- Khairullah, I., Indradewa, D., Maas, A., & Yudono, P. (2020). The Effect of Straw and *Purun* Tikus (*Eleocharis dulcis*) Compost to Rice Physiological Traits, Iron Toxicity and Grain Yield on Acid Sulfate Soils. *IOP Conference Series: Earth and Environmental Science*, 499(1). <https://doi.org/10.1088/1755-1315/499/1/012011>
- Korhikmah, Khamidah, N., & Sari, N. (2022). Pengaruh Dekomposer *Trichoderma harzianum*, *Trichoderma koningii*, dan *Trichoderma viridae* terhadap Kualitas Pupuk Organik Cair (POC) dari *Purun* Tikus (*Eleocharis dulcis*). *Agroekotek View*, Vol. 5(No. 1), 70–82.
- Ma'arif, I. B., Faizah, M., & Kumalasari, R. (2020). Workshop Pembuatan POC (Pupuk Organik Cair) pada Kelompok Tani Desa Mojokambang Kabupaten Jombang. *Jurnal Pengabdian Masyarakat Bidang Pertanian*, 1(1), 9–13. <https://ejournal.unwaha.ac.id/index.php/abdimasper/article/view/1015>
- Marlina, N., Aryani, I., Siti Aminah, I., Hawayanti, E., Yetty Zairani, F., Hasani, B., & Deny Yulianto, dan. (2022). Pemanfaatan Sampah Organik menjadi Pupuk Organik Cair di Kelurahan Karang Anyar Kota Palembang. *Altifani Journal: International Journal of Community Engagement*, 2(2), 73–77. <https://doi.org/10.32502/altifani.v2i2.4515>
- Martínez-Alcántara, B., Martínez-Cuenca, M. R., Bermejo, A., Legaz, F., & Quiñones, A. (2016). Liquid organic fertilizers for sustainable agriculture: Nutrient uptake of organic versus mineral fertilizers in citrus trees. *PLoS ONE*, 11(10), 1–20. <https://doi.org/10.1371/journal.pone.0161619>
- Nasution, Z., Adam, D. H., Rizal, K., & Triyanto, Y. (2024). The Effect of Liquid Organic Fertilizer Made from Eggshells and Sugarcane Bagasse on the Growth of Cayenne Pepper. *Jurnal Ekonomi*, 13(03), 83–92. <https://doi.org/10.54209/ekonomi.v13i03>
- Neneng, L., Anjalani, R., Saraswati, D., Angga, S. C., & Syaripin, S. (2022). Pemberdayaan Masyarakat Penambang Emas di Kalimantan Tengah melalui Inkubasi Bisnis Berbasis Pertanian dan Peternakan Terpadu. *Jurnal Ilmiah Kanderang Tingang*, 13(2), 213–223. <https://doi.org/10.37304/jikt.v13i2.173>
- Patunah, S., & Pradani, Z. E. (2024). Sustainable Agriculture to Support SDGs Through Innovation of Organic Fertilizer from Livestock Waste. *Journal of Agribusiness and Community Empowerment (JACE)*, 7(2), 110–117. <https://doi.org/10.32530/jace.v7i2.779>
- Riaz, U., Mehdi, S. M., Iqbal, S., Khalid, H. I., Qadir, A. A., Anum, W., Ahmad, M., & Murtaza, G. (2020). Bio-fertilizers: Eco-Friendly Approach for Plant and Soil Environment. In *Bioremediation and Biotechnology* (pp. 189–213).

- Springer International Publishing. https://doi.org/10.1007/978-3-030-35691-0_9
- Ruthena, Y., Anggoro, S., & Retnaning Soeprbowati, T. (2023). Diversity of Plankton Bio-indicators on Water Quality of Lutan Lake, Palangka Raya, Central Kalimantan, Indonesia. *E3S Web of Conferences*, 448, 03068. <https://doi.org/10.1051/e3sconf/202344803068>
- Sorooshian, S. (2024). The sustainable development goals of the United Nations: A comparative midterm research review. *Journal of Cleaner Production*, 453, 142272. <https://doi.org/10.1016/j.jclepro.2024.142272>
- Suharno, T., A., E.D., N., & S., Z. (2021). Kesiapan masyarakat untuk mengembangkan intensifikasi usahatani padi ladang pada lahan gambut di Desa Tuwung Kecamatan Kahayan Tengah Kabupaten Pulang Pisau Provinsi Kalimantan Tengah. *Jurnal AGRI PEAT*, 22(2), 111–118.
- Tamtomo, K. (2021). Unarticulated tensions in the marketization of organic agriculture: the case of pioneer organizations in Yogyakarta, Indonesia. *South East Asia Research*, 29(2), 195–213. <https://doi.org/10.1080/0967828X.2021.1931422>
- Wahdah, R., Habibah, & Safitri, N. (2023). Kualitas kompos dari biomassa gulma lahan rawa pasang surut. *EnviroScienteeae*, 19(3), 155–162.
- Wang, Y., Zhu, Y., Zhang, S., & Wang, Y. (2018). What could promote farmers to replace chemical fertilizers with organic fertilizers? *Journal of Cleaner Production*, 199, 882–890. <https://doi.org/10.1016/j.jclepro.2018.07.222>
- Warintan, S. E., Purwanigsih, P., Noviyanti, & Tethool, A. (2021). Pupuk Organik Cair Berbahan Dasar Limbah Ternak untuk Tanaman Sayuran. *Dinamisia : Jurnal Pengabdian Kepada Masyarakat*, 5(6), 1465–1471. <https://doi.org/10.31849/dinamisia.v5i6.5534>



Exploring local business opportunities: Entrepreneurship training to foster sustainable and resilient ventures di Angkatan Belia Islam-Permai Pulau Penang

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ABSTRACT

The local economic growth in Penang, Malaysia, demonstrates significant potential for the development of small and medium enterprises, particularly among the children of migrant workers. However, there remains a gap in understanding and entrepreneurial skills among the youth, which poses a challenge in creating sustainable and resilient ventures. This activity aims to provide entrepreneurship training that empowers the youth from the Angkatan Belia Islam-PERMAI to recognize and leverage local business opportunities. The methods used in this activity include interactive training sessions, case studies, and group discussions, designed to enhance participants' knowledge and entrepreneurial skills. The results of this activity indicate that participants experienced an increase in their understanding of entrepreneurial concepts and were able to identify business opportunities that fit the local context. Additionally, this activity also strengthened the social networks among participants, which is expected to support the development of their businesses in the future. Thus, this training contributes to the creation of more sustainable and resilient ventures among migrant youth in Penang.

Menjelajahi peluang bisnis lokal: Pelatihan kewirausahaan untuk mendorong usaha yang berkelanjutan dan tangguh di Angkatan Belia Islam-Permai Pulau Penang. Pertumbuhan ekonomi lokal di Pulau Penang, Malaysia, menunjukkan adanya potensi besar dalam pengembangan usaha kecil dan menengah, terutama di kalangan anak-anak pekerja migran. Namun, masih terdapat kesenjangan terkait pemahaman dan keterampilan kewirausahaan di kalangan remaja, yang menjadi tantangan dalam menciptakan usaha yang berkelanjutan dan tangguh. Kegiatan ini bertujuan untuk memberikan pelatihan kewirausahaan yang dapat memberdayakan anak remaja dari Angkatan Belia Islam-PERMAI, dalam mengenali dan memanfaatkan peluang bisnis lokal. Metode yang digunakan dalam kegiatan ini meliputi sesi pelatihan interaktif, studi kasus, dan diskusi kelompok, yang dirancang untuk meningkatkan pengetahuan dan keterampilan kewirausahaan peserta. Hasil dari kegiatan ini menunjukkan bahwa peserta mengalami peningkatan pemahaman tentang konsep kewirausahaan, serta mampu mengidentifikasi peluang bisnis yang sesuai dengan konteks lokal. Selain itu, kegiatan ini juga memperkuat jaringan sosial di antara peserta, yang diharapkan dapat mendukung pengembangan usaha mereka di masa depan. Dengan demikian, pelatihan ini berkontribusi pada penciptaan usaha yang lebih berkelanjutan dan tangguh di kalangan remaja pekerja migran di Pulau Penang.

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INTRODUCTION

The development of local entrepreneurship is one of the key strategies in creating an independent and resilient society, particularly among youth groups facing social and economic challenges (Bernardi, 2018; Al-Qudah, 2022; Turyakira, et.al., 2024; Mariyono, 2024). The development of local entrepreneurship not only supports individual independence but also creates new economic opportunities that directly impact community growth (Farrukh, et.al., 2018; Najjinda, et.al., 2024; Aman, et.al., 2024). By utilizing local resources and existing potential, communities can reduce their dependence on external parties and enhance their capacity to endure the dynamics of global economic changes. Moreover, entrepreneurship that develops at the local level often has significant social impacts, such as reducing unemployment rates, empowering vulnerable groups, and fostering innovations that address the needs of the surrounding community (Tillmar, et.al, 2021; Lladós & Ruiz, 2022). For teenagers, involvement in entrepreneurship can be an effective means of self-development, fostering skills such as leadership, decision-making, and social responsibility, making them better prepared to face future challenges (Hintikka, et.al., 2022; Brush, et.al., 2024).

The Angkatan Belia Islam community, under the auspices of the PERMAI Foundation (Pertubuhan Masyarakat Indonesia), represents a group with significant potential for development. This community consists of teenagers ranging from elementary to high school age, most of whom are children of Indonesian migrant workers (TKI) in Malaysia. Some of them are unable to access formal education and rely solely on informal education provided by the Foundation due to various challenges. This situation creates an urgent need to offer training programs that equip them with practical skills to help build a better future (Tjitrawati & Romadhona, 2024).

The phenomenon of migrant workers in various countries shows a similar pattern, where children often become a vulnerable group due to limited access to formal education, healthcare services, and social protection (Cai, et.al, 2019; Nguyen, 2023; Huang, et.al., 2024). Many migrant workers face economic situations that force them to bring their families to the destination country (Zhang & Zhang, 2017; Farashah & Blomquist, 2020). However, due to their often limited legal status or challenging working conditions, their children's access to educational facilities and personal development opportunities is severely limited (Farashah & Blomquist, 2020).

In many countries, children of migrant workers often find themselves in a legal gray area, where they are ineligible for social benefits, such as free education or welfare services, due to the lack of official documentation (Farashah & Blomquist, 2021; Elviandri & Shaleh, 2022). This situation makes them dependent on local communities or non-governmental organizations to gain access to education or basic skills training. In addition, difficult socio-economic conditions force some children to work and help support their families, further limiting their opportunities for optimal development (Elviandri & Shaleh, 2022).

This reality creates a young generation often trapped in a cycle of poverty and dependency. The lack of formal education and practical skills makes it challenging for them to compete in an increasingly skills-driven labor market (Farashah & Blomquist, 2021; Rotimi, et.al., 2023). As a result, many can only access low-paying jobs or are even exposed to the risks of exploitation and human trafficking (Li & Luo, 2021; Farashah & Blomquist, 2021; Rotimi, et.al., 2023). However, this reality also presents an opportunity to make a significant impact through community-based interventions, such as entrepreneurship training, vocational education, and life skills development (Nguyen, 2023; Li, 2024). By providing children of migrant workers with access to these programs, they can not only develop their own potential but also become agents of change for their communities. This effort requires cross-sector collaboration, involving the government, community organizations, and the business sector to create an environment that supports their empowerment holistically.

This community service program is designed to explore local business opportunities and provide entrepreneurship training to the community. The training focuses not only on delivering basic knowledge about entrepreneurship but also integrates a local opportunity-based approach to create sustainable and resilient ventures. The novelty of this program lies in the integration of entrepreneurial approaches with the exploration of local business potentials. The program not only prepares participants to start small businesses but also encourages them to leverage local resources available in their surroundings, such as culture-based Indonesian products or traditional foods with market value.

In addition, this program directly supports the achievement of several Sustainable Development Goals (SDGs). This program contributes to SDG 1 (No Poverty) by providing skills training that can create business opportunities to improve participants' living standards (Celone, et.al., 2022; Hamad, et.al., 2023; Nicolò, et.al., 2023). This program also supports SDG 4 (Quality Education) through an informal education approach that focuses on practical skills. Moreover, the program contributes to SDG 8 (Decent Work and Economic Growth) by fostering local economic growth through entrepreneurship (Ebekozién, et.al., 2024), As well as SDG 10 (Reduced Inequalities) by providing training access to marginalized youth groups who face challenges in accessing formal education (Haque, et.al., 2020; Ma, et.al., 2022; Subramony & Rosenbaum, 2024; Kabir, et.al., 2024).

Through this initiative, it is expected that the children of the Angkatan Belia Islam community will not only acquire practical skills but also develop self-confidence and independence. This program serves as a significant first step in empowering the youth generation with limited access to education, enabling them to contribute to local economic development, both in Malaysia and in Indonesia in the future. With an innovative approach based on local needs, this

program delivers a tangible and sustainable impact, creating relevant solutions to the socio-economic challenges faced by this community.

The novelty of this community service program also lies in its local-based approach, which integrates the exploration of business potential with entrepreneurship training. Unlike typical entrepreneurship activities that often focus on theory or generic simulations, this program is designed to leverage the resources, culture, and unique needs of the Angkatan Belia Islam community. Participants are encouraged to explore business opportunities relevant to their local context, such as creating culturally-based Indonesian handicrafts or developing simple culinary ventures that cater to local tastes in Malaysia. This approach provides more contextual solutions, not only equipping participants with skills but also helping them understand the dynamics of the local market where they live.

A few researchers have focused on the role of entrepreneurship in empowering youth, especially within economically disadvantaged groups (Brush, et.al., 2024; Turyakira, et.al., 2024). There have also been various studies highlighting the challenges faced by children of migrant workers in accessing formal education and the importance of community-based support systems (Farashah & Blomquist, 2021; Elviandri & Shaleh, 2022; Nguyen, 2023). However, there have been limited studies concerned with integrating informal entrepreneurship education tailored specifically for marginalized youth with limited legal status—especially those in transnational settings such as Indonesian migrant communities in Malaysia. Additionally, most existing programs tend to focus on either entrepreneurship theory or general vocational skills without aligning with the unique socio-cultural and economic context of the target community.

Therefore, this community service initiative intends to fill this gap by developing an inclusive, locally-adapted entrepreneurship training program that combines informal education, interactive experience-based learning methods, and the direct exploration of local business opportunities. The objectives of this program are to (1) provide practical entrepreneurial skills to marginalized youth within the Angkatan Belia Islam community, (2) promote self-reliance and socio-economic inclusion, and (3) establish a replicable model for community development through collaborative partnerships involving local foundations and higher education institutions.

METHOD

The method used in this activity is the Participatory Rural Appraisal (PRA) method combined with practice-based training (*experiential learning*) (Trisnowati, et.al., 2021; Cornet, et.al., 2024; Trisnowati, et.al., 2024; Rayyani, et.al., 2024). The following are the detailed steps of the method implemented:

Initial Observation and Identification through Interviews and Focus Group Discussions (FGD)

The observation aims to understand the conditions of the Angkatan Belia Islam community under the PERMAI Foundation, including social and economic challenges, as well as local business opportunities. Initial observation and identification are also intended to understand the community's environment and identify local resources that can be utilized as business opportunities.

Interactive Entrepreneurship Training

This training aims to provide participants with basic entrepreneurial knowledge and practical skills. The participants are teenagers under the guidance of the Angkatan Belia Islam organization, totaling 27 individuals. They range in age from 13 to 20 years old. The steps we implemented include the following:

- 1) Providing basic materials by the team through presentations on entrepreneurship, which include:
 - a) The definition of entrepreneurship.
 - b) Creative and innovative thinking.
 - c) Strategies for recognizing business opportunities.
- 2) Practical simulation (Business Simulation Game):
 - a) Participants are divided into small groups to simulate the process of starting a business.
 - b) Each group selects a business idea from the previous discussion and designs a business concept, including the product, target market, and marketing strategy.
 - c) The groups then present their business concepts and receive feedback from the team and the foundation's management.

Evaluation and Reflection

Evaluation is carried out by the community service team to assess the success of the training and formulate follow-up actions. The evaluation steps conducted are as follows:

- 1) The PKM team prepares a simple questionnaire to measure the participants' level of understanding before and after the training.
- 2) Participants fill out a simple questionnaire to evaluate their level of understanding before and after the training.
- 3) A final discussion is held to gather impressions, opinions, and expectations from the participants regarding the training.

Overall, the stages in the implementation of this community service program are outlined as in Figure 1.

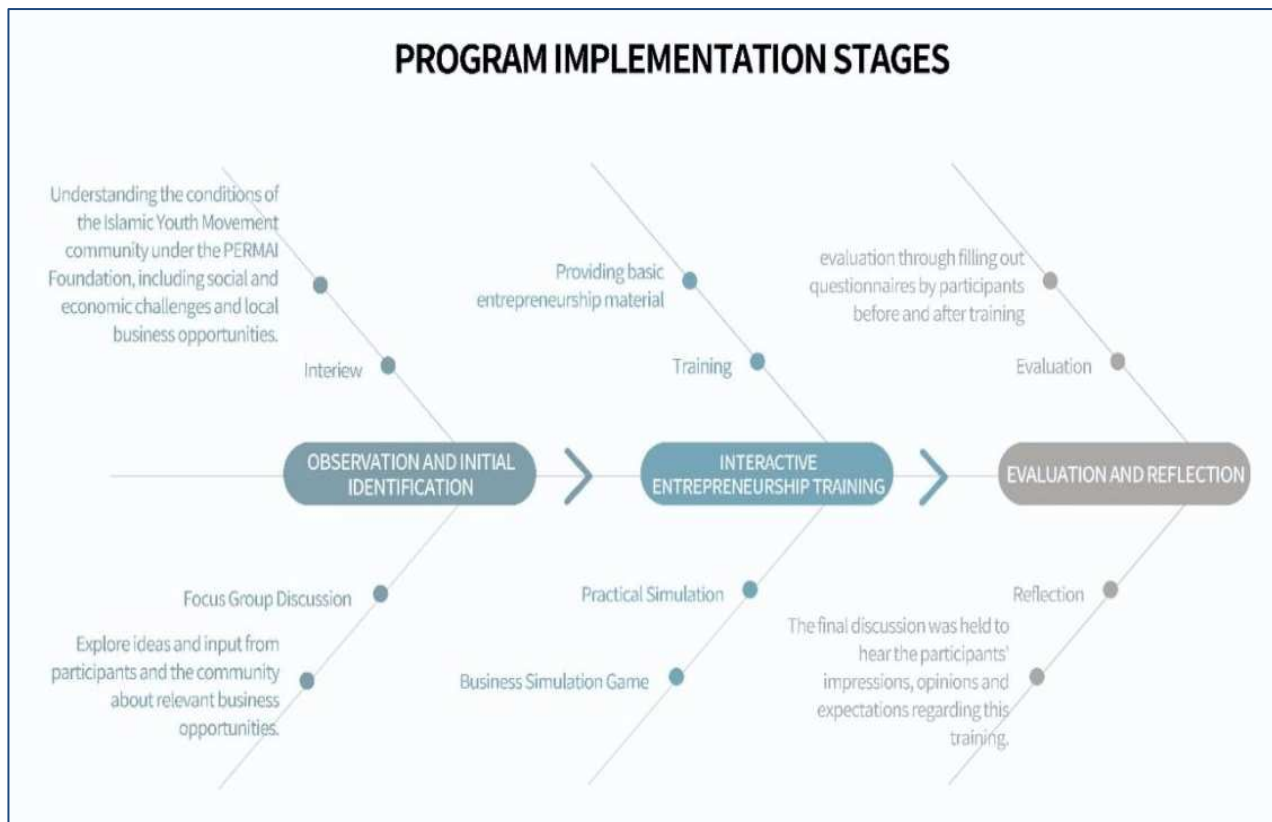


Figure 1. Stages in the Implementation of the Community Service Program

With this method, the activities not only focus on providing materials but also actively engage participants in the learning process, allowing them to feel involved and capable of applying the training outcomes in real life. This program is expected to serve as a foundation for ongoing, routine entrepreneurship training within the community.

RESULTS AND DISCUSSION

This community service activity is carried out with three main approaches: observation and initial identification, interactive entrepreneurship training, and evaluation and reflection. The results from each method provide a clear picture of the impact of this program on the participants.

Observation and Initial Identification

Our observation was conducted via online Zoom meetings with the foundation and the management of Angkatan Belia Islam. Two Zoom meetings were held, which went smoothly in terms of interviews and Focus Group Discussions attended by the community service team, foundation management, and mentors from Angkatan Belia Islam to understand the needs and potentials that could be developed. Through the interviews and FGD, the discussion focused on three main topics, namely: An overview of the participants in the activity and the need for entrepreneurship training.

Initial identification to measure the participants' interest and knowledge about entrepreneurship was conducted by providing a simple pre-test via Google Form (questionnaire) shared with the 27 participants online. The distribution of the Google Form was assisted by mentors from Angkatan Belia Islam.

The initial identification (see Table 1) through the pre-test with the online Google Form revealed that most participants had limited knowledge of entrepreneurship (only 5%), although they showed interest in potentially starting a business in the future (30%). Additionally, a low motivation factor was observed due to a lack of understanding of how to start and manage a business. The pre-test also revealed significant ignorance regarding the fundamentals of entrepreneurship. Therefore, it is crucial to ensure that the training program is tailored to meet the diverse needs and backgrounds of the participants. These results indicate that before the training begins, a deeper approach is needed to explore the participants' aspirations and readiness to pursue entrepreneurship. By identifying this, the training program is focused on providing practical, basic knowledge about entrepreneurship and accessible ways to start a business.

Table 1. Initial Observation

Activity	Participants	Objective	Results Achieved
Interview via Online Zoom	Community Service Team, Foundation Management, and Community Mentors	Understanding the conditions of the Angkatan Belia Islam community under the PERMAI Foundation, including social, economic challenges, and local business opportunities.	In-depth information about the participants' characteristics, local potential, and the challenges they face, such as access to formal education and limited skills.
Focus Group Discussion (FGD)	Community Service Team, Foundation Management, and Community Facilitators		A list of training needs (particularly entrepreneurial soft skills) to prepare the participants.

The initial questionnaire we distributed online via Google Forms to 27 participants identified that 30% of participants showed interest in entrepreneurship, and 95% of participants did not know how to start a business (only 5% had some knowledge about entrepreneurship). Table 2 is the results based on the initial observation through the pre-test (online questionnaire) and after the training through the post-test (questionnaire distributed in person):

Table 2. Comparison of Achievements Before and After Training

Before Training	Achievement	After Training	Achievement
Interest in entrepreneurship	30%	Interest in entrepreneurship	85%
Ignorance about how to start a business	95%	Knowledge of how to start a business	95%

The result of this observation is that we were able to gather in-depth information about the participants' characteristics, local potential, and the challenges they face, such as access to formal education and limited skills.

Interactive Entrepreneurship Training

At this stage, the interactive entrepreneurship training is conducted using group discussions, case studies, and presentations from successful young entrepreneurs. The training focuses on developing practical skills such as business planning, basic financial management, and marketing strategies for small businesses. Additionally, participants are also involved in a simulation of creating a business plan, which they present in front of the group.

As a result, most participants showed an increased understanding of entrepreneurial concepts. They were able to formulate simple business ideas and understand the basic steps to start a business. At the end of the session, some participants expressed their desire to try starting a small business after the training (Figure 2 and Figure 3).



Figure 2. Interactive Training



Figure 3. Practical Simulation

The interactive training successfully sparked the participants' entrepreneurial spirit and improved their understanding of the business world. The case-based approach and direct interaction teaching proved effective in providing a clearer picture of the challenges and opportunities in entrepreneurship. This demonstrates that the method was able to address the participants' knowledge limitations at the beginning of the program (Table 3).

Table 3. Interactive Training

Activity	Sub Activity	Participants	The Results Achieved
Training	Entrepreneurship definition Creative and innovative thinking Strategy for identifying business opportunities	27	80% of participants were able to formulate business ideas
Practical Simulation (Business Simulation Game)	Dividing participants into 5 groups Each group selects a business idea from the previous discussion and designs a business concept, including the product, target market, and marketing strategy Each group presented their business concept and received feedback from the team and the foundation's management	27	70% of participants feel ready to try starting a small business after the training

As shown in the table above, it can be concluded that the result of this interactive training is an increase in the participants' understanding of entrepreneurship, as well as the emergence of various creative and potential business concepts.

Evaluation and Reflection

The final stage of this activity is evaluation and reflection. Evaluation is conducted by collecting feedback from participants through a questionnaire distributed directly (post-test) to measure the effectiveness of the training. The results of the evaluation show that 100% of participants felt they gained useful knowledge about entrepreneurship, while 90% felt more motivated to try entrepreneurship (Table 4). Additionally, participants' personal reflections revealed an increase in self-confidence and a deeper understanding of their entrepreneurial potential in the future.

The evaluation shows that the training successfully achieved its goal of increasing participants' knowledge and motivation. The reflection results indicate a significant change in attitude, where participants are now more confident in facing entrepreneurial challenges. However, there are still challenges in providing further understanding of the resources and support available for young entrepreneurs. Therefore, follow-up and additional guidance are needed to ensure that the entrepreneurial spirit developed can be realized in the form of actual businesses.

Table 4. Evaluation and Reflection Results

No.	Indicator	Results (%)	Description
1.	Motivated to Start a Business	90%	Participants showed a significant increase in motivation to start and run a business
2.	Gained Useful Knowledge	100%	Participants feel they gained new insights and practical information that can be applied in business.
3.	Readiness to Face Challenges	80%	Participants feel more confident and ready to face challenges in the business world.
4.	Increased Self-Confidence	78%	Participants feel more confident in making entrepreneurial decisions.
5.	Satisfaction with the Training Program	92%	Participants are satisfied with the approach, material, and training methods provided.

The Table 4 reflects the evaluation of various aspects after the program concluded, with an emphasis on motivation, knowledge, and readiness of the participants. The results of the evaluation and reflection show that the participants demonstrated an increase in understanding, teamwork skills, and confidence to start small businesses.

The three methods applied—initial observation and identification, interactive entrepreneurship training, and evaluation and reflection—have successfully had a positive impact on the participants. They not only gained practical knowledge about entrepreneurship but also felt more motivated to pursue their goals in the business world. However, sustainability and further support are essential to ensure that this entrepreneurial spirit can be realized in practice. The Table 5 shows the success achieved through each method applied, with clear success indicators for each step.

Table 5. Success Achieved from Each Stage of the Activity

Method	Success Achieved	Success Indicators
Observation and Initial Identification	Identifying the needs and level of understanding of participants regarding entrepreneurship	• 85% of participants showed interest in entrepreneurship. • 95% of participants know how to start a business.
Interactive Entrepreneurship Training	Improving participants' practical understanding of entrepreneurship and providing basic skills to start a business	• 80% of participants are able to formulate business ideas. • 70% of participants feel ready to try starting a small business after the training.
Evaluation and Reflection	Increase participants' motivation and self-confidence to start their own business	• 90% of participants feel more motivated to become entrepreneurs. • 100% of participants feel they have gained valuable knowledge.

These findings align with recent studies emphasizing the importance of experiential learning in entrepreneurship education. According to Nabi et al. (2023), hands-on activities such as simulations, group discussions, and problem-solving scenarios contribute significantly to the development of entrepreneurial competencies among youth. The interactive methods used in this program not only transferred knowledge but also built confidence and a sense of agency in participants—key attributes in transforming intention into actual business creation. Furthermore, participants' reflections revealed a shift from passive learners to proactive individuals who are willing to explore opportunities and take calculated risks, indicating the strong potential of community-based training models.

Moving forward, sustainability of entrepreneurial spirit among youth requires consistent support systems, including mentorship, access to startup resources, and institutional partnerships. As emphasized by OECD (2022), entrepreneurship ecosystems that support young entrepreneurs through incubation, funding access, and networking platforms play a crucial role in ensuring long-term success. Therefore, the outcomes of this program serve as an initial spark, but must be followed by structured follow-up programs. Establishing collaborative mentorship between institutions, such as universities and NGOs, with youth groups like Angkatan Belia Islam, can ensure continuity and scalability of such impactful initiatives.

CONCLUSION

The community service activity successfully had a positive impact in fostering entrepreneurial spirit and skills among the youth of Angkatan Belia Islam. This program not only identified the participants' needs but also enhanced their understanding, skills, and motivation to pursue entrepreneurship. Through an interactive approach and real-life experience, participants demonstrated the ability to design business ideas and confidence to start a business. The high levels of motivation and knowledge felt by participants serve as indicators of the program's success in providing them

with the foundation needed to enter the world of entrepreneurship. The success of this activity highlights the importance of organizing entrepreneurship education programs that focus on developing practical skills, motivation, and self-confidence for young generations, which has the potential to create a long-term impact in building a stronger entrepreneurial ecosystem.

The implications of this activity show that interactive and real-life experience-based entrepreneurship education programs have great potential to foster entrepreneurial spirit and skills among the younger generation. With participants able to formulate business ideas and feeling motivated to start their ventures, this program acts as a catalyst in creating new entrepreneurs who can contribute to economic growth in the future. Additionally, this success indicates the need for the continuity of similar programs, such as providing ongoing mentoring to help participants implement their business ideas. Support from various parties, including local entrepreneurs, educational institutions, and the government, will strengthen the long-term impact of this program. With a holistic approach involving training, mentoring, and access to resources, it is hoped that more young generations will be empowered to drive change through innovative and sustainable entrepreneurship.

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REFERENCES

- Aman, R., Elo, M., Ahokangas, P. and Zhang, X. (2024), "Empowering migrant women's entrepreneurship: stakeholder perspectives from the entrepreneurial ecosystem", *International Journal of Entrepreneurial Behavior & Research*, Vol. 30 No. 7, pp. 1698-1724. <https://doi.org/10.1108/IJEBR-04-2023-0425>
- Al-Qudah, A.A., Al-Okaily, M. and Alqudah, H. (2022), "The relationship between social entrepreneurship and sustainable development from economic growth perspective: 15 'RCEP' countries", *Journal of Sustainable Finance and Investment*, Vol. 12 No. 1, pp. 44-61, doi:10.1080/20430795.2021.1880219.
- Bernardi, M. (2018), "Millennials, sharing economy and tourism: the case of Seoul", *Journal of Tourism Futures*, Vol. 4 No. 1, pp. 43-56. <https://doi.org/10.1108/JTF-12-2017-0055>
- Brush, C., Wraae, B. and Nikou, S. (2024), "Understanding influences on entrepreneurship educator role identity", *Education + Training*, Vol. 66 No. 10, pp. 1-28. <https://doi.org/10.1108/ET-01-2022-0007>
- Cai, J., Guonan, D. and Yuan, L. (2019), "Measurement of the real urbanization level in China and its international comparison", *China Political Economy*, Vol. 2 No. 2, pp. 287-317. <https://doi.org/10.1108/CPE-10-2019-0018>
- Celone, A., Cammarano, A., Caputo, M. and Michelino, F. (2022), "Is it possible to improve the international business action towards the sustainable development goals?", *Critical Perspectives on International Business*, Vol. 18 No. 4, pp. 488-517. <https://doi.org/10.1108/cpoib-08-2020-0122>
- Cornet, S., Barpanda, S., Guidi, M.-A.D. and Viswanathan, P.K. (2024), "Sustainability education and community development in higher education using participatory and case based approaches in India", *International Journal of Sustainability in Higher Education*, Vol. 25 No. 9, pp. 94-110. <https://doi.org/10.1108/IJSHE-07-2022-0242>
- Ebekozien, A., Aigbavboa, C.O., Samsurijan, M.S., Thwala, W.D. and Ahmed, M.A.H. (2024), "The role of apprenticeship in skills development of construction artisans to achieving Sustainable Development Goal 8: stakeholders' unexplored approach", *Engineering, Construction and Architectural Management*, Vol. 31 No. 13, pp. 411-429. <https://doi.org/10.1108/ECAM-06-2024-0714>
- E. Elviandri, and A. I. shaleh, "Perlindungan Pekerja Migran Indonesia Di Masa Adaptasi Kebiasaan Baru Di Provinsi Jawa Tengah," *Jurnal Pembangunan Hukum Indonesia*, vol. 4, no. 2, pp. 245-255, May. 2022. <https://doi.org/10.14710/jphi.v4i2.245-255>
- Farashah, A.D. and Blomquist, T. (2020), "Exploring employer attitude towards migrant workers: Evidence from managers across Europe", *Evidence-based HRM*, Vol. 8 No. 1, pp. 18-37. <https://doi.org/10.1108/EBHRM-04-2019-0040>
- Farashah, A. and Blomquist, T. (2021), "Organizational culture and cultural diversity: an explorative study of international skilled migrants in Swedish firms", *Journal of Global Mobility*, Vol. 9 No. 2, pp. 289-308. <https://doi.org/10.1108/JGM-11-2020-0072>

- Farrukh, M., Alzubi, Y., Shahzad, I.A., Waheed, A. and Kanwal, N. (2018), "Entrepreneurial intentions: The role of personality traits in perspective of theory of planned behaviour", *Asia Pacific Journal of Innovation and Entrepreneurship*, Vol. 12 No. 3, pp. 399-414. <https://doi.org/10.1108/APJIE-01-2018-0004>
- Hamad, S., Lai, F.W., Shad, M.K., Khatib, S.F.A. and Ali, S.E.A. (2023), "Assessing the implementation of sustainable development goals: does integrated reporting matter?", *Sustainability Accounting, Management and Policy Journal*, Vol. 14 No. 1, pp. 49-74. <https://doi.org/10.1108/SAMPJ-01-2022-0029>
- Haque, M.N., Saroar, M., Fattah, M.A., Morshed, S.R. and Fatema, N. (2022), "Access to basic services during the transition from MDGs to SDGs: more rhetoric than reality in a Bangladesh slum", *Journal of Humanities and Applied Social Sciences*, Vol. 4 No. 1, pp. 57-75. <https://doi.org/10.1108/JHASS-08-2020-0127>
- Hintikka, J., Taipale-Erävala, K., Lehtinen, U. and Eskola, L. (2023), "Let's be entrepreneurs – Finnish youth's attitudes toward entrepreneurship", *Journal of Enterprising Communities: People and Places in the Global Economy*, Vol. 17 No. 4, pp. 856-874. <https://doi.org/10.1108/JEC-07-2021-0099>
- Huang, L., Jiao, C. and Liu, Q. (2024), "Taxation and entrepreneurship of migrant workers: evidence from China", *China Agricultural Economic Review*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/CAER-02-2024-0043>
- Kabir, M.R., Tania, I.J. and Rubel, M.A.K. (2024), "Social innovation for inclusion and sustainable development: a case study on BRAC institute of skills development (BISD)", *IIMBG Journal of Sustainable Business and Innovation*, Vol. 2 No. 2, pp. 81-101. <https://doi.org/10.1108/IJSBI-12-2023-0064>
- Li, H. (2024), "The influence of non-cognitive ability on the wage of rural migrant workers", *International Journal of Manpower*, Vol. 45 No. 3, pp. 639-660. <https://doi.org/10.1108/IJM-03-2023-0128>
- Li, X. and Luo, L. (2021), "Migration patterns and migrant workers' consumption", *China Agricultural Economic Review*, Vol. 13 No. 4, pp. 781-798. <https://doi.org/10.1108/CAER-08-2020-0197>
- Llados-Masllorens, J. and Ruiz-Dotras, E. (2022), "Are women's entrepreneurial intentions and motivations influenced by financial skills?", *International Journal of [Gender and Entrepreneurship]*, Vol. 14 No. 1, pp. 69-94. <https://doi.org/10.1108/IJGE-01-2021-0017>
- Nabi, G., Linan, F., & Fayolle, A. (2023). Experiential Entrepreneurship Education and its Role in Fostering Entrepreneurial Intentions. *Journal of Small Business Management*.
- Ma, H., Zhang, Y.C., Butler, A., Guo, P. and Bozward, D. (2022), "Entrepreneurial performance of new-generation rural migrant entrepreneurs in China", *International Journal of Entrepreneurial Behavior & Research*, Vol. 28 No. 2, pp. 412-440. <https://doi.org/10.1108/IJEBr-07-2020-0456>
- Mariyono, D. (2024), "Multicultural values: meeting point of two forces in developing Islamic education", *Quality Education for All*, Vol. 1 No. 1, pp. 46-69. <https://doi.org/10.1108/QEA-02-2024-0018>
- Najjinda, S., Akileng, G., Bagire, V. and Turyakira, P. (2024), "Entrepreneurial resources and the well-being of women entrepreneurs in the hospitality industry of Uganda", *Asia Pacific Journal of Innovation and Entrepreneurship*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/APJIE-06-2024-0133>
- Nguyen Thi Ngoc, T. (2023), "An exploration of drivers of livelihoods of documented but low-skilled return migrant workers in Vietnam during the COVID-19 pandemic crisis", *International Journal of Development Issues*, Vol. 22 No. 3, pp. 301-324. <https://doi.org/10.1108/IJDI-02-2023-0039>
- Nicolò, G., Zanellato, G., Tiron-Tudor, A. and Tartaglia Polcini, P. (2023), "Revealing the corporate contribution to sustainable development goals through integrated reporting: a worldwide perspective", *Social Responsibility Journal*, Vol. 19 No. 5, pp. 829-857. <https://doi.org/10.1108/SRJ-09-2021-0373>
- OECD. (2022). Policy Brief on Youth Entrepreneurship: Building a Youth Entrepreneurship Ecosystem. OECD Publishing.
- Rayyani, W.O., Idrawahyuni, Nia Wahyuni, Silviana Salam. 2024. Strengthening The Role of Villages Through Participatory Rural Appraisal Method to Achieve Sustainable Development Goals. *Jurnal Masyarakat Mandiri Universitas Muhammadiyah Mataram* Vol. 8 No. 3 3074-3087. e-ISSN 2614-5758 | p-ISSN 2598-8158 DOI: <https://doi.org/10.31764/jmm.v8i3.21943> link journal address <http://journal.ummat.ac.id/index.php/jmm>
- Rotimi, J.O.B., Ramanayaka, C.D.E., Olatunji, O.A. and Rotimi, F.E. (2023), "Migrant construction workers' demography and job satisfaction: a New Zealand study", *Engineering, Construction and Architectural Management*, Vol. 30 No. 3, pp. 1122-1145. <https://doi.org/10.1108/ECAM-05-2021-0457>
- Samad, Y.M., et.al. 2023. Prevention and Addressing Non-Procedural Indonesian Migrant Worker Practices (PMI-NP) Through A Strategic Intelligence Approach. *Jurnal Lemhanas RI* Vol. 11 No. 4. E-ISSN: 2830-5728
- Subramony, M. and Rosenbaum, M.S. (2024), "SDG commentary: economic services for work and growth for all humans", *Journal of Services Marketing*, Vol. 38 No. 2, pp. 190-216. <https://doi.org/10.1108/JSM-05-2023-0201>
- Tillmar, M., Ahl, H., Berglund, K. and Pettersson, K. (2022), "Neo-liberalism translated into preconditions for women entrepreneurs – two contrasting cases", *Journal of Enterprising Communities: People and Places in the Global Economy*, Vol. 16 No. 4, pp. 603-630. <https://doi.org/10.1108/JEC-12-2020-0207>
- Tjitrawati, A.T. and Romadhona, M.K. (2024), "Living beyond borders: the international legal framework to protecting rights to health of Indonesian illegal migrant workers in Malaysia", *International Journal of Migration, Health and Social Care*, Vol. 20 No. 2, pp. 227-245. <https://doi.org/10.1108/IJMHS-04-2023-0038>

- Trisnowati, H., Ismail, D., Padmawati, R.S. and Utarini, A. (2021), "Developing a framework for youth empowerment to prevent smoking behavior in a rural setting: study protocol for a participatory action research", *Health Education*, Vol. 121 No. 1, pp. 30-47. <https://doi.org/10.1108/HE-06-2020-0045>
- Trisnowati, H., Ahsan, A. and Kramer, E. (2024), "Youth empowerment in tobacco control: community-based participatory research in rural Indonesia", *Health Education*, Vol. 124 No. 5/6, pp. 221-242. <https://doi.org/10.1108/HE-05-2023-0050>
- Turyakira, P., Sendawula, K., Nanyanzi, M., Nantale, H. and Tamale, J.N. (2024), "Social entrepreneurship: empirical evidence on its contribution to the realization of the sustainable development goals in Uganda", *Journal of Work-Applied Management*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/JWAM-02-2023-0011>
- Zhang, X. and Zhang, J. (2017), "Managing Migrant Workers and Urban Spatial Planning", *Open House International*, Vol. 42 No. 3, pp. 29-34. <https://doi.org/10.1108/OHI-03-2017-B0007>



Training and assistance in the preparation of teaching modules based on technological pedagogical content knowledge (TPACK) for science teachers in Pali District

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-12-04 Revised: 2025-04-03 Accepted: 2025-04-07 Published: 2025-04-22 Keywords TPACK Teacher Training Knowledge Enhancement	This activity aims to provide science teachers in PALI district with insights into Technological Pedagogical Content Knowledge (TPACK)-based learning, train them in the preparation of teaching modules, and assist them in designing TPACK-based learning. The training method consists of four stage: preliminary study, workshop implementation, mentoring, and evaluation. Evaluation through pre-test, post-test, and participant feedback showed a significant increase in teachers' understanding of TPACK. The research results show an increase occurred in all aspects, namely Pedagogical Knowledge (PK) from 3.48 to 3.89, Content Knowledge (CK) from 3.45 to 3.99, Technological Knowledge (TK) from 3.22 to 3.86, Pedagogical Content Knowledge (PCK) from 3.27 to 3.90, Technological Content Knowledge (TCK) from 3.00 to 3.87, Technological Pedagogical Knowledge (TPK) from 3.18 to 3.83, and overall TPACK from 3.12 to 3.89. In conclusion, this activity proved effective in improving teachers' skills in developing and implementing TPACK-based teaching modules. This training needs to be carried out continuously in order to develop teachers' TPACK in the learning process.
Kata Kunci TPACK Pelatihan Guru Peningkatan Pengetahuan	Pelatihan dan pendampingan penyusunan modul ajar berbasis technological pedagogical content knowledge (TPACK) bagi guru-guru IPA di Kabupaten Pali. Kegiatan ini bertujuan untuk memberikan wawasan kepada guru-guru IPA di Kabupaten PALI mengenai pembelajaran berbasis Technological Pedagogical Content Knowledge (TPACK), melatih mereka dalam penyusunan modul ajar, serta mendampingi mereka dalam merancang pembelajaran berbasis TPACK. Metode pelatihan terdiri dari empat tahapan: studi pendahuluan, pelaksanaan workshop, pendampingan, dan evaluasi. Evaluasi melalui pre-test, post-test, dan umpan balik peserta menunjukkan peningkatan signifikan pada pemahaman guru terkait TPACK. Peningkatan terjadi pada seluruh aspek, yaitu Pedagogical Knowledge (PK) dari 3.48 menjadi 3.89, Content Knowledge (CK) dari 3.45 menjadi 3.99, Technological Knowledge (TK) dari 3.22 menjadi 3.86, Pedagogical Content Knowledge (PCK) dari 3.27 menjadi 3.90, Technological Content Knowledge (TCK) dari 3.00 menjadi 3.87, Technological Pedagogical Knowledge (TPK) dari 3.18 menjadi 3.83, serta keseluruhan TPACK dari 3.12 menjadi 3.89. Kesimpulannya, kegiatan ini terbukti efektif dalam meningkatkan keterampilan guru dalam menyusun dan mengimplementasikan modul ajar berbasis TPACK.

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INTRODUCTION

In a new era, the rapid globalization and evolution of digital technology bringing significant changes. The changing times always demand changes in all fields, including education. Technological advances are actually in accordance with the progress of human civilization which raises a series of new challenges that need to be addressed carefully and

systematically. These changes have an impact on the demands for the quality of education and will certainly have an impact on the quality of teacher education (Anwar et al., 2024).

As a form of adaptation to change, various innovations have been carried out. The latest innovations can emerge from various sources but to improve the learning process the teachers themselves are able to change it (Wulandari et al., 2023). A teacher must be able to innovate with new things. Innovation can not only be obtained through formal education, but can also be obtained through trainings to support continuous professional improvement (Kalyani & Rajasekaran, 2018). The professional development of teachers must take place continuously and throughout life, at least from the time of the student until the end of his professional career. The development of technology requires teachers to innovate to be able to present learning that utilizes technology. Therefore, teachers must master technology and have the competence to utilize technology in learning. The ability of teachers to design and implement learning is influenced by 3 components, namely content mastery, pedagogy and technology (Koehler et al., 2015). The integration of these three components is called TPACK.

Based on the results of a survey of teachers who participated in the PPG program in office, the reality is that in the field almost 90% of teachers have not been innovative, their TPACK ability is still very minimal, this problem is raised in this study. Teachers tend to be busy with teaching without paying attention to the technology, content and pedagogy they acquired while in formal education (Tondeur et al., 2019); (Lixia & Choi, 2024). As has been assessed by several researchers, the use of technology variants in learning is still very few. Minimal use of technology shows that digital literacy is still lacking (Guggemos & Seufert, 2021) which of course affects teachers' Technological Pedagogical Content Knowledge (TPACK) ability. TPACK's ability is greatly influenced by digital literacy (Pondee et al., 2021); Pehlevan & Ünal, 2024); Fahadi & Khan 2022); Backfisch et al., 2021)). TPACK is a development of PCK that has been better known before, as a key element of the learning process (Anwar et al., 2016; Irwanto 2021; Nilsson, 2024), by adding technological elements to TPACK (Mishra et al., 2016).

TPACK serves as a useful conceptual framework for thinking, analyzing, and evaluating that teachers must know in order to integrate technology into teaching, but ultimately TPACK must be understood as a framework for how best teachers develop this integrated knowledge (Ling Koh et al., 2014); Sihombing et al., 2021). As with PCK, of course, TPACK's ability will also develop, referring to the results of research that has been conducted previously that a teacher's PCK will develop with experience, the development pattern can be categorized into three categories of PCK, namely Pre PCK, Growing PCK and Maturing PCK (Anwar et al., 2014). Based on these findings, TPACK's capabilities can also be categorized and improved. As it was concluded by number of experts that TPACK's ability can be improved (Lachner et al., 2021); Kasi et al., 2022). TPACK of good teachers will affect the quality of teacher teaching which of course has an impact on improving student learning outcomes and will further affect the quality of education. Therefore, it is necessary to provide training and assistance to teachers in designing learning in teaching modules based on technological pedagogical content knowledge.

The teaching module designed is a teaching module based on TPACK so that teachers can apply the right strategies and technology related to the content of the material to be taught. Related to the above, the target audience in this activity is a group of Science Teachers in the Junior High School Education unit in PALI district Based on initial observations, the information that teachers have about TPACK-based learning is still limited. This is possible because many teachers do not follow the development of technology and study the characteristics of the material and the learning methods/models that will be applied. Geographically, PALI district is one of the districts in South Sumatra that has a long distance from training centers such as those in the national and provincial capitals.

This training activity will involve lecturers in accordance with their fields. In addition, this activity will also involve students who take it as a form of student MBKM activities. Thus, it is very important to carry out this service activity in the form of training and assistance in the preparation of differentiated learning-based teaching modules in the Independent Curriculum. The chosen learning phase is phase D in the subject of Natural Sciences because it is at the teaching level in Junior High School. This training activity should be carried out continuously because it supports the Sustainable Development Goals (SDGs) achievement program, especially goal number four regarding improving the quality of education (Aina et al., 2023; Camilleri & Camilleri, 2020). Sustainable and continuous professional development equips teachers with up-to-date pedagogical strategies and technological skills, which are essential in adapting to the evolving demands of 21st-century education (Srivastava, 2023). Moreover, embedding the TPACK framework into teacher training enhances their ability to integrate technology meaningfully into the curriculum, thereby fostering inclusive and

equitable quality education (Hamzah et al., 2024; Zaenab et al., 2024). This activity can improve teacher competence in teaching, especially in integrating Content, pedagogy and technology.

METHOD

The method carried out in this service uses four stages, which are as follows:

Phase I, Preliminary Study.

At this stage, the activities carried out by the service team include:

- Conduct a literature study to examine problems that will be solved through service activities.
- Conducting data collection in the form of interviews and distributing questionnaires about teachers' knowledge about differentiated teaching modules in the Independent Curriculum
- Preparation of training materials by the facilitator.

Phase II, Implementation.

At this stage, a series of training activities were carried out consisting of:

- Workshop on the preparation of TPACK-based teaching modules. At this stage, teachers are given knowledge and understanding first about the teaching module and its criteria then about the teaching module for TPACK-based
- The facilitator will train teachers' skills in preparing lesson plans in the form of TPACK-based learning teaching modules. This activity is intended so that teachers can get experience and feedback on the material during the simulation.

Phase III, Assistance and Guidance.

At this stage, the activities carried out are:

- Fostering and assisting teachers on an ongoing basis in the preparation of TPACK-based teaching modules
- Guiding teachers in schools

The detailed scheme of implementation of the activity method can be seen in Figure 2 below:

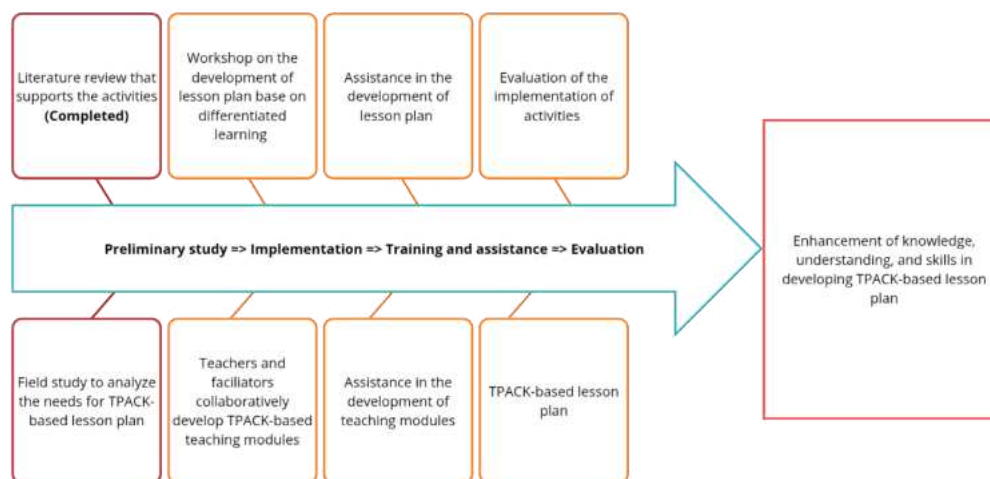


Figure 1. Scheme for the implementation of activity methods

Target Audience of Service

The target audience in this service activity is 20 junior high school teachers who are members of MGMP OKU Selatan. Through this activity, the target audience is expected to be able to:

- Producing pedagogic and professional skills of teachers in preparing learning tools in the form of differentiated learning-based teaching modules in the Independent Curriculum which ultimately supports the learning process of students in acquiring knowledge
- Produce learning facilitators from teachers so that teachers who have participated in training can teach or transfer the knowledge and skills they have acquired through training to other teachers in schools.

Evaluation Design

At this stage, the activities carried out are:

- Monitoring

- b. Conduct an evaluation
- c. Conducting follow-up efforts from the results of the evaluation.

The evaluation was carried out through:

1. Pre-test and Post-test related to TPACK-based Teaching and Learning Module materials
2. Task for the Preparation of TPACK-based Teaching Modules in Phase D (Junior High School Level) for Natural Sciences.
3. Questionnaire of participant feedback on training materials and programs. The questionnaire grid of trainees' understanding of the training material can be seen in Table 3. The questionnaire grid of feedback of trainees on training activities can be seen in Table 4.

The activity observation sheet is used as an observation reference in knowing the shortcomings during the implementation of service. The results of this observation sheet are then analyzed, the reasons and causes of this to ultimately plan a service solution in the future.

Table 3. Table of Trainees' Understanding of Training Materials

No	Aspects	Score	Interpretation
1.	Teachers' knowledge and understanding of the phases and learning outcomes to design teaching modules	3	Good
		2	Enough
		1	Less
2.	Teachers' knowledge and understanding of the objectives and flow of learning objectives to design teaching modules	3	Good
		2	Enough
		1	Less
3.	Teachers' knowledge and understanding of differentiated learning	3	Good
		2	Enough
		1	Less
4.	Teachers' knowledge and understanding of TPACK-based teaching modules	3	Good
		2	Enough
		1	Less

Table 4. Questionnaire Grid of Trainees' Feedback on Training

Aspects	Indicator	Highest Response	Average
Quality of Material Delivery by Resource Persons			
Mastery of the Material	5= Very Good, 4= Good, 3=Enough, 2= Not Good, 1= Very Bad		
Delivery	5= Very Good, 4= Good, 3=Enough, 2= Not Good, 1= Very Bad		
Training Programs			
Suitability of Training Themes	5= Very Good, 4= Good, 3=Enough, 2= Not Good, 1= Very Bad		
Fun Training Atmosphere	5= Very Good, 4= Good, 3=Enough, 2= Not Good, 1= Very Bad		
Experience gained	5= Very Good, 4= Good, 3=Enough, 2= Not Good, 1= Very Bad		

The grid of pretest and posttest evaluation sheets is presented in the Appendix section. The activity observation sheet is used as an observation reference in knowing the shortcomings during the implementation of service. The results of this observation sheet are then analyzed, the reason for this to finally plan a service solution in the future. The table of assessment categories according to (Arikunto, 2006) is as follows:

Table 5. Categories Assessment

Range	Category
80-100	Very good
66-79	Good
56-65	Enough
40-55	Less
30-39	Fail

RESULTS AND DISCUSSION

Training and mentoring activities

Before entering the training materials and activities, teachers are asked to take a pre-test to determine their initial abilities.



Figure2. Training and mentoring activities

The teachers involved were explained about TPACK and its importance in learning, and then the teachers were given examples of TPACK-based teaching modules and analyzed sample documents. Furthermore, the teachers were guided to make a TPACK-based teaching module; the activity lasted for seven hours, and then the teachers were asked to complete their teaching modules at their respective homes for one week, which was followed by exposure to the results and

corrected directly the following week. The exposure activity lasted several days, considering that the implementation time took quite a long time for each teacher.

Respondent Demographic Profile

The data below was obtained through the distribution of questionnaires to respondents (Riyanti et al., 2023), namely junior high school science teachers in PALI district. The identity of teachers who are respondents in service can be seen in the table.

Table 6. Respondent's Profile

No.	Initial	Age	Teaching Experience	Alumni	Institution
1.	A	45 Tahun	21 Tahun	Univ. Muhammadiyah Palembang	SMPN 2 Penukal
2.	ADP	24 Tahun	02 Tahun	UIN Raden Fatah Palembang	SMP YPIP Talang Ubi
3.	AF	26 Tahun	05 Tahun	S1 Pendidikan Fisika Unsri	SMPN 4 Penukal
4.	AP	37 Tahun	06 Tahun	Universitas Sriwijaya Pend. Fisika	SMPN 8 Talang Ubi
5.	AEP	23 Tahun	02 Tahun	Universitas Sriwijaya	SMP YKPP Pendopo
6.	BT	29 Tahun	07 Tahun	Pend. Fisika STKIP Surya Tangerang	SMPN 11 Talang Ubi
7.	DN	31 Tahun	10 Tahun	Univ. Muhammadiyah Palembang	SMPN 6 Penukal
8.	EK	47 Tahun	20 Tahun	Univ. Muhammadiyah Palembang	SMPN 3 Penukal
9.	EM	54 Tahun	27 Tahun	Universitas Sriwijaya	SMPN 2 Penukal
10.	EN	33 Tahun	08 Tahun	Universitas Ahmad Dahlan	SMPN 5 Talang Ubi
11.	ES	39 Tahun	18 Tahun	FKIP Biologi Muhammadiyah Palembang	SMPN 10 Talang Ubi
12.	EN	45 Tahun	10 Tahun	MIPA Kimia Unsri	SMPN 13 Talang Ubi
13.	HS	30 Tahun	05 Tahun	Univ. PGRI Palembang	SMPN 3 Talang Ubi
14.	IS	30 Tahun	05 Tahun	S1 FKIP Fisika Univ. PGRI Palembang	SMPN 1 Talang Ubi
15.	IH	29 Tahun	05 Tahun	S1 Pend. Kimia Univ. Lampung	SMPN 7 Penukal
16.	KS	28 Tahun	04 Tahun	Univ. Muhammadiyah Palembang	SMP YPIP Talang Ubi
17.	M	54 Tahun	32 Tahun	UT	SMPN 13 Talang Ubi
18.	NS	24 Tahun	01 Tahun	UIN Raden Fatah Palembang	SMP PGRI Talang Ubi
19.	N	31 Tahun	09 Tahun	S1 FKIP Fisika Unsri	SMPN 6 Talang Ubi
20.	P	32 Tahun	04 Tahun	Universitas Sriwijaya	SMPN 2 Talang Ubi
21.	RS	46 Tahun	19 Tahun	S1 Pertanian Universitas Sriwijaya	SMPN 9 Talang Ubi
22.	RNW	27 Tahun	04 Tahun	Univ. Muhammadiyah Palembang	SMPN 7 Talang Ubi
23.	SDY	35 Tahun	12 Tahun	FKIP Pend. Biologi Universitas Sriwijaya	SMPN 4 Talang Ubi
24.	TY	41 Tahun	19 Tahun	Univ. Muhammadiyah Palembang	SMPN 12 Talang Ubi
25.	YM	43 Tahun	19 Tahun	FKIP Fisika Univ. PGRI Palembang	SMPN 1 Penukal
26.	Y	39 Tahun	10 Tahun	Pendidikan Kimia UNSRI	SMPN 5 Penukal

Questionnaire Data Analysis (Pre-Test and Post-Test)

The initial stage to find out the teacher's TPACK ability is the distribution of questionnaires to junior high school science teachers. The initial questionnaire is carried out in the form of Pre-Test and the final questionnaire is carried out in the form of Post-test. The questionnaire consisted of 33 questions consisting of 6 statements for the Pedagogical Knowledge aspect, 4 statements for the Content Knowledge aspect, 7 statements for the Technological Knowledge aspect, 7 statements for the Pedagogical Content Knowledge aspect, 2 statements for the Technological Content Knowledge aspect, 4 statement items for the Technological Pedagogical Knowledge aspect, and 3 statement items for the Technological Pedagogical and Content Knowledge aspect.

Table 7. Results of TPACK Ability Questionnaire Analysis for Junior High School Science Teachers in PALI Regency

TPACK Indicators	PRE-TEST	Criteria	POST-TEST	Criteria
PK	3,48	Good	3,89	Good
CK	3,45	Good	3,99	Good
TK	3,22	Enough	3,86	Good
PCK	3,27	Enough	3,90	Good
TCK	3,00	Enough	3,87	Good
TPK	3,18	Enough	3,83	Good
TPACK	3,12	Enough	3,89	Good

From the results of table 7 which contains the results of the questionnaire and interpretation of the Pre-Test and Post-Test for seven aspects of TPACK. It can be seen in the table that there is an increase in scores in each of the existing aspects. Based on this, it indicates good results with training in improving the TPACK ability of junior high school science teachers in PALI Regency.

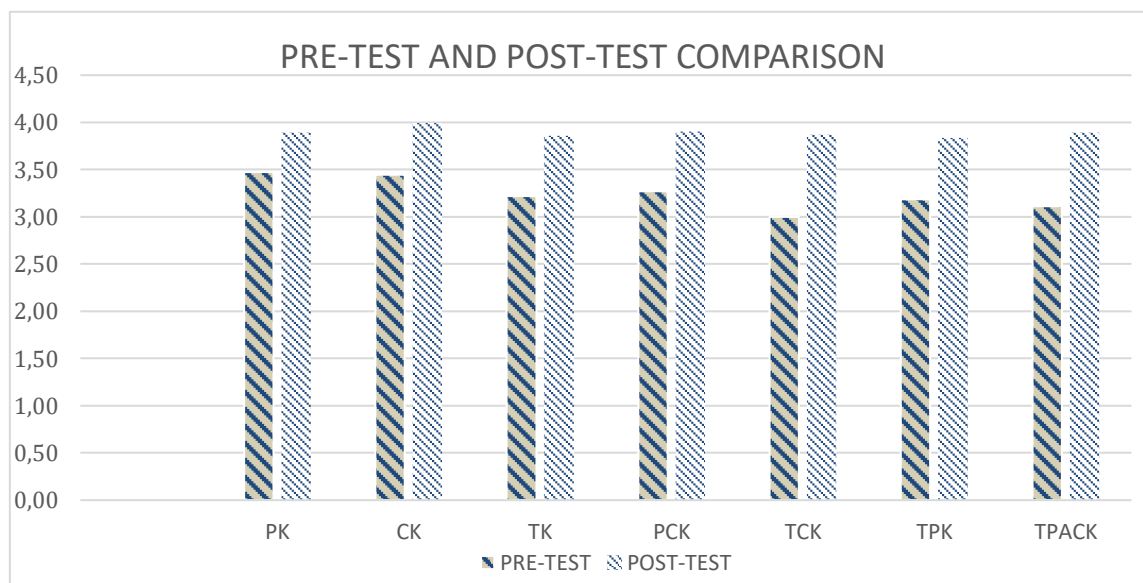


Figure 3. Comparison Diagram of Pre-Test and Post-Test

Figure 2 shows that there is a different and very significant comparison. These differences show that each aspect has an increase in the results of the questionnaire scores obtained.

The benefits obtained include improving teachers' pedagogic and professional skills in preparing TPACK-based teaching modules. The increase in knowledge, understanding and ability of teachers in compiling TPACK-based teaching modules, and through this activity is also expected to ultimately have an impact on students so that students can also be able to follow the era of technological advancement in the field of education (Anwar, 2018).

At the initial stage of the activity, namely a preliminary study with the distribution of a questionnaire in the form of measuring the teacher's TPACK ability which is considered a Pre-Test. The Pre-Test is seen to see the knowledge and ability of teachers towards TPACK. The results of the Pre-Test were obtained that the number of each aspect had the criteria of Medium. Each of these aspects consists of PK with an average of 3.48 with Good criteria, CK with an average of 3.45 with Good criteria, TK with an average of 3.22 with Medium criteria, PCK with an average of 3.27 with Medium criteria, TCK with an average of 3.00 with medium criteria, TPK with an average of 3.18 with medium criteria, and TPACK with an average of 3.12 with moderate criteria. This shows that the ability and knowledge of junior high school science teachers in PALI is still minimal. Therefore, it is necessary to have training and preparation of TPACK-based teaching modules to improve teacher competence (Anwar et al., 2024; Chai et al., 2013; Dong et al., n.d.; Koh et al., 2017). After the Pre-Test stage is carried out, it will be continued to prepare the material from the activity.

At the implementation stage, this workshop aims to provide teachers with an in-depth understanding of the preparation of teaching modules, especially those based on the TPACK (Technological Pedagogical Content Knowledge) approach. Teachers will be given basic knowledge about the concept of teaching modules, including the criteria that must be met in their preparation. In addition, they will also be introduced to the principles of TPACK-based teaching modules, which effectively integrate technology, pedagogy, and content in the learning process. The TPACK approach has been shown to improve teachers' competence in integrating educational technology, which in turn improves student engagement and learning outcomes. Furthermore, teacher training that focuses on TPACK development enables teachers to be more effective in designing and implementing online and blended learning (Philipsen et al., 2019); (Lisa et al., 2021). Furthermore, the Mentoring and Guidance Stage, the facilitator will train the teachers' skills in designing a lesson plan using TPACK-based teaching modules. In this activity, teachers will have the opportunity to practice directly, prepare teaching modules, and conduct learning simulations. The goal is for teachers to gain practical experience and constructive

feedback (Khairani et al., 2024), so that they can improve their competence in compiling and implementing TPACK-based teaching modules in the classroom.

In the Mentoring and Guidance stage, several digital platforms were introduced to support TPACK-based learning. These platforms include Google groups which are commonly used in learning to carry out online discussions. Through Google Groups, teachers can hold discussion forums that allow students to interact, exchange ideas, and complete assignments collaboratively, supporting the TPACK approach by integrating technology in teaching and learning activities (Papanikolaou et al., 2017; Benson & Ward, 2013; Mutiara Nabilah et al., 2023). In addition, there are google sites which are a medium in integrating technology for learning devices. By leveraging Google Sites, teachers can organize learning materials in a format that is easily accessible to students, including teaching modules, assignments, and other resources. This allows the creation of an E-Learning platform that supports distance and hybrid learning, providing flexibility for students to learn anytime and anywhere (Liu & Yu, 2023); (Mujianto & Suryadhianto, 2025).

At the evaluation stage in this training program, it will be carried out through several methods. The post-test will be used to measure the final understanding of junior high school science teachers in PALI regarding TPACK-based teaching and learning module materials. Second, participants will be given the task of compiling a TPACK-based teaching module in Phase D (junior high school level) with a focus on Natural Science subjects. This task aims to apply the theory that has been learned in the form of real practice. In addition, participants will also be asked to fill out a feedback questionnaire related to training materials and programs. This questionnaire will be used to evaluate the level of understanding of participants in the material presented, as well as provide input on the effectiveness and quality of training.

The results of the Post-Test show that there is an improvement in aspects of TPACK. This increase can be seen from the results of the data, namely each of these aspects consists of PK with an average of 3.89 with Good criteria, CK with an average of 3.99 with Good criteria, Kindergarten with an average of 3.86 with good criteria, PCK with an average of 3.90 with good criteria, TCK with an average of 3.87 with good criteria, TPK with an average of 3.83 with good criteria, and TPACK with an average of 3.89 with good criteria. This shows that the training carried out has a good effect on the ability of junior high school science teachers in PALI. It is hoped that through this training teachers can improve their teaching methods which will have an impact on improving student achievement, which of course will improve the quality of the teaching and learning process in the classroom (Bakri et al., 2021). Structured and sustainable teacher training has been proven to strengthen teachers' pedagogical competence and professionalism in managing learning (Darling-Hammond et al., 2017). Increasing teaching and learning activities in the classroom shows an increase in the quality of education, which is one of the Sustainable Development Goals (SDGs), namely improving quality education, which is the fourth goal of the SDGs. Organizing inclusive, quality, and equal education to be accessible to everyone, and supporting lifelong learning opportunities for everyone

CONCLUSION

Training and assistance in the preparation of TPACK-based teaching modules for junior high school science teachers in PALI Regency has improved teachers' ability to design more modern and effective learning. Training and mentoring carried out in a sustainable manner will certainly have a better influence on TPACK teachers. The results of the Pre-Test and Post-Test showed improvements in all aspects of TPACK, including pedagogical knowledge, content, and technology. This means that the training has successfully helped teachers understand and use the TPACK approach well in classroom learning.

In addition, the introduction of digital platforms such as Google Groups and Google Sites helps teachers integrate technology in learning effectively. By using this platform, teachers can create more interactive and flexible learning, which will have an impact on students.

REFERENCES

- Aina, M., Kadir, D., Sappaile, B. I., Aswan, D. M., & Al Mufida, A. (2023). Analysis of the Implementation of ESD in online science learning during the Covid-19 pandemic. *Jurnal Penelitian Pendidikan IPA*, 9(6), 4395–4401. <https://doi.org/10.29303/jppipa.v9i6.3818>
- Anwar, Y. (2018). Enhancing the prospective Biology teachers' Pedagogical Content Knowledge (PCK) through a peer coaching based model. *Journal of Physics: Conference Series*, 1022(1), 1–7. <https://doi.org/10.1088/1742-6596/1022/1/012059>

- Anwar, Y., Riyanti, S., & Dewi, S. P. (2024). TPACK profile of biology teachers in the industrial revolution 4.0 era. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, 10(3), 1020–1033. <https://doi.org/10.22219/jpbi.v10i3.37006>
- Anwar, Y., Rustaman, N. Y., Widodo, A., & Indonesia, U. P. (2016). Perkembangan kemampuan pedagogical content knowledge the development of pedagogical content knowledge (PCK). *Cakrawala Pendidikan*, 35(3), 349–356. <https://doi.org/http://dx.doi.org/10.21831/cp.v35i3.8251>
- Anwar, Y., Rustaman, N. Y., Widodo, A., & Redjeki, S. (2014). Kemampuan pedagogical content knowledge guru Biologi yang berpengalaman dan yang belum berpengalaman. *Jurnal Pengajaran Matematika dan Ilmu Pengetahuan Alam*, 19(1), 69. <https://doi.org/10.18269/jpmipa.v19i1.426>
- Backfisch, I., Scherer, R., Siddiq, F., Lachner, A., & Scheiter, K. (2021). Teachers' technology use for teaching: Comparing two explanatory mechanisms. *Teaching and Teacher Education*, 104, 1–16. <https://doi.org/10.1016/j.tate.2021.103390>
- Bakri, F., Permana, H., Fitriani, W., Ambarwulan, D., & Mulyati, D. (2021). The development of 21st century skills and competence in service teacher through TPACK training workshop. *AIP Conference Proceedings*, 2320(March). <https://doi.org/10.1063/5.0037612>
- Benson, S. N., & Ward, C. L. (2013). Teaching with technology: Using TPACK to understand teaching expertise in online higher education. *Journal of Educational Computing Research*, 48(2), 153–172. <https://doi.org/10.2190/EC.48.2.c>
- Camilleri, M. A., & Camilleri, A. C. (2020). The sustainable development goal on quality education. *CSR, Sustainability, Ethics and Governance*, 261–277. https://doi.org/10.1007/978-3-030-21154-7_13
- Chai, C.-S. S., Koh, J. H.-L., & Tsai, C.-C. (2013). A Review of technological pedagogical content knowledge. *In Educational Technology & Society (Vol. 16, Issue 2)*.
- Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). Effective teacher professional development. *Learning Policy Institute*, 1–8.
- Dong, Y., Chai, C. S., Hwee, J., & Koh, L. (n.d.). Exploring the profiles and interplays of pre-service and in-service teachers' technological pedagogical content knowledge (TPACK) in China. <https://www.researchgate.net/publication/281698171>
- Fahadi, M., & Khan, M. S. H. (2022). Technology-enhanced Teaching in Engineering Education: Teachers' Knowledge Construction Using TPACK Framework. *International Journal of Instruction*, 15(2), 519–542. <https://doi.org/10.29333/iji.2022.15229a>
- Guggemos, J., & Seufert, S. (2021). Teaching with and teaching about technology – Evidence for professional development of in-service teachers. *Computers in Human Behavior*, 115, 106613. <https://doi.org/10.1016/j.chb.2020.106613>
- Hamzah, F., Abdullah, A. H., & Ma, W. (2024). Advancing education through technology integration, innovative pedagogies and emerging trends: A Systematic Literature Review. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, 41(1), 44–63. <https://doi.org/10.37934/araset.41.1.4463>
- Irwanto, I. (2021). Research trends in technological pedagogical content knowledge (TPACK): A systematic literature review from 2010 to 2021. *European Journal of Educational Research*, 10(3), 1199–1213. <https://doi.org/https://doi.org/10.12973/eu-jer.10.4.2045>
- Kalyani, D., & Rajasekaran, K. (2018). Innovative teaching and learning. *Journal of Applied and Advanced Research*, 3, S23–S25. <https://doi.org/https://dx.doi.org/10.21839/jaar.2018.v3S1.162>
- Kasi, Y. F., Widodo, A., Samsudin, A., & Riandi, R. (2022). The benefits of teacher professional development (TPD) program based on partnership, technology, and ethnoscience approach to improving the TPACK of science teachers. *Pedagonal: Jurnal Ilmiah Pendidikan*, 6(2), 228–237. <https://doi.org/10.55215/pedagonal.v6i2.5756>
- Khairani, J., Hanifati, S., & Azzahra, S. (2024). Program Pendidikan profesi guru (PPG) dalam peningkatan kompetensi profesional guru. *Cemara Journal*, 2(1), 78–87.
- Koehler, M. J., Mishra, P., & Cain, W. (2015). What Is technological pedagogical content knowledge (TPACK)? *Virtualidad, Education y Ciencia*, 6(10), 9–23.
- Koh, J. H. L., Chai, C. S., & Lim, W. Y. (2017). Teacher professional development for TPACK-21CL. *Journal of Educational Computing Research*, 55(2), 172–196. <https://doi.org/10.1177/0735633116656848>
- Lachner, A., Fabian, A., Franke, U., Preiß, J., Jacob, L., Führer, C., Küchler, U., Paravicini, W., Randler, C., & Thomas, P. (2021). Fostering pre-service teachers' technological pedagogical content knowledge (TPACK): A quasi-experimental field study. *Computers and Education*, 174(August), 1–14. <https://doi.org/10.1016/j.compedu.2021.104304>
- Ling Koh, J. H., Chai, C. S., & Tay, L. Y. (2014). TPACK-in-Action: Unpacking the contextual influences of teachers' construction of technological pedagogical content knowledge (TPACK). *Computers and Education*, 78, 20–29. <https://doi.org/10.1016/j.compedu.2014.04.022>
- Lisa, A., Faridi, A., Bharati, D. A. L., & Saleh, M. (2021). A TPACK-in practice model for enhancing EFL students' readiness to teach with Ed-Tech apps. *International Journal of Interactive Mobile Technologies*, 15(17), 156–176. <https://doi.org/10.3991/ijim.v15i17.23465>

- Liu, M., & Yu, D. (2023). Towards intelligent E-learning systems. *Educational and Information Technologies*, 28, 7845–7876. <https://doi.org/https://doi.org/10.1007/s10639-022-11479-6>
- Lixia, W., & Choi, L. J. (2024). TPACK and EdTech integration in teaching and learning process: A Systematic literature review (2014-2024). *Communications on Applied Nonlinear Analysis*, 31(7s), 487–505. <https://doi.org/https://doi.org/10.52783/cana.v31.1381>
- Mishra, P., Herring, M., & Koehler, M. (2016). Handbook of technological pedagogical content knowledge for Educators. *In Handbook of Technological Pedagogical Content Knowledge (TPACK) for Educators: Second Edition*. <https://doi.org/10.4324/9781315771328>
- Mujianto, H., & Suryadhianto, U. (2025). Transformation of learning systems with a hybrid approach based on information technology. *Santhet: Jurnal Sejarah, Pendidikan dan Humaniora*, 9(1), 94–104. <https://doi.org/10.36526/js.v3i2.5007>
- Mutiara Nabilah, T., Anwar, Y., Ilir, O., Selatan, S., Kunci, K., Ipa, G., & Menengah Pertama, S. (2023). Kemampuan technological pedagogical and content knowledge guru IPA SMP: Studi literature review. *Jurnal Pendidikan IPA*, 12(2), 118–125. <https://doi.org/10.20961/inkuiri.v12i2.73712>
- Nilsson, P. (2024). From PCK to TPACK - Supporting student teachers' reflections and use of digital technologies in science teaching. *Research in Science and Technological Education*, 42(3), 553–577. <https://doi.org/10.1080/02635143.2022.2131759>
- Papanikolaou, K., Makri, K., & Roussos, P. (2017). Learning design as a vehicle for developing TPACK in blended teacher training on technology enhanced learning. *International Journal of Educational Technology in Higher Education*, 14(1), 1–14. <https://doi.org/10.1186/s41239-017-0072-z>
- Pehlevan, İ., & Ünal, B. (2024). Investigating the relationship between digital literacy and TPACK levels of pre-Service english teachers. *Journal of Language Education and Research*, 10(1), 87–111. <https://doi.org/10.31464/jlere.1432879>
- Philipsen, B., Tondeur, J., Roblin, N. P., Vanslambrouck, S., & Zhu, C. (2019). Improving teacher professional development for online and blended learning: A systematic meta- aggregative review Authors. *Education Tech Research*, 67, 1145–1174. <https://doi.org/https://doi.org/10.1007/s11423-019-09645-8>
- Pondee, P., Panjaburee, P., & Srisawasdi, N. (2021). Preservice science teachers' emerging pedagogy of mobile game integration: a tale of two cohorts improvement study. *Research and Practice in Technology Enhanced Learning*, 16(1). <https://doi.org/10.1186/s41039-021-00152-0>
- Riyanti, S., Yenny Anwar, dan, Ilir, O., & Selatan, S. (2023). Tinjauan metode dan instrumen: TPACK terhadap pengukuran calon guru dalam pendidikan. *Jurnal Pendidikan IPA*, 12(2), 110–117. <https://doi.org/10.20961/inkuiri.v12i2.73723>
- Sihombing, R. A., Manurung, G. A., & Simanjuntak, L. A. (2021). Analysis of implementation of TPACK by teachers through distance learning at junior high school in Medan. *ISER (Indonesian Science Education Research)*, 3(2). <https://doi.org/10.24114/iser.v3i2.31235>
- Srivastava, M. S. (2023). The Evolution of Education: Navigating 21st-century challenges. *International Journal For Multidisciplinary Research*, 5(5), 1–9. <https://doi.org/10.36948/ijfmr.2023.v05i05.6314>
- Tondeur, J., Scherer, R., Siddiq, F., & Baran, E. (2019). Strategies to prepare pre-service teachers for Technological Pedagogical Content Knowledge (TPACK): A mixed-method study. *Educational Technology Research and Development*, 68(1), 319–343. <https://doi.org/https://doi.org/10.1007/s11423-019-09692-1>
- Wulandari, R. I., Munip, A., & Mawardi, A. C. (2023). Tantangan profesionalisme guru: Integrasi pembelajaran pada kurikulum merdeka dengan pendidikan di abad 21. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 8(3), 2650–2667. <https://doi.org/https://doi.org/10.23969/jp.v8i3.11029>
- Zaenab, Z., Samsudi, S., Wahyudin, A., & Hidayah, I. (2024). Enhancing TPACK for excellent vocational teachers: The role of teacher engagement in implementing the merdeka curriculum. *Journal of Ecohumanism*, 3(8), 4476–4510. <https://doi.org/https://doi.org/10.62754/joe.v3i8.5098>



Empowering physics educators through technology-based teaching material workshops: A teachers' perspective

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ARTICLE INFO	ABSTRACT
Article history Received: 2025-01-26 Revised: 2025-04-03 Accepted: 2025-04-07 Published: 2025-04-22 Keywords Physics Education STEM Technology Integration Teaching Materials Teacher's Workshop	<i>Integrating technology into physics education is critical in preparing students with 21st-century skills. However, many physics teachers in Indonesia face challenges, including limited access to technological tools, insufficient training, and low confidence in using technology. This study aimed to explore the perspectives of physics teachers on a workshop designed to empower them in developing technology-based teaching materials. The workshop, held in Bandung Barat, provided hands-on training on integrating various technologies, such as Augmented Reality, Physics Mobile, Live Worksheets, and Articulate Storylines, into physics teaching. Data were collected from 51 participating teachers using a descriptive survey method through structured questionnaires. Results indicated high satisfaction across four evaluated aspects: material comprehension (mean score: 4.29), relevance and benefits (4.15), implementation and facilitation (4.17), and outcomes and impacts (4.20). Teachers perceived an increase in their confidence and readiness to create innovative teaching materials, though some required additional time and support for mastery. This study highlights workshops' significance in bridging the gap between technology and education. It emphasizes the need for sustained training programs and collaboration among educators, policymakers, and technology developers to enhance the quality of STEM-based physics education in Indonesia.</i>
Kata Kunci Pendidikan fisika STEM Integrasi Teknologi Bahan Pembelajaran Workshop Guru	Memberdayakan guru fisika melalui workshop bahan pembelajaran berbasis teknologi: Perspektif guru. Mengintegrasikan teknologi dalam pendidikan fisika sangat penting untuk mempersiapkan siswa dengan keterampilan abad ke-21. Namun, banyak guru fisika di Indonesia menghadapi tantangan, termasuk keterbatasan akses terhadap alat teknologi, pelatihan yang tidak memadai, dan rendahnya kepercayaan diri dalam menggunakan teknologi. Penelitian ini bertujuan untuk mengeksplorasi perspektif guru fisika terhadap sebuah workshop yang dirancang untuk memberdayakan mereka dalam mengembangkan bahan ajar berbasis teknologi. Workshop yang diselenggarakan di Bandung Barat ini memberikan pelatihan praktis tentang integrasi berbagai teknologi, seperti Augmented Reality, Physics Mobile, Live Worksheets, dan Articulate Storylines, dalam pembelajaran fisika. Data dikumpulkan dari 51 guru yang berpartisipasi menggunakan metode survei deskriptif melalui kuesioner terstruktur. Hasil penelitian menunjukkan tingkat kepuasan yang tinggi pada empat aspek yang dievaluasi: pemahaman materi (skor rata-rata: 4,29), relevansi dan manfaat (4,15), pelaksanaan dan fasilitasi (4,17), serta hasil dan dampak (4,20). Guru merasakan peningkatan dalam kepercayaan diri dan kesiapan mereka untuk membuat materi pengajaran yang inovatif, meskipun beberapa memerlukan waktu dan dukungan tambahan untuk penguasaan. Penelitian ini menyoroti pentingnya workshop dalam menjembatani kesenjangan antara teknologi dan pendidikan. Penelitian ini juga menekankan perlunya program pelatihan berkelanjutan serta kolaborasi antara pendidik, pembuat kebijakan, dan pengembang teknologi untuk meningkatkan kualitas pendidikan fisika berbasis STEM di Indonesia.

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INTRODUCTION

STEM (Science, Technology, Engineering, Mathematics)-based education has become a significant focus in various countries to address the challenges of the 21st century (Akudugu & Abagale, 2024). This approach aims to integrate various disciplines in learning to equip students with critical thinking, creativity, communication, and collaboration skills. One important aspect of implementing STEM is using technology as part of the learning process (Juškevičienė et al., 2021; Nikitina & Ishchenko, 2022). In physics education, technology can be used to develop interactive learning materials that improve conceptual understanding and arouse students' interest in science and technology (Prayogi & Verawati, 2024). However, the adoption of technology in developing physics teaching materials in Indonesia still faces various obstacles, especially regarding teacher readiness.

The results of a preliminary study conducted at 10 schools in Bandung City and West Bandung Regency revealed various significant challenges related to using technology-based learning materials in physics learning. Of the total 20 physics teachers involved in the observation, 70% stated that they could not optimally utilize technology-based learning materials in the classroom. The main obstacle reported was limited access to technological devices, where 60% of teachers stated that they did not have facilities such as laptops, projectors, or stable internet connections. In addition, 50% of teachers admitted that they did not understand the techniques and steps to develop interactive technology-based learning materials, such as simulations or special applications. Furthermore, the majority of teachers, namely 80%, felt that they had not received adequate training to support mastery of technology in physics learning. Interestingly, 40% of teachers also stated that the time available in their schedules was one of the obstacles to learning and developing technology-based teaching materials independently.

These findings confirm the deep gap between teachers' needs in STEM-based learning and relevant resources and training availability. In addition to the constraints of facilities and skills, the observation results also showed that 50% of teachers felt less confident in integrating technology into learning due to minimal support from the school, such as providing a unique budget for technology procurement or further training. This condition reflects that the challenges faced are technical and related to policies and work culture in the school environment. With these challenges, it becomes increasingly clear that an innovative, comprehensive, and needs-based training approach is needed. This training must be designed to bridge the gap by providing practical guidance, strengthening teacher competencies, and creating collaboration between teachers, technology developers, and policymakers. This more systematic approach is expected to encourage broader, planned, and practical application of technology in physics education.

Although many studies have highlighted the importance of technology in physics learning, such as the use of Augmented Reality, Kahoot, and interactive multimedia (Astuti et al., 2021; Cai et al., 2021; Rahmat et al., 2023; Yulianci et al., 2021), only a few have focused on the teacher's perspective in developing technology-based learning materials. Teachers are the main actors in implementing technology-based learning and play a crucial role in learning. As mentors and facilitators, teachers not only provide feedback and support needed by students throughout the learning process but also have a great responsibility in developing technology-based learning materials, although their involvement in the process is often limited (Basilotta Gómez-Pablos et al., 2017; Lai et al., 2016). Many teachers feel less confident or lack the technical skills to use technology effectively in learning (Anderson & Putman, 2020; Dinc, 2019; Kafyulilo et al., 2016; Winter et al., 2021). This indicates a gap in the literature on how teachers view their role in developing technology-based learning materials. This study aims to fill this gap by exploring teachers' perspectives on exhibition and workshop activities for the development of technology-based physics learning materials.

Exhibition and workshop activities can empower teachers to integrate technology into the learning process (McKnight et al., 2016). However, studies that specifically evaluate the effectiveness of such activities in the context of technology-based physics education are still minimal. Most studies focus on student learning outcomes without considering teachers' views and experiences as important components in successfully implementing technology-based learning. This study presents a new approach by exploring how teachers evaluate the benefits and impacts of the exhibition and workshop.

The uniqueness of this exhibition and workshop program lies in its collaborative and innovative approach that combines educational theory with the latest technology applications. The program focuses on improving teachers' technical skills and provides hands-on experience through an exhibition of technology-based teaching materials designed to support STEM-based physics learning. Designed by physics education master's students who deeply understand pedagogy and learning needs in the field, this program serves as an important bridge between academic research and real-world practice. In addition, this activity integrates various interactive learning tools and methods, such as the Physics Lab Mobile digital physics simulation application, Articulate Storyline, and LiveWorksheets software, as well as innovative technologies such as Google Sites, Augmented Reality (AR), and technology-based educational games. This approach provides practical experience that enriches teachers' insights and increases their readiness to adopt technology in the classroom. Since this method is rarely applied in teacher training in Indonesia, this program offers significant added value in improving the quality of physics education.

In addition to providing practical experience, this activity is designed to explore teachers' needs and views in more depth. The main questions raised in this activity cover several important aspects: (1) To what extent do physics teachers

understand the material presented in the technology-based learning materials development workshop? (2) How do teachers perceive the relevance and benefits of this workshop in supporting technology-based learning in their classrooms? (3) How do teachers evaluate the effectiveness of the implementation and facilitation of the workshop? (4) What is the real impact of the workshop on teachers' ability to integrate technology into physics learning materials in the classroom? These questions are designed to provide a comprehensive picture of teachers' experiences, needs, and challenges. With this systematic approach, this activity will provide short-term impacts in the form of increased technical skills and create long-term changes in the quality of technology-based physics learning in schools.

This activity's results are expected to significantly impact the development of a more effective and appropriate training model for physics teachers. By understanding the views and needs of teachers, training program developers can design activities that are more relevant and oriented toward improving teachers' practical abilities. In addition, this activity emphasizes the importance of collaboration between technology developers, educators, and policymakers in encouraging technology integration in education. In the long term, teacher empowerment through exhibitions and workshops is believed to improve the quality of physics learning in the classroom, creating a more dynamic and interactive learning experience for students (Mbowane et al., 2017). Teachers who are skilled in utilizing technology will be better able to encourage STEM-based learning, which is essential for building the skills of the younger generation in the digital era (Elstad & Christophersen, 2017; Fatimah & Santiana, 2017; Jääskelä et al., 2017).

Furthermore, this study addresses the main challenges that have hampered technology adoption in physics learning. Limited access to technological devices (Azlan et al., 2020; Fidan & Tuncel, 2021), lack of technical training for teachers (Falloon, 2020) and resistance to changes in teaching methods (Li & Austria, 2023; Souheyla & Nassima, 2022) are the focus of attention that can be addressed through this program. By documenting teachers' experiences, this study provides a basis for developing more inclusive and future-oriented education policies. This effort aligns with SDG 4: Quality Education, which seeks to ensure inclusive, equitable, and high-quality education and promote lifelong learning opportunities for all. Achieving this vision, particularly in physics education, calls for innovative approaches—one of which is STEM-based instruction. This approach necessitates the close integration of technology and pedagogy to foster engaging, future-oriented learning environments (AlAli, 2024; Dominguez et al., 2023). Teachers have a strategic role as the main link between technology and students, so learning success depends significantly on how much they are empowered and involved in developing technology-based learning materials (Gamage et al., 2022).

To effectively support and sustain this role, it is essential to embed technology within a broader framework of continuous professional development. Integrating information technology into lifelong education systems can provide enriched digital resources, intelligent data analysis, and adaptive online environments that enhance the effectiveness of teacher learning (Zhang et al., 2024). Moreover, establishing a lifelong learning mechanism rooted in the principles of quality education can significantly advance teachers' professional growth, improve educational quality, and nurture future-ready learners with strong innovative and practical capabilities (Qi, 2024). This is in line with one of the SDGs programs number 4, i.e. quality education, ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all (sdgs.un.org).

This study contributes to developing academic literature and practical solutions to improve the quality of physics education in the digital era. By documenting teachers' experiences, this study is expected to strengthen awareness of the importance of supporting teachers in facing the challenges of technology-based learning. In addition, the findings can serve as a foundation for the formulation of more relevant, effective, and sustainable education policies and training initiatives. Through this approach, technology-based physics education can act as a catalyst for innovation in science and technology, while equipping students to thrive in an increasingly complex and competitive global landscape.

METHOD

The method used in this study is a descriptive survey research method. Descriptive survey research aims to understand the relevance of a phenomenon and describe its incidence within a population (Zheng et al., 2020). In this study, the survey method was employed to identify and describe teachers' perceptions of the "Workshop on Developing Technology-Based Physics Teaching Materials" that was held in Bandung Barat. By using this approach, the research systematically captured data on how participants perceived the workshop's content, implementation, and outcomes.

This study employed purposive sampling to select participants, focusing on 51 physics teachers who actively participated in the workshop located in Bandung Barat. As Fowler (2014) highlights, purposive sampling is suitable for targeting individuals with specific expertise or direct experience relevant to the research objectives. This ensured that the selected participants were knowledgeable about the activities and technologies introduced during the workshop.

The primary survey instrument was a structured questionnaire, which was carefully designed in accordance with Dillman et al. (2014). Dillman emphasizes the importance of crafting survey instruments with attention to question wording, order, and response options to minimize bias and maximize response quality. The questionnaire consisted of 20 Likert-scale items (ranging from 1 = strongly disagree to 5 = strongly agree) that measured four key aspects shown by Figure 1.

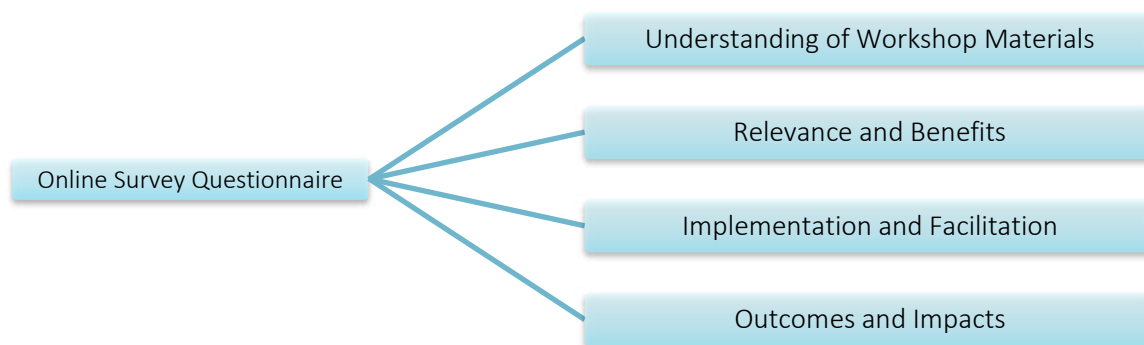


Figure 1. Key Aspects of the Questionnaire

The questionnaire aimed to evaluate both general workshop effectiveness and specific aspects, such as the integration of technologies, including Augmented Reality, Physics Mobile, Live Worksheet, Digital Games, Google Sites, and Articulate Storyline. This aligns with the principles outlined by Dubin, Malhotra, and Wacker, which emphasize the need to comprehensively capture participants' perceptions of a phenomenon's relevance.

Data analysis involved the use of descriptive statistics to calculate mean scores for each aspect, providing insights into the strengths and areas for improvement. Scoring ranges were predefined to offer a structured interpretation of the results (Creswell & Creswell, 2018), ensuring meaningful feedback for enhancing future workshops and supporting the integration of technology into physics teaching practices.

RESULTS AND DISCUSSION

A Workshop on the Development of Technology-Based Physics Learning Materials was conducted, focusing on the integration of advanced technologies such as Augmented Reality, Physics Mobile, Live Worksheets, Digital Games, Google Sites, and Articulate Storyline into physics teaching materials. The program comprised three main stages, carefully designed to ensure participants' comprehensive understanding and application of these technologies.

The first stage involved material briefings and workshops on how to develop learning materials using the specified technologies. During this stage, participants received both theoretical and practical knowledge on integrating technology into teaching practices, accompanied by in-depth demonstrations and hands-on activities. The second stage was a mentoring phase, where participants worked in groups to develop their teaching materials, present their progress, and receive feedback and guidance from assigned tutors. This stage emphasized collaboration and continuous refinement to perfect the developed teaching materials. The third stage was the presentation of the final products, where participants showcased the learning materials they had developed through an online session. This session provided an opportunity for participants to explain their designs and receive input from peers and facilitators.

After completing these three stages, a survey was conducted to gather teachers' perspectives on the workshop. The survey used a questionnaire consisting of 20 statements measured on a 5-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree." It was designed to evaluate participants' understanding of the material, the relevance and benefits of the technologies, the implementation and facilitation of the workshop, as well as its outcomes and impact on physics teaching. Based on the survey results, the average score for each aspect was analyzed using predetermined scoring guidelines to provide a more detailed interpretation of the teachers' perceptions of the workshop (as shown in Tables 1–4).

Table 1 Scoring Guidelines for the Aspect of Workshop Material Comprehension

Average Score Range	Description
1.0 - 1.4	Poor: Participants had significant difficulty understanding the workshop material. The material was either too challenging or presented unclearly.
1.5 - 2.4	Fair: Participants understood some of the material but still required intensive guidance for implementation.
2.5 - 3.4	Good: Participants understood the material well and felt reasonably confident in applying it.
3.5 - 5.0	Excellent: Participants fully comprehended the material and were able to apply it independently.

Table 2 Scoring Guidelines for the Aspect of Relevance and Benefits

Average Score Range	Description
1.0 - 1.9	Poor: The learning media were deemed irrelevant and did not adequately support the needs of physics instruction.

Average Score Range	Description
2.0 - 2.9	Fair: The learning media were moderately relevant but required adjustments to meet the needs of physics instruction.
3.0 - 4.4	Good: The learning media were relevant and significantly beneficial in enhancing the quality of instruction.
4.5 - 5.0	Excellent: The learning media were highly relevant and optimized to effectively support physics instruction in the classroom.

Table 3 Scoring Guidelines for the Aspect of Implementation and Facilitation

Average Score Range	Description
1.0 - 1.9	Poor: The workshop implementation was highly inadequate, with numerous technical issues and insufficient facilitation.
2.0 - 2.9	Fair: The implementation was moderately effective, but some challenges reduced the overall effectiveness of the activity.
3.0 - 3.9	Good: The workshop was well-executed, with adequate facilities to meet participants' needs.
4.0 - 5.0	Excellent: The workshop was executed exceptionally well, with optimal facilitation and smooth activity flow.

Table 4 Scoring Guidelines for the Aspect of Outcomes and Impact

Average Score Range	Description
1.0 - 1.4	Poor: The outcomes were inadequate, and participants were unable to produce usable learning media.
1.5 - 2.4	Fair: The outcomes were moderately satisfactory, but participants required additional guidance to achieve better results.
2.5 - 3.4	Good: The outcomes were adequate, and participants were able to produce learning media with minimal revisions.
3.5 - 5.0	Excellent: The outcomes were highly satisfactory, with participants producing high-quality learning media.

The analysis of the survey results provides a clear overview of teachers' perceptions regarding various aspects of the Technology-Based Physics Teaching Material Development Workshop. Each aspect was assessed based on the average scores of the questionnaire items. Specifically, the average scores for each statement in the questionnaire reflect a more detailed evaluation of the components being assessed. This data highlights the key strengths of the workshop while also offering insights into areas that can be improved in the future. Table 5 below presents the average scores for each questionnaire item across the evaluated aspects:

Table 5 Average Scores of Questionnaire Statements Based on Assessment Aspects

No	Questionnaire Statements	Average
Aspect: Understanding of Workshop Materials		
1	I understand the objectives of this activity in enhancing teachers' competence in developing technology-based learning materials.	4.27
2	The materials presented in the workshop align with the needs of physics education in high schools.	4.31
3	The explanation of using Augmented Reality in physics learning greatly improved my understanding.	4.31
4	Training on the development of teaching materials using Physics Mobile was easy to understand and implement in the classroom.	4.27
5	The material on Live Worksheet provides a creative solution for creating interactive practice questions.	4.27
Average		4.29
Aspect: Relevance and Benefits		
6	This activity is relevant to technological advancements required in education today.	4.12
7	I found this training to provide valuable new insights for physics learning.	4.12
8	The implementation of media like Google Sites simplifies the organization of learning materials.	4.20
9	The material on Articulate Storyline is very helpful for creating engaging and interactive learning materials.	4.20

No	Questionnaire Statements	Average
10	I feel confident applying the results of this training to improve the quality of education in my school.	4.12
Average		4.15
Aspect: Implementation and Facilitation		
11	The workshop committee and facilitators provided adequate assistance during the activity.	4.12
12	The duration of the workshop was sufficient to learn each topic presented.	4.24
13	I felt comfortable participating in this activity due to the conducive environment.	4.24
14	Group discussions helped me understand the materials more thoroughly.	4.14
15	The tools and media used during the activities supported the training smoothly.	4.14
Average		4.17
Aspect: Outcomes and Impacts		
16	The results of this activity motivated me to continue developing technology-based learning materials.	4.27
17	The learning products produced during the workshop met the standards of physics education.	4.27
18	I feel confident using the teaching materials developed during this activity in my classes.	4.14
19	This workshop enhanced my skills in utilizing technology for teaching.	4.14
20	I would recommend similar activities to fellow teachers.	4.18
Average		4.20

After reviewing the average score analysis for each item in the questionnaire, it is clear how teachers perceive various aspects of the Physics Teaching Materials Development Workshop Based on Technology. The data provides useful insights into the effectiveness and relevance of the materials presented, as well as the participants' reception of the use of technology in teaching. To gain a deeper understanding, the following discussion will explore each assessment aspect in more detail.

Understanding of Workshop Materials

The aspect of understanding workshop materials reflects the extent to which participants comprehended the concepts and technical use of the technology introduced during the event. The following documentation was obtained during the event:



(a)



(b)



Figure 1. Workshop activities: (a) Articulate Storyline; (b) Live Worksheets; (c) Augmented Reality; (d) Google Sites; (e) Mobile Physics; and (f) Digital Games.

After the teachers participated in the workshop, a questionnaire was administered to find out how the teachers' perspectives on the workshop were, resulting in an average score of 4.29, indicating that the teachers showed a very good understanding of the training content. This average also indicates that the comprehension aspect met participants' expectations, especially in terms of their mastery of basic concepts and their ability to implement the technologies taught. This is supported by the evaluation of the five indicators, all of which received high scores ranging from 4.27 to 4.31. The highest mean scores (4.31) were obtained in indicators 2 and 3, which relate to the technical understanding of applications such as Augmented Reality and Mobile Physics. This indicates that these technologies were presented in a clear and practical manner, enabling participants to understand their effective use.

However, some indicators received slightly lower average scores, specifically 4.27 for items 1, 4, and 5. This may suggest that, although the material was well-delivered, some teachers might require additional time or training to fully master the use of these technologies independently. Time constraints could hinder users from achieving knowledgeable, accurate, and efficient use of the technology, which is crucial for genuine mastery (Gleaton et al., 2023). Thus, implementing effective time management strategies becomes essential. Adopting time management strategies can help users allocate time more efficiently to learn and master the technology. Techniques such as breaking tasks into smaller, manageable parts and setting clear timelines can alleviate feelings of time scarcity and enhance focus (Holmes, 2023; Tupchenko, 2021). Additionally, the cognitive load imposed by technology-based learning environments can also pose a barrier. High cognitive demands may overwhelm users, making it difficult to process and retain new information, thus hindering mastery (Slava & Tzu-Chien, 2015). The shift from paper-based reading to digital reading has introduced complexities that can result in cognitive overload. The non-linear nature of hypertext requires readers to navigate and integrate information from multiple sources, which can overwhelm working memory and impede comprehension (Omar Taky-eddine & Redouane Madaoui, 2024). This overload can lead to stress, anxiety, and digital fatigue, further obstructing learning and retention (Masrek & Baharuddin, 2023).

Relevance and Benefits

This aspect evaluates the relevance of the instructional technologies introduced during the workshop to the teachers' needs in managing physics learning in the classroom and the perceived benefits after participating in the workshop. With an average score of 4.15, teachers' perceptions indicate that technologies such as Google Sites, Articulate Storyline, and

Digital Games are considered good to very good in supporting learning. The highest average score, 4.20, for indicators 8 and 9, reflects that teachers recognize the tangible benefits of these technologies in enhancing the interactivity and effectiveness of physics lessons. This also suggests that these technologies align well with the demands of technology-based learning.

This relevance aligns with the STEM (Science, Technology, Engineering, and Mathematics) approach, which emphasizes the integration of technology to promote interactive, contextual, and problem-solving-based learning. Technology plays a pivotal role in STEM education by providing tools that facilitate interactive learning (Topsakal et al., 2022). By leveraging technologies such as Google Sites, Articulate Storyline, and Digital Games, teachers can integrate science and technology aspects into physics learning, increasing student interest and improving conceptual understanding. Indirectly, teachers have utilized technology to enhance student engagement and comprehension to achieve optimal learning goals (Wang et al., 2022).

On the other hand, the average scores for indicators 6, 7, and 10 are 4.12, which still indicate positive perceptions but are slightly lower than other indicators. This may be because certain technologies, such as Live Worksheets, require additional adjustments to fit the context of physics learning. Teachers may need more specific examples of application relevant to their curriculum. Nevertheless, the workshop has significantly benefited teachers by introducing them to the use of technology in teaching.

In this context, technologies like Live Worksheets or other digital tools can serve as supplementary media to create more interactive and contextual learning experiences. By integrating digital tools into contextual learning approaches, teachers can align educational content with students' daily experiences (Alfira et al., 2024; Uden et al., 2023). This alignment increases the relevance of the material, making learning more meaningful and engaging for students. Despite the challenges of adaptation, the implementation of STEM-based technologies has the potential to significantly enhance the quality of physics instruction (Martínez-Borreguero et al., 2022). The workshop's activities are expected to provide substantial relevance and benefits for teachers in developing STEM-based learning, particularly in physics, through the use of technology. STEM-based technologies offer opportunities for teachers to design learning projects that connect physics with other STEM disciplines (Tuveri et al., 2024).

Implementation and Facilitation

This aspect evaluates the implementation of the workshop, including the smoothness of the process, the preparedness of the organizing committee, and the support provided by facilitators during the workshop. With an average score of 4.17, the implementation is rated as good to very good. Indicators 12 and 13 recorded the highest scores of 4.24, indicating that technical facilitation and support during the training were perceived as highly optimal. Facilitators were deemed capable of providing adequate guidance, enabling participants to easily follow the flow of activities.

Slightly lower average scores were observed for indicators 11, 14, and 15, with scores ranging from 4.12 to 4.14. This may be attributed to minor technical issues or differences in participants' levels of understanding, which required more individualized attention. Despite this, the overall implementation of the workshop proceeded smoothly, and the facilitators successfully created a conducive environment for teachers to learn and engage in discussions. This reflects that the planning and organization of the workshop were executed effectively.

Results and Impact of the Activity

The aspect of results and impact reflects the extent to which teachers were able to produce technology-based learning media and the activity's effect on their competencies. An average score of 4.20 indicates that the outcomes of the activity were rated as very good. Indicators 16 and 17 achieved the highest scores of 4.27, suggesting that participants felt confident in implementing the learning media they developed, particularly using Augmented Reality and Articulate Storyline. This highlights that the training had a positive impact on teachers' abilities to create innovative teaching materials.

On the other hand, indicators 18, 19, and 20 received slightly lower scores, ranging from 4.14 to 4.18. This may indicate that, despite the overall excellent outcomes, some participants felt they needed more time to explore and develop their learning media further. Overall, the activity had a significant positive impact on enhancing teachers' competencies in utilizing technology, while also strengthening the implementation of technology-based learning media in the classroom.

CONCLUSION

The workshop on developing technology-based physics learning materials was perceived by participants as having a positive influence on their awareness, confidence, and understanding of using technology such as Augmented Reality, Physics Mobile, Live Worksheet, Google Sites, and Articulate Storyline in physics learning. The high level of participant satisfaction shows that this workshop is relevant to the needs of STEM-based learning and can increase teachers' confidence in integrating technology into the classroom. Although some teachers still need additional time and guidance to master the technology, this activity has been a significant initial step in empowering teachers to create learning

innovations. In the future, it is recommended that the duration of the workshop be extended or supplemented with further mentoring sessions to ensure in-depth understanding. Training materials can also be adjusted more specifically to the national physics curriculum to make their implementation more relevant. In addition, there needs to be collaboration with local governments, schools, and technology developers to support adequate facilities, such as hardware, software, and internet access. Developing a modular ongoing training program is also essential to provide more in-depth training in stages. Evaluation of the workshop's impact can be expanded by measuring the direct implementation of technology in the classroom and building a community of technology-based physics teacher practitioners to share experiences and solutions. These steps are expected to support the sustainability of technology implementation in physics learning in Indonesia and improve the quality of STEM education.

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REFERENCES

- Akudugu, M. A., & Abagale, F. K. (2024). Building inclusive ethical cultures in STEM. In Hildt, E., Laas, K., Brey, E.M., Miller, C.Z (Eds), *Ethics education in science, technology, engineering and mathematics (STEM) in africa: A reflection on the successes, failures and the way forward in the era of a global pandemic*. Springer.
https://doi.org/10.1007/978-3-031-51560-6_7
- AlAli, R. (2024). Enhancing 21st century skills through integrated stem education using project-oriented problem-based learning. *GeoJournal of Tourism and Geosites*, 53(2), 421–430. <https://doi.org/10.30892/gtg.53205-1217>
- Alfira, A., Salmilah, S., & Suryani, L. (2024). Revolutionizing learning. *International Journal of Asian Education*, 5(2), 141–149. <https://doi.org/10.46966/ijae.v5i2.385>
- Anderson, S. E., & Putman, R. S. (2020). Special education teachers' experience, confidence, beliefs, and knowledge about integrating technology. *Journal of Special Education Technology*, 35(1), 37–50.
<https://doi.org/10.1177/0162643419836409>
- Astuti, I. A. D., Bhakti, Y. B., Sumarni, R. A., Sulisworo, D., & Toifur, M. (2021). Flipped classroom and kahoot in physics learning: improving students' motivation learning. *International Journal of Educational Management and Innovation*, 2(2), 175. <https://doi.org/10.12928/ijemi.v2i2.3491>
- Azlan, C. A., Wong, J. H. D., Tan, L. K., A.D. Huri, M. S. N., Ung, N. M., Pallath, V., Tan, C. P. L., Yeong, C. H., & Ng, K. H. (2020). Teaching and learning of postgraduate medical physics using Internet-based e-learning during the COVID-19 pandemic – A case study from Malaysia. *Physica Medica*, 80, 10–16.
<https://doi.org/10.1016/j.ejmp.2020.10.002>
- Basilotta Gómez-Pablos, V., Martín del Pozo, M., & García-Valcárcel Muñoz-Repiso, A. (2017). Project-based learning (PBL) through the incorporation of digital technologies: An evaluation based on the experience of serving teachers. *Computers in Human Behavior*, 68, 501–512. <https://doi.org/10.1016/j.chb.2016.11.056>
- Cai, S., Liu, C., Wang, T., Liu, E., & Liang, J. (2021). Effects of learning physics using augmented reality on students' self-efficacy and conceptions of learning. *British Journal of Educational Technology*, 52(1), 235–251.
<https://doi.org/10.1111/bjet.13020>
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method*. John Wiley & Sons.
- Dinc, E. (2019). Prospective teachers' perceptions of barriers to technology integration in education. *Contemporary Educational Technology*, 10(4), 381–398. <https://doi.org/10.30935/cet.634187>
- Dominguez, A., De la Garza, J., Quezada-Espinoza, M., & Zavala, G. (2023). integration of physics and mathematics in STEM education: use of modeling. *Education Sciences*, 14(1), 20. <https://doi.org/10.3390/educsci14010020>

- Elstad, E., & Christophersen, K.-A. (2017). Perceptions of digital competency among student teachers: contributing to the development of student teachers' instructional self-efficacy in technology-rich classrooms. *Education Sciences*, 7(1), 27. <https://doi.org/10.3390/educsci7010027>
- Falloon, G. (2020). From digital literacy to digital competence: the teacher digital competency (TDC) framework. *Educational Technology Research and Development*, 68(5), 2449–2472. <https://doi.org/10.1007/s11423-020-09767-4>
- Fatimah, A. S., & Santiana, S. (2017). Teaching in 21st century: students-teachers' perceptions of technology use in the classroom. *Script Journal: Journal of Linguistic and English Teaching*, 2(2), 125. <https://doi.org/10.24903/sj.v2i2.132>
- Fidan, M., & Tuncel, M. (2021). Developing a self-efficacy scale toward physics subjects for lower-secondary school students. *Journal of Baltic Science Education*, 20(1), 38–49. <https://doi.org/10.33225/jbse/21.20.38>
- Fowler, F. J. (2014). The problem with survey research. *Contemporary Sociology: A Journal of Reviews*, 43(5), 660–662. <https://doi.org/10.1177/0094306114545742f>
- Gamage, K. A. A., Ekanayake, S. Y., & Dehideniya, S. C. P. (2022). Embedding sustainability in learning and teaching: lessons learned and moving forward—approaches in STEM higher education programmes. *Education Sciences*, 12(3), 225. <https://doi.org/10.3390/educsci12030225>
- Gleaton, E., Parcell, E., Madera, M., Catrambone, R., & Walker, B. (2023). Understanding user perspectives: what is the meaning of technology mastery?. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 67(1), 2490–2493. <https://doi.org/10.1177/21695067231192628>
- Holmes, M. (2023). Time scarcity and student performance: instructional strategies for busy adult online students. *Canadian Journal of Learning and Technology*, 48(3), 1–14. <https://doi.org/10.21432/cjlt28357>
- Jääskelä, P., Häkkinen, P., & Rasku-Puttonen, H. (2017). Teacher beliefs regarding learning, pedagogy, and the use of technology in higher education. *Journal of Research on Technology in Education*, 49(3–4), 198–211. <https://doi.org/10.1080/15391523.2017.1343691>
- Juškevičienė, A., Dagienė, V., & Dolgopolas, V. (2021). Integrated activities in STEM environment: Methodology and implementation practice. *Computer Applications in Engineering Education*, 29(1), 209–228. <https://doi.org/10.1002/cae.22324>
- Kafyulilo, A., Fisser, P., & Voogt, J. (2016). Factors affecting teachers' continuation of technology use in teaching. *Education and Information Technologies*, 21(6), 1535–1554. <https://doi.org/10.1007/s10639-015-9398-0>
- Lai, C., Yeung, Y., & Hu, J. (2016). University student and teacher perceptions of teacher roles in promoting autonomous language learning with technology outside the classroom. *Computer Assisted Language Learning*, 29(4), 703–723. <https://doi.org/10.1080/09588221.2015.1016441>
- Li, W., & Austria, R. S. (2023). Supervision and management of teaching quality of college teachers in h university. *Journal of Education, Humanities and Social Sciences*, 21, 235–240. <https://doi.org/10.54097/ehss.v21i.14010>
- Martínez-Borreguero, G., Naranjo-Correa, F. L., & Mateos-Núñez, M. (2022). Development of STEM instructional resources for teaching optics to teachers-in-training: influence on learning and teacher self-efficacy. *Education Sciences*, 12(3), 186. <https://doi.org/10.3390/educsci12030186>
- Masrek, M. N., & Baharuddin, M. F. (2023). Screens, streams, and stress: a qualitative study on how distance learning students cope with information overload. *International Journal of Membrane Science and Technology*, 10(5), 47–58. <https://doi.org/10.15379/ijmst.v10i5.2417>
- Mbowane, C. K., De Villiers, J. J. R., & Braun, M. W. H. (2017). Teacher participation in science fairs as professional development in South Africa. *South African Journal of Science*, 113(7/8), 7. <https://doi.org/10.17159/sajs.2017/20160364>
- McKnight, K., O'Malley, K., Ruzic, R., Horsley, M. K., Franey, J. J., & Bassett, K. (2016). Teaching in a digital age: how educators use technology to improve student learning. *Journal of Research on Technology in Education*, 48(3), 194–211. <https://doi.org/10.1080/15391523.2016.1175856>
- Nikitina, I., & Ishchenko, T. (2022). Implementation of stem education system in Ukraine. *Scientific Journal of Polonia University*, 51(2), 108–114. <https://doi.org/10.23856/5114>
- Omar Taky-eddine, & Redouane Madaoui. (2024). Cognitive overload in the hypertext reading environment. *International Journal of English Language Studies*, 6(2), 94–100. <https://doi.org/10.32996/ijels.2024.6.2.13>
- Prayogi, S., & Verawati, N. N. S. P. (2024). Physics learning technology for sustainable development goals (SDGs): a literature study. *International Journal of Ethnoscience and Technology in Education*, 1(2), 155. <https://doi.org/10.33394/ijete.v1i2.12316>
- Qi, J. (2024). Research on the construction of teachers' lifelong learning mechanism based on the concept of quality education. *Transactions on Comparative Education*, 6(3). <https://doi.org/10.23977/trance.2024.060304>
- Rahmat, A. D., Kuswanto, H., Wilujeng, I., & Perdana, R. (2023). Implementation of mobile augmented reality on physics learning in junior high school students. *Journal of Education and E-Learning Research*, 10(2), 132–140. <https://doi.org/10.20448/jeelr.v10i2.4474>

- Slava, K., & Tzu-Chien, L. (2015). Guest Editorial: Managing cognitive load in technology-based learning environments. *Educational Technology & Society*, 18(4), 1–8.
- Souheyla, B., & Nassima, B. (2022). Taking the wave of digitalization: reflection on the psychological readiness of teachers in using information and communication technologies. *Arab World English Journal*, 8, 121–135. <https://doi.org/10.24093/awej/call8.8>
- Topsakal, İ., Yalçın, S. A., & Çakır, Z. (2022). The effect of problem-based STEM education on the students' critical thinking tendencies and their perceptions for problem solving skills. *Science Education International*, 33(2), 136–145. <https://doi.org/10.33828/sei.v33.i2.1>
- Tupchenko. (2021). Time-management as a pedagogical technology of students' educational activity. *Problemi Inženerno-Pedagogičnoï Osviti*, 73. <https://doi.org/10.32820/2074-8922-2021-73-138-144>
- Tuveri, M., Steri, A., Fadda, D., Stefanizzi, R., Fanti, V., & Bonivento, W. M. (2024). Fostering the interdisciplinary learning of contemporary physics through digital technologies: The “gravitas” project. *Digital*, 4(4), 971–989. <https://doi.org/10.3390/digital4040048>
- Uden, L., Sulaiman, F., Ching, G. S., & Rosales, J. J. (2023). Integrated science, technology, engineering, and mathematics project-based learning for physics learning from neuroscience perspectives. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1136246>
- United Nations Department of Economic and Social Affairs. The 17 Goals. <https://sdgs.un.org/goals>
- Wang, L.-H., Chen, B., Hwang, G.-J., Guan, J.-Q., & Wang, Y.-Q. (2022). Effects of digital game-based STEM education on students' learning achievement: a meta-analysis. *International Journal of STEM Education*, 9(1), 26. <https://doi.org/10.1186/s40594-022-00344-0>
- Winter, E., Costello, A., O'Brien, M., & Hickey, G. (2021). Teachers' use of technology and the impact of Covid-19. *Irish Educational Studies*, 40(2), 235–246. <https://doi.org/10.1080/03323315.2021.1916559>
- Yulianci, S., Nurjumiati, N., Asriyadin, A., & Adiansha, A. A. (2021). The effect of interactive multimedia and learning styles on students' physics creative thinking skills. *Jurnal Penelitian Pendidikan IPA*, 7(1), 87–91. <https://doi.org/10.29303/jppipa.v7i1.529>
- Zhang, Y., Ye, H., & Chen, H. (2024). Construction of a new lifelong education system based on vector analysis algorithms for information age services. *Computer Applications in Engineering Education*, 32(6). <https://doi.org/10.1002/cae.22774>
- Zheng, T., Ardolino, M., Bacchetti, A., Perona, M., & Zanardini, M. (2019). The impacts of Industry 4.0: a descriptive survey in the Italian manufacturing sector. *Journal of Manufacturing Technology Management*, 31(5), 1085–1115. <https://doi.org/10.1108/JMTM-08-2018-0269>



Optimizing the health of the elderly and menopausal women with self-management health education as an effort to treat hypertension in Talang Jambe Palembang

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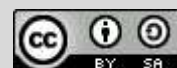
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ARTICLE INFO	ABSTRACT
Article history Received: 2025-01-14 Revised: 2025-03-09 Accepted: 2025-03-28 Published: 2025-04-22 Keywords Elderly Menopause Self-Management Hypertension	Elderly people with hypertension are at risk of experiencing severe cardiovascular complications. Self-management education efforts are important to increase patient independence to prevent the severity of hypertension. The purpose of this community service (PKM) is to optimize the health of the elderly and menopausal women through self-management health education as an effort to treat hypertension in Talang Jambe Village, Palembang. This PKM program began with the consolidation of the Health Office and Talang Jambe Health Center to identify participants. There were 41 elderly and menopausal participants who participated in this PKM. At the implementation stage, blood pressure, knowledge and behavior were checked. The intervention was given in four sessions with a duration of 60 minutes. The evaluation included blood pressure conditions and knowledge, and behavior of participants. A total of 39 participants completed this program. Two participants did not complete it because their health conditions did not allow it. Data analysis used frequency distribution and the Paired T test and Wilcoxon test. The results of the PKM showed a significant increase in the mean knowledge score, from 56.67 ± 6.7 to 86.08 ± 7.63 ($p = 0.000$), and the mean value for behavior score, from 53.9 ± 6.03 to 85.31 ± 9.24 ($p = 0.000$). The majority of participants initially reported low levels of activity in terms of exercise frequency, but after the intervention, there was a marked increase, with more respondents exercising three to five times a week. Furthermore, diastolic blood pressure decreased from 108.28 ± 9.8 mmHg to 99.77 ± 10.39 mmHg ($p = 0.000$), and systolic blood pressure decreased from 197.72 ± 15.16 mmHg to 172.64 ± 10.46 mmHg ($p = 0.000$). The PKM program has been shown to be effective in improving knowledge, behavior, and blood pressure control in preventing hypertension complications.
Kata Kunci Lansia Menopause Manajemen Diri Hipertensi	Optimalisasi kesehatan lansia dan wanita menopause melalui pendidikan kesehatan manajemen diri sebagai upaya penanganan hipertensi di Desa Talang Jambe Palembang. Lansia dengan hipertensi berisiko untuk mengalami komplikasi kardiovaskular yang parah. Upaya pendidikan manajemen diri penting untuk meningkatkan kemandirian pasien dalam mencegah bertambah parahnya hipertensi. Tujuan Pengabdian Kepada Masyarakat ini (PKM) adalah untuk optimalisasi kesehatan lansia dan wanita menopause melalui pendidikan kesehatan manajemen diri sebagai upaya penanganan hipertensi di Desa Talang Jambe Palembang. Program PKM ini diawali dari konsolidasi Dinas Kesehatan dan Puskesmas Talang Jambe untuk identifikasi peserta. Terdapat 41 peserta lansia dan menopause yang mengikuti PKM ini. Pada tahap pelaksanaan dilakukan pemeriksaan tekanan darah, pengetahuan dan perilaku. Intervensi diberikan dalam empat sesi dengan durasi 60 menit. Evaluasi meliputi kondisi tekanan darah dan pengetahuan terkait tekanan darah, serta perilaku peserta. Sebanyak 39 peserta telah menyelesaikan program ini, sedangkan dua orang tidak dapat menyelesaikan karena kondisi kesehatan yang tidak memungkinkan. Analisis data menggunakan distribusi frekuensi dan uji <i>T Paired</i> dan <i>Wilcoxon</i>. Hasil PKM menunjukkan nilai rata-rata untuk pengetahuan meningkat dari $56,67 \pm 6,7$ menjadi $86,08 \pm 7,63$ ($p = 0,000$), dan nilai rata-rata untuk perilaku meningkat dari $53,9 \pm 6,03$ menjadi $85,31 \pm 9,24$ ($p = 0,000$). Mayoritas peserta awalnya melaporkan tingkat aktivitas yang rendah dalam hal frekuensi olahraga, tetapi setelah intervensi, terjadi peningkatan yang nyata, dengan lebih banyak responden berolahraga tiga hingga lima kali seminggu. Lebih jauh, tekanan darah diastolik turun dari $108,28 \pm 9,8$ mmHg menjadi $99,77 \pm 10,39$ mmHg ($p = 0,000$), dan tekanan darah sistolik turun dari $197,72 \pm 15,16$ mmHg menjadi $172,64 \pm 10,46$ mmHg ($p = 0,000$). Program PKM terbukti efektif dalam meningkatkan pengetahuan, perilaku, dan kontrol tekanan darah dalam mencegah komplikasi hipertensi.

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INTRODUCTION

Hypertension is one of the most common health problems among the elderly and menopausal women. Globally, the prevalence hypertension among woman aged 40-79 years range between 33% to 52%, with significant increase in the 70-79 age group, where it ranges from between 61% and 82% (Jadhav & Khilari, 2020). In Asia, *The prevalence of hypertension* in the elderly is estimated between 8-18% (Sy et al., 2022). In Indonesia, case Hypertension among women is 10.5%, with rates among the elderly and menopausal women ranging from from 11.8%-26.1%. Meanwhile, cases hypertension in South Sumatra reached 7.2%. (Kemenkes BKPK, 2023). A systematic review showed that the main risk factors for hypertension among the elderly in Indonesia include a high-sodium, low-potassium diet and a sedentary lifestyle which increases BMI, becomes main trigger of hypertension in the city. In rural areas, aging is a major risk factor, possibly due to physiological changes such as arterial stiffening, which can lead to increased blood pressure (Astutik et al., 2021).

Hypertension increases the risk of cardiovascular disease, stroke, and other health complications. Menopause is associated with higher risk of cardiovascular and metabolic, including hypertension, due to the disappearance effect of protection from estrogen (Siusiuka et al., 2024). Elderly and menopausal women experience various physiological change that affect pressure blood balance, so they need special attention in hypertension prevention and treatment effort (WHO, 2023). Health education becomes one of the effective strategies in increasing awareness and knowledge about the importance of maintaining normal blood pressure. Educational effort focusing on reducing sodium intake, increasing the consumption of food high in potassium (Lee & Shin, 2022), along with weight management, are essential (Ruzicka & Hiremath, 2024). Routine monitoring of blood pressure in the elderly and early intervention are also important (Dhiman & Chourasia, 2024).

The global burden of hypertension requires tailored interventions to improve awareness and management practices. Knowledge, Attitudes and Practices (KAP) assessment is an important tool for identifying gaps and formulating effective strategies (Miah et al., 2018). Self-management programs for the elderly in Indonesia have implemented to overcome low understanding of hypertension prevention through healthy lifestyle. These programs aim to increase the knowledge and skills among elderly, focusing on diet habits, physical activities, and stress management to prevent hypertension. Regardless of this effort, challenges remain in increasing awareness and promoting behavioral change among the elderly population. The understanding of hypertension through healthy lifestyles is still considered low. Therefore, education about balanced dietary habits, appropriate physical activity, and stress management is important the effort to prevent and control hypertension.

Community service through health education programs with emphasizing self-management of hypertension is expected to give positive and sustainable impact on elderly and menopausal women. This program is also in line with Sustainable Development Goals (SDGs) point 3, with focus in ensuring healthy lives and promoting well-being for all (United Nations, 2015). This project, which focuses on self-management health education for elderly and menopausal women in Talang Jembe, Palembang, directly contributes to this goal by enhancing awareness and practices related to hypertension prevention and management. By combining practical demonstrations with interactive teaching methods, the program has successfully encouraged behavioral change, with high levels of participant satisfaction and strong commitment to applying the techniques learned (Utomo & Hidayah, 2024). Although this short-term educational initiative has shown positive results, challenges remain in sustaining long-term behavioral changes and expanding the reach to a wider audience. Additionally, integrating family involvement and regular health check-ups can further enhance the effectiveness and sustainability of this program (Barlia & Putro, 2024).

Providing education on hypertension self-management for the elderly is a multifaceted approach that has shown promising results in improving health outcomes. These programs integrate health education, chronic disease management, and self-management strategies to empower elderly to take control of their health (Lin, 2024). The effectiveness of such programs is supported by various studies, which highlight improvements in blood pressure control, emotional well-being, and self-management behaviors among older adults. Through innovative and creative delivery of educational materials, the program aims to enhance understanding and awareness among elderly and menopausal women about the importance of managing hypertension (Natrapee Jaingam et al., 2024). This program used an approach that customized to participants' needs and characteristics, ensuring that the content is well-received and easily applicable in daily life (Ibrahim & Duana, 2024). By optimizing health education, it is expected that the prevalence of hypertension can be reduced, and the quality of life for elderly and menopausal women can be improved.

This community service initiative aims to enhance the health and well-being of elderly and menopausal women through self-management health education as a strategy for hypertension management in Talang Jembe, Palembang. Hypertension remains a prevalent non-communicable disease (NCD) among elderly women, and although routine integrated health service posts (*Posyandu Lansia*) have been implemented monthly, many participants still face challenges in managing their condition independently. Based on data from 67 active elderly and perimenopausal women enrolled in the PTM Puskesmas Program, 41 participants were identified as having either controlled or uncontrolled hypertension. Despite prior educational exposure at the health center, interviews revealed that a significant portion (29 participants) still struggle with self-management, particularly in consistently adopting physical and psychological coping strategies for blood pressure control.

METHOD

This community service program was conducted to enhance participants' ability to manage hypertension independently. The program was initiated by STIKes Mitra Adiguna Palembang, in collaboration with Talang Jembe Public Health Center and community health workers (*kader Posyandu Lansia*). This community service activity was carried out in November - December 2024 at the Talang Jembe Community Health Center and Posyandu Lansia. The primary objectives were to increase knowledge and awareness about hypertension, promote behavioral changes in diet and physical activity, and improve participants' ability to monitor and control their blood pressure. This activity begins with the initial stage through licensing and determining the target participants. The activity begins with coordination with the Palembang City Health Office and the Talang Jembe Health Center.

The program was structured into four stages: analysis, training, mentoring, and evaluation. In the analysis stage, baseline data collection and interviews were conducted to assess participants' existing knowledge and health practices. Recruitment of participants through socialization at the Lansia Posyandu and Posbindu in the Talang Jembe Health Center work area. Furthermore, a health check was carried out in the form of measuring blood pressure, characteristics and distributing questionnaires to identify the level of knowledge and behavior of participants regarding hypertension management. The hypertension management knowledge questionnaire was adopted from research by Hidayatullah and Rokhmianti (2023), while the hypertension management behavior was adopted from research by Sutrisno et al. (2018). Based on the assessment results, participants will be focused on groups with a high risk of hypertension and a low level of knowledge regarding health management. A total of 41 elderly and perimenopausal women diagnosed with hypertension were selected based on their participation in the PTM Puskesmas Program and their willingness to engage in structured health education activities. In this community service, 39 of the 41 participants completed the self-management program. Two participants did not complete the program because their health conditions worsened so they did not attend the third and fourth sessions.

The training stage involved two educational sessions (60 minutes each) covering hypertension awareness, self-management strategies, and lifestyle modifications using visual aids, booklets, and interactive discussions. During the mentoring stage, participants were encouraged to apply their learning through daily blood pressure monitoring, self-care diaries, and peer support groups facilitated by community health workers. Participants willing to participate in the activity will check their blood pressure first, followed by an educational session delivered through interactive counseling and live demonstrations. The sessions covered choosing foods that maintain blood pressure, stress management, cooking low-salt foods, and light physical exercise. The use of interactive tools in health education has been effective in improving self-management and blood pressure control among hypertensive patients (Fajriyah et al., 2024). The educational material focuses on the introduction of hypertension, its impact on health, and preventive and management steps that can be done independently. This educational activity is carried out in four sessions, each lasting 60 minutes, with a simple and practical approach for elderly and menopausal women so that the material is easy to understand and apply.

The final evaluation stage assessed the program's impact through post-test knowledge assessments, blood pressure measurements, and focus group discussions (FGDs). The findings from this stage will also be reported to the village and health center as a basis for recommendations for further programs. The results measured through this program are an increase in participants' knowledge about hypertension and its management, followed by changes in healthier behavior such as implementing a low-salt diet, regular exercise, and better stress management. In addition, it is expected that there will be an improvement in the health conditions of participants, which is indicated by a decrease in blood pressure and more optimal weight management. This program also targets the formation of peer support groups that can encourage the sustainability of independent health practices among the elderly and menopausal women.

RESULTS AND DISCUSSION

The community service team designed an educational self-management program that focused on self-management strategies for hypertension. The program included modules on hypertension awareness, dietary management (low-salt diet), physical activity, and stress management. Educational materials such as booklets, posters, and visual aids were developed to support interactive learning. In addition, health monitoring tools such as blood pressure records were prepared to encourage participants to monitor their health actively. Implementation of the program is shown in Figure 1.

The study's 39 respondents' characteristics are shown in Table 1. Participants over 65 years old made up the largest percentage (43.6%), followed by those 45–54 (30.8%) and 55–64 (25.6%). In terms of education, the majority of respondents (35.9%) held a university degree, while others had finished elementary school (17.9%), junior high school (23.1%), and senior high school (23.1%). Regarding occupation, 20.5% were retired, 23.1% were self-employed, 25.6% were working in other fields, and 30.8% were housewives. In terms of hypertension, 35.9% of people had uncontrolled hypertension, while 64.1% had it under control. Furthermore, 46.2% of respondents did not have a family history of hypertension, but 53.8% of respondents did.



Figure 1. Implementation of the program

Table 1. Respondent characteristics (n=39)

Variable	n	Percentage
Ages (year)		
45-54	12	30,8%
55-64	10	25,6%
>65	17	43,6%
Total	39	100,0%
Educations		
Elementary	7	17,9%
Junior High School	9	23,1%
Senior High School	9	23,1%
University	14	35,9%
Total	39	100,0%
Works		
Housewife	12	30,8%
Retired	8	20,5%
Self-employed	9	23,1%
Other	10	25,6%
Total	39	100,0%
Hypertension Status		
Uncontrollable	14	35,9%
Under control	25	64,1%
Total	39	100,0%
Family History		
Exist	21	53,8%
No	18	46,2%
Total	39	100,0%

Respondent data collection including age, education, occupation, hypertension status and family history is important to assess knowledge and behavior related to hypertension management is essential to understand and improve patient outcomes (AlHadlaq et al., 2019; Maluwa et al., 2025). The studies highlight the importance of knowledge and behavior in managing hypertension effectively. They emphasize the role of education and self-management in controlling hypertension and preventing its complications (Machaalani et al., 2022).

Age is a significant factor, with older adults often experiencing higher rates of hypertension prevalence. However, studies have shown mixed results regarding its impact on self-management behaviors. For example, one study found no

significant association between age and self-management behaviors (Ningsih et al., 2024), while another identified an association between age and lifestyle changes for hypertension control (Iriana et al., 2022). Education level is consistently associated with hypertension knowledge and management. Higher education level is correlated with better understanding and management of hypertension (Hamid, 2024). Conversely, lower education level is associated with knowledge deficits, highlighting the need for targeted educational interventions (Figueiredo et al., 2023).

Family history did not show a significant direct relationship with lifestyle changes (Iriana et al., 2022). However, awareness of family history may motivate individuals to adopt preventive measures. Hypertension status, especially duration since diagnosis, influences the level of knowledge, with newly diagnosed individuals often having lower awareness (Hamid, 2024). While these factors are very important, the role of external environmental support and community intervention should not be overlooked. These can significantly enhance lifestyle changes and self-management practices, offering a broader perspective on managing hypertension effectively.

Table 2 illustrates the modifications in respondents' behavior, knowledge, and blood pressure that occurred prior to and subsequent to the health education intervention. The participants' comprehension of hypertension and self-management was considerably enhanced, as evidenced by a significant increase in the mean knowledge score from 56.67 ± 6.7 to 86.08 ± 7.63 ($p < 0.001$). In the same vein, the mean behavior score increased from 53.9 ± 6.03 to 85.31 ± 9.24 ($p < 0.001$), indicating a higher degree of compliance with lifestyle modifications, including stress management and diet. The intervention's efficacy in promoting consistent exercise was also demonstrated by a substantial increase in the number of respondents who engaged in physical activity ($p < 0.001$).

Table 2. Knowledge, Behavior, and Blood Pressure Before and After Education (n=39)

Variable	Pre-Test	Post Test	Delta	P value
Knowledge				0,000*
Mean $\pm$ SD	56,67 $\pm$ 6,7	86,08 $\pm$ 7,63	29,41 $\pm$ 10,750	
Median	56,0	87,0		
Range	46-67	71-98		
Behavior				0,000*
Mean $\pm$ SD	53,9 $\pm$ 6,03	85,31 $\pm$ 9,24	31,41 $\pm$ 10,9	
Median	53,0	84,0		
Range	45-67	70-100		
Exercise				0,000**
Mean $\pm$ SD	0,9 (0,7)	3,51 (1,07)	-2,61 $\pm$ 0,2	
Median	1	3,0		
Range	0-2	2-5		
Blood pressure Systole (mmHg)				0,000*
Mean $\pm$ SD	197,72 $\pm$ 15,16	172,64 $\pm$ 10,46	-25,07 $\pm$ 18,98	
Median	197,0	174,0		
Range	172-225	153-189		
Blood pressure Diastolic (mmHg)				0,000*
Mean $\pm$ SD	108,28 $\pm$ 9,8	99,77 $\pm$ 10,39	-8,513 $\pm$ 13,262	
Median	109,0	102,0		
Range	93-124	82,115		

Test description: *) T Paired Test, **) Wilcoxon Test

Both systolic and diastolic blood pressure were significantly reduced as a result of the intervention in the context of blood pressure control. Specifically, the mean systolic blood pressure decreased from 197.72 ± 15.16 mmHg to 172.64 ± 10.46 mmHg ($p < 0.001$), while the mean diastolic blood pressure decreased from 108.28 ± 9.8 mmHg to 99.77 ± 10.39 mmHg ($p < 0.001$). The observed changes were unlikely to have occurred by coincidence, as the significant p-values suggest that these improvements were statistically meaningful. The results emphasize that self-management education effectively enhances health knowledge, improves behavior, and reduces hypertension-related risks in perimenopausal and elderly women.

Self-management-based health education is an important component of self-care nursing theory, emphasizing the importance of individual perception and behavior change in managing chronic conditions such as hypertension. This approach has been shown to be effective in improving blood pressure control, especially in elderly hypertensive patients (Bahar, 2020). Hypertension knowledge significantly impacts management and adherence to treatment. Health education initiatives targeting patients with new and less knowledgeable hypertension are essential, as these groups often have lower awareness and knowledge of hypertension (Hamid, 2024). The level of knowledge of hypertensive patients about their disease and its risk factors is still low. Factors that influence this knowledge are employment in government agencies, duration of treatment, and distance from residence to health facilities. Therefore, health education needs to be focused on patients working in the non-government sector, patients who have only been on treatment for less than two years, and those living in remote areas to improve understanding of hypertension (Wolde et al., 2022). Integrating self-management

strategies into health education can significantly improve patients' ability to monitor and control their blood pressure, thereby improving their overall health outcomes. The following section explores the effectiveness of self-management interventions in the management of hypertension.

In line with research (Figueiredo et al., 2023), it shows that programs empowering patients and their families through education and self-care strategies lead to improved disease management. Post-intervention, participants showed increased knowledge, better self-care practices, and healthier lifestyle changes. Health literacy is directly related to better self-management behaviors, highlighting the importance of accessible health information and educational programs (Muthahharah et al., 2024). Effective self-management education must consider the perspectives of diverse stakeholders, including patients, health care providers, and policy makers. Customized communication, interactivity, and active monitoring are essential components of a successful self-management program (Soleimani et al., 2024).

This Study Prior to the intervention, participants exhibited a low to moderate understanding of hypertension management, with an average knowledge score of 56.67 ± 6.7 . Numerous participants exhibited insufficient awareness regarding dietary modifications, consistent blood pressure monitoring, and the significance of medication compliance. Following the acquisition of structured self-management education, the average knowledge score markedly rose to 86.08 ± 7.63 ($p < 0.001$), signifying a considerable enhancement. This indicates that focused instruction significantly improves participants' comprehension and their capacity to autonomously manage hypertension. Supported by previous studies, Health education significantly increases knowledge about hypertension, especially among seniors. enabling them to take preventive and proactive steps in managing their condition (Musyrah et al., 2024). Implementing a health management application is also effective in improving self-management knowledge and practices, especially in implementing diet, controlling blood pressure, and maintaining physical activity (Susanti et al., 2023). Educational interventions, either alone or in combination with other strategies, have been effective in improving self-management practices among hypertensive patients, leading to better blood pressure control (Ukoha-Kalu et al., 2023).

The writer's opinion states that this self-management program not only provides positive impacts physically, but also psychologically, especially in increasing participants' self-confidence and motivation to live a healthy lifestyle. With these results, it is hoped that the self-management health program can continue and be developed as a sustainable program in Talang Jambe. Synergy between the community, health workers, and local government are the key to the success of this program in efforts to prevent and control hypertension.

The implementation of self-management program for hypertension management in elderly and menopausal women in Talang Jambe, Palembang has two main limitations, namely the low level of health literacy of participants and limited resources and educational support facilities. The challenges faced are the resistance of participants in changing healthy living behavior due to old habits and minimal family support. The acceptance and implementation of new health behaviors are challenging for numerous geriatric participants who have adhered to the same dietary patterns and daily routines for decades. This phenomenon is consistent with the theory of health behavior change, which suggests that individuals are inclined to resist changing their established habits unless they perceive a significant personal risk or imminent benefit. Furthermore, cultural and socioeconomic factors are influential, as certain participants believe that hypertension is a natural part of aging rather than a condition requiring active management. As a recommendation, the program needs to use simpler and more interactive educational media, strengthen cooperation with health facilities, and form support groups (peer groups) to encourage sustainable behavior change.

CONCLUSION

The self-management education program for hypertension management among geriatric and menopausal women in Talang Jambe, Palembang effectively enhanced the knowledge and self-care practices of participants. An average reduction of 10 mmHg in systolic pressure and 7 mmHg in diastolic pressure was observed, suggesting improved hypertension control, and knowledge levels increased by 45%. Nevertheless, participants encountered significant obstacles in maintaining their self-management practices due to inadequate healthcare access and low health literacy. It is advisable to establish peer-support groups, expand collaborations with healthcare providers, and develop uncomplicated and engaging educational materials to reinforce healthy behaviors in the community in order to ensure long-term effectiveness.

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REFERENCES

- AlHadlaq, R. K., Swarelzahab, M. M., AlSaad, S. Z., AlHadlaq, A. K., Almasari, S. M., Alsuwayt, S. S., & Alomari, N. A. (2019). Factors affecting self-management of hypertensive patients attending family medicine clinics in Riyadh, Saudi Arabia. *Journal of Family Medicine and Primary Care*, 8(12), 4003–4009. https://doi.org/10.4103/jfmpc.jfmpc_752_19
- Astutik, E., Farapti, F., Tama, T. D., & Puspikawati, S. I. (2021). Differences Risk Factors for Hypertension Among Elderly Woman in Rural and Urban Indonesia. *The Yale Journal of Biology and Medicine*, 94(3), 407–415.
- Bahar, Z. (2020). Using Theory to Nursing Research. *Health Sci*, 2, 67–70.
- Barlia, G., & Putro, W. (2024). Effectiveness of Elderly Education on Level of Knowledge about Hypertension Prevention. 6(2). <https://doi.org/10.35568/healthcare.v6i2.47>
- Dhiman, S., & Chourasia, A. (2024). HYPERTENSION IN THE ELDERLY: CHALLENGES IN MANAGEMENT AND TREATMENT. *International Journal of Research -GRANTHAALAYAH*, 12. <https://doi.org/10.29121/granthaalayah.v12.i9.2024.5769>
- Fajriyah, N., Susanti, S., Iswati, I., & Geonarso, R. (2024). Implementasi Diorama 3d Interaktif Berbasis Pilar (Dio- 3d Ibp) Dalam Meningkatkan Self Management Dan Blood Pressure Control Pada Penderita Hipertensi. *Community Development in Health Journal; Volume 2, Nomor 1, April 2024*, 2(1), 48–62. <https://doi.org/10.37036/cdhj.v2i1.524>
- Figueiredo, S. N., Brites, M. J., & Sousa, J. E. (2023). Empowerment of hypertensive individuals and families in disease management: a community nursing intervention. *Pensar Enfermagem*, 27(1 SE-Original Articles), 61–72. <https://doi.org/10.56732/pensarenf.v27i1.258>
- Hamid, J. H. (2024). Knowledge of Hypertension and Related Factors Among Hypertensive Patients. *International Journal of Health Systems and Medical Sciences*, 4, 340–347. <https://doi.org/10.51699/ijhsm.v4i1.195>
- Hidayatullah, A., & Rokhmia, E. (2023). Edukasi Kegawatdaruratan Hipertensi Dalam Meningkatkan Pengetahuan Lansia Dengan Hipertensi. *Jurnal Masyarakat Mengabdikan Nusantara*, 2(3 SE-Articles), 175–182. <https://doi.org/10.58374/jmmn.v2i3.189>
- Ibrahim, & Duana, M. (2024). Predictors Of Self-Management In The Elderly With Hypertension In Aceh. *Enrichment: Journal of Multidisciplinary Research and Development*, 1–5.
- Iriana, P., Yarden, N., Sudrajat, A., Mahanani, M., & Malau, P. (2022). Knowledge as a Factor Associated with Lifestyle in Controlling Hypertension. *JURNAL INFO KESEHATAN*, 20, 183–193. <https://doi.org/10.31965/infokes.Vol20.Iss2.930>
- Jadhav, U. M., & Khilari, V. S. (2020). Hypertension in Women. *Hypertension Journal*, 6(2), 52–57. <https://doi.org/10.15713/ins.johtn.0186>
- Kemenkes BKPK. (2023). *Survei Kesehatan Indonesia*.
- Lee, C., & Shin, J. (2022). Effect of low sodium and high potassium diet on lowering blood pressure. *Journal of the Korean Medical Association*, 65, 368–376. <https://doi.org/10.5124/jkma.2022.65.6.368>
- Lin, Y. (2024). Exploring the Effects of Health Education and Chronic Disease Management Nursing in the Management of Hypertension in Elderly Patients in the Community. *Journal of Clinical and Nursing Research*, 8, 182–188. <https://doi.org/10.26689/jcnr.v8i10.8639>
- Machaalani, M., Seifeddine, H., Ali, A., Bitar, H., Briman, O., & Chahine, M. N. (2022). Knowledge, Attitude, and Practice Toward Hypertension Among Hypertensive Patients Residing in Lebanon. *Vascular Health and Risk Management*, 18, 541–553. <https://doi.org/10.2147/VHRM.S367187>
- Maluwa, C., Kapira, S., Chuljerm, H., Parklak, W., & Kulprachakarn, K. (2025). Determinants of hypertension-related knowledge, attitude, and practices (KAP) among caregivers in Neno, rural Malawi: A cross-sectional study. *Heliyon*, 11(1), e41546. <https://doi.org/10.1016/j.heliyon.2024.e41546>
- Miah, A., Haque, D. M., Alam, S., & Rahman, M. N. (2018). Knowledge, attitude and practice about hypertension among adult people of selected areas of Bangladesh. *MOJ Public Health*, 7. <https://doi.org/10.15406/mojph.2018.07.00231>
- Musyrah, A., Tira, D., Nordianiwati, N., Wijayanti, L., Sanaky, M., & Jamil, M. (2024). Health education about hypertension to increase knowledge for senior citizens. *Abdimas Polsaka*, 3, 7–13. <https://doi.org/10.35816/abdimaspolsaka.v3i1.61>
- Muthahharah, A. M., Rasdianah, R., Fitriani, A., Sutria, E., & Mildawati, T. (2024). Correlation Of Health Literacy And Self-Management Behavior Among Hypertension Clients. *Journal of Islamic Nursing*, 9(1 SE-Vol.9 No.1), 18–23. <https://doi.org/10.24252/join.v9i1.46708>
- Natrapee Jaingam, Kanchanakhon, N., & Viwattanakulvanid, P. (2024). The Effectiveness of a Self-Management and Multifactorial Program for Blood Pressure Control Among Older Home-Based Workers in Urban Bangkok, Thailand : 10.55131/jphd/2024/220311. *Journal of Public Health and Development*, 22(3 SE-Original Articles), 132–143. <https://doi.org/10.55131/jphd/2024/220311>
- Ningsih, R., Yusuf, W., Fahdhienie, F., & Septiani, R. (2024). Factors Influencing Self-Management Behavior In

- Hypertensive Patients At Lhoknga Primary Health Care. *Jukema (Jurnal Kesehatan Masyarakat Aceh)*, 10, 28–34. <https://doi.org/10.37598/jukema.v10i1.2071>
- Ruzicka, M., & Hiremath, S. (2024). Salt and Hypertension: 'Switch'ing the Focus to Potassium. In *American journal of kidney diseases : the official journal of the National Kidney Foundation* (Vol. 83, Issue 4, pp. 546–548). <https://doi.org/10.1053/j.ajkd.2023.12.001>
- Siusiuka, V. H., Vizir, V. A., Serhienko, M. Y., Demidenko, O. V., & Deinichenko, O. V. (2024). Perimenopause period and menopause: cardiovascular and metabolic risks. *Zaporozhye Medical Journal*, 26(5 SE-Review), 424–429. <https://doi.org/10.14739/2310-1210.2024.5.303438>
- Soleimani, N., Ebrahimi, F., & Mirzaei, M. (2024). Self-management education for hypertension, diabetes, and dyslipidemia as major risk factors for cardiovascular disease: Insights from stakeholders' experiences and expectations. *PLoS One*, 19(9), e0310961. <https://doi.org/10.1371/journal.pone.0310961>
- Susanti, S., Kristiani, R., Yobel, S., & Bistara, D. (2023). Pendampingan Health Management Berbasis Aplikasi Sebagai Media Self-Management Penderita Hipertensi Di Wilayah Rw 07 Kelurahan Kapasan Kecamatan Simokerto Surabaya. *Community Development in Health Journal*, 17. <https://doi.org/10.37036/cdhj.v1i1.373>
- Sutrisno, Widayati, C. N., & Radate. (2018). Hubungan Tingkat Pendidikan Dan Sikap Terhadap Perilaku Pengendalian Hipertensi Pada Lansia Di Desa Jono Kecamatan Tawangharjo Kabupaten Grobogan. *The Shine Cahaya Dunia Ners*, 3(2), 16–27.
- Sy, R. G., Llanes, E. J. B., R.Punzalan, F. E., M, J. A., Aherrera, & Cheng, P. V. C. Y. (2022). Epidemiology of Hypertension in Asia. In *Updates in Hypertension and Cardiovascular Protection ((UHCP))* (pp. 1–21). Springer Nature.
- Ukoha-Kalu, B. O., Isah, A., Biambo, A. A., Samaila, A., Abubakar, M. M., Kalu, U. A., & Soyiri, I. N. (2023). Effectiveness of educational interventions on hypertensive patients' self-management behaviours: an umbrella review protocol. *BMJ Open*, 13(8), e073682. <https://doi.org/10.1136/bmjopen-2023-073682>
- WHO. (2023). *hypertension elderly*. World Health Organization.
- Wolde, M., Azale, T., Debalkie Demissie, G., & Addis, B. (2022). Knowledge about hypertension and associated factors among patients with hypertension in public health facilities of Gondar city, Northwest Ethiopia: Ordinal logistic regression analysis. *PLoS One*, 17(6), e0270030. <https://doi.org/10.1371/journal.pone.0270030>



Optimising the business of red onion farmers through effective management and innovation of processing technologies

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-07-02 Revised: 2024-11-21 Accepted: 2025-03-02 Published: 2025-04-28 Keywords Red Onion Business Optimization Effective Management	<i>This community service journal is entitled Optimizing shallot farmers' efforts through effective management and processing technology innovation which examines methods to increase the profitability of shallot farmers through efficient management techniques and advanced processing innovations. Significant economic activities in several areas, such as Kedung Dalem Village, Dringu District, Probolinggo Regency, are extensive cultivation. This study examines the problems currently faced by farmers, such as market volatility and post-harvest losses, and suggests solutions that are largely focused on improving management practices and implementing advanced processing technologies. It is hoped that by improving managerial skills and using advanced processing techniques, shallot cultivation in the target community will become more productive, less vulnerable to losses, and ultimately more economically sustainable. The method used is a qualitative method with information interviews with informants. The results of the study emphasize the importance of combining advanced technology with efficient management techniques to improve the economic development of rural communities and agricultural sustainability.</i>
Kata Kunci Bawang Merah Optimasi Bisnis Manajemen Efektif	Mengoptimalkan usaha petani bawang merah melalui manajemen efektif dan inovasi teknologi pengolahan. Studi ini mengkaji metode untuk meningkatkan profitabilitas petani bawang merah melalui teknik manajemen yang efisien dan inovasi pengolahan yang maju. Kegiatan ekonomi yang signifikan di beberapa daerah, seperti Desa Kedung Dalem, Kecamatan Dringu, Kabupaten Probolinggo, adalah budidaya yang meluas. Penelitian ini mengkaji masalah yang saat ini dihadapi oleh petani, seperti volatilitas pasar dan kerugian pasca panen, dan menyarankan solusi yang sebagian besar difokuskan pada peningkatan praktik manajemen dan penerapan teknologi pengolahan yang maju. Diharapkan bahwa dengan meningkatkan keterampilan manajerial dan menggunakan teknik pengolahan yang maju, budidaya bawang merah di masyarakat sasaran akan menjadi lebih produktif, lebih sedikit rentan terhadap kerugian, dan pada akhirnya lebih berkelanjutan secara ekonomi. Metode yang digunakan adalah metode kualitatif dengan wawancara informasi dengan narasumber. Hasil penelitian menekankan pentingnya menggabungkan teknologi maju dengan teknik manajemen yang efisien untuk meningkatkan pembangunan ekonomi masyarakat pedesaan dan keberlanjutan pertanian. Copyright ©2025, Hariyana, et al This is an open access article under the CC-BY-SA license 
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INTRODUCTION

The production data of the plantation indicates a very good potential to be promoted, especially red garlic, because the educational level of garlic farmers who use rain-ridden plants is relatively low (Wang & Huang, 2025). The average garlic farmer in Dringu district is scattered in the village of Dringu in the province of

Probolinggo (Wu & Li, 2025). Today, the cultivation of red garlic is in great demand by many people. Despite the large amount produced, this amount is not enough to meet the needs of the farmers. It's because the farmers don't have enough knowledge and technology (Mikalef et al., 2023).

By looking at the yields and processing of garlic produced above, Probolinggo district is considered to be one of the best producers of red garlic in Eastern Java (Hariyana et al., 2024a). Because of the abundance of red garlic available during the high harvest, there are frequent fluctuations in low price drops (Fraccastoro et al., 2021). The processing of the product is usually done with the best garlic sorting. Besides, red garlic with blue lancor varieties is the one processed here (Bahtiar et al., 2022).

One of the most important pertanian sectors in Indonesia is red onion cultivation, which is practiced in Desa Kedung Dalem, Kecamatan Dringu, Kabupaten Probolinggo (Rana et al., 2025). Despite having a significant economic potential, cultivating red onion frequently faces many challenges that negatively impact their productivity and ability to continue their business (Chan et al., 2023). Red onions are one of the most easily cultivated crops in Indonesia, in addition to being planted in vast lands where red onions can also be planted on polybag (Eniola & Entebang, 2015). Some health-friendly substances are found in red onion, such as anti-cancer and antibiotic substitutes that help lower blood pressure (Bahtiar et al., 2022). One way to get this substance is through distillation (Salonen et al., 2024). Besides, the fried garlic industry continues to grow. Onions are one of the main commodities in Indonesia due to its high economic value and benefits (Yuliani & Hariyana, 2023). According to Holtikultura Agricultural Statistics (SPH), the production of red garlic in Indonesia in 2013 reached 1,010,733 tons, with Central Java being the largest province, followed by East Java and West Java (Kustin, 2021).

Optimizing the efforts of shallot farmers through effective management and technological innovation has a close relationship with several Sustainable Development Goals (SDGs) set by the UN, one of which is Industry, Innovation and Infrastructure (Chen & Lin, 2019; Burhanudin, 2024). The red garlic UMKM group located in the village of Kedungdalem, Dringu district, Probolinggo district is our partner in this community service (Hariyana et al., 2024b; van der Bend et al., 2022). This group of garlic farmers spent more than five hectares of land to plant garlic, and every great harvest they produced was rich in garlic (Cai et al., 2023). Nevertheless, garlic farmers will face some trouble if the harvest arrives (Nadliroh, 2021). One of them is the abundance of garlic, which will lower the price of sale. To overcome this problem, farmers can process it into fried garlic (Zimmermann et al., 2024; Yuliani & Hariyana, 2023; Johansson & Zhu, 2023). This will raise the sale price at the high harvest and lower the price (Hariyana et al., 2024; Syuhada & Gambett, 2013).

METHOD

The method used is a qualitative method with information interviews with sources. In Kedung Dalem Village, Dringu Prefecture, Probolinggo District, the dedication "Optimization of Red Onion Farmers' Enterprises Through Effective Management and Processing Technology Innovation" is intended to provide a comprehensive and sustainable approach to improving the well-being of red onion farmers (Bahtiar et al., 2022; Kamaludin, 2021)

Methods of Dedication Implementation: Optimizing Red Onion Farmers' Business Through Management and Innovation of Processing Technology

1. Identification and Analysis of Problems:

a. The dedication team conducted an initial study to identify the main problems faced by the onion farmers in the village of Kedung Dalem, such as market price fluctuations and post-harvest losses. b) Carry out in-depth analysis of the components that affect the efficiency and sustainability of the onions farmers' business (Cao & Weerawardena, 2023).

2. Dedication Program Planning:

(a) Defining clear and specific objectives for improving the management and technology of garlic processing.
(b) Determining appropriate strategies and methods based on problem analysis, including the selection of appropriate processing technologies and the development of training programmes for farmers.

3. Application of New Processing Technologies: (a) Discovery and delivery of better or new processing technologies to red ginger farmers. (b) Provision of assistance and training on how to use such technologies so that farmers can apply them properly (Singh, 2024).

4. Training and Management Skills Enhancement: a). Farmers can gain training on skills such as production planning, risk management, and marketing strategies. b). By using a participatory and interactive approach, you can ensure that people understand and apply the skills taught in the best way possible.

5. Performance Measurement and Evaluation:

a) Set clear performance indicators to measure the impact of dedication programmes, such as increased productivity, reduced post-harvest losses, and increased farmers' incomes (Cai et al., 2023).

b). Perform periodic evaluations to track progress and ensure that the goals of the dedication program are achieved (Ji et al., 2024).

RESULTS AND DISCUSSION

This dedication was held in the village of Kedung Dalem, Dringu district of Probolinggo with special emphasis on the Sri Rejeki UMKM group. The UMKM Group was formed by the residents of the village and is very motivated to improve the agricultural sector in the region. In Kedung Dalem Village, Dringu District, Probolinggo District, a group of farmers planted red garlic massively this year (Irtisamul et al., 2024). However, when the harvest arrived, the price of red garlic dropped drastically, putting farmers at a loss. Because of the problem, the dedication team of the Eastern Java Veterans University of National Development is planning to create a tool to help red garlic farmers, especially UMKM producers Sri Rejeki, raise the sale price of their red onions by making fried garlic with various flavors using peasants and peelers.



Figure 1. Visit to the village of Kedung Dalem in dedication



Figure 2. Visit to UMKM Sri Rejeki Roasted Red Onion Manufacturer

After the use of scissors and scrubs was carried out in the hall of the village of Kedung Dalem, the red garlic processor was handed over to Sri Rejeki UMKM. The tool was delivered on Monday, June 22, 2024, in the village hall of Kedong Dalem. The dedication team of UMKM Sri Rejeki of the National Development University of Veterans of East Java and members of the Department of the Village and the Village of Kedung Dalem attended the meeting. The following picture shows a demonstration of the tool, followed by a photo of the village device and Sri Rejeki UMKM.



Figure 3. practical activities of the use of the red garlic plumper and its peelers



Figure 4. Exercise photos of red fried garlic products

There are several devotional actions that can be performed when using a separator and a garlic peel:

1. Introduction of Thresher and Skin Separator Tools:

The service team will introduce farmers to the onion thresher and skin separator tools, which are designed to help speed up the process of separating shallot skin from the tubers, which is usually done manually.

2. Tool Use Instruction:

Farmers will be instructed on the proper and effective use of threshing and skin-separating instruments. Basic maintenance, safe handling techniques, and tool use will all be covered in this session.

3. Hands-on Instruction: The service team will conduct a hands-on instruction session on the proper usage of a shallot skin separator and thresher in the field. Farmers will be able to observe directly how the gadget operates and the advantages it offers in terms of improving productivity.

4. Testing and Adjustment: After the demonstration, farmers will be invited to try using the tool directly. The team will monitor and provide guidance when needed, as well as make adjustments so that the tools can function optimally according to local conditions and farmers' needs.

5. Evaluation and Feedback: The team will conduct joint evaluations with farmers to collect feedback on the use of threshers and skin separators. This includes checking the effectiveness of the tool in reducing time and labor, as well as identifying areas of improvement if any.

6. Capacity Development: Apart from using tools, this activity also aims to increase farmers' capacity to adopt new technology. The team will provide additional information about the technology's benefits, best practices, and potential for improving outcomes.

Through this practical activity, it is hoped that the service can make a real contribution in increasing the efficiency and sustainability of the shallot cultivation business in Kedung Dalem Village. By introducing this technology, farmers are expected to reduce post-harvest losses, increase the added value of products, and increase their overall income.

During the practice of using the tool, members of the village device and the UMKM of Sri Rejeki were invited to ask questions regarding the tool used by the practitioner so that they understood how to use the tool properly (Aldhamiri et al., 2024; Saulite et al., 2022).

CONCLUSION

This service activity has increased the efficiency and sustainability of shallot farmers' businesses in Kedung Dalem Village, Dringu District, Probolinggo Regency. Through the implementation of more effective management, such as production planning, risk management, and marketing strategies, farmers can better manage their businesses. In addition, innovations in processing technology, such as modern skin separators and better packaging methods, reduce post-harvest losses and increase the added value of products. As a result, farmers' productivity and income have increased, and the sustainability of their businesses has been maintained. This activity also empowers farmers by improving their technological capabilities and managerial skills, as well as the importance of ongoing support to ensure long-term benefits for the farming community in the area.

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REFERENCES

- Aldhamiri, A., Carlson, J., Vilches-Montero, S., Rahman, S. M., & Gudergan, S. P. (2024). What drives higher active customer engagement in luxury brands' social media? Measurement and contingencies. *Journal of Retailing and Consumer Services*, 79. <https://doi.org/10.1016/j.jretconser.2024.103804>
- Bahtiar, A.H., Arifin, M., Muhaimin, M., Tinggi, S., Islam, A., & Probolinggo, M. (2022). Pengolahan bawang merah goreng untuk meningkatkan perekonomian masyarakat di Desa Tegalrejo. *Development Journal of Community Engagement*, 1(2), 65-76. <https://doi.org/10.46773/djce.v1i2.317>
- Nadliroh, K., Fauzi, A.S., Mahmudi, H., Rozi, M.B., Apririo, K.F. (2021). Optimalisasi petani bawang merah melalui alat pengolah bawang merah 3 in 1. *Jurnal Pengabdian Masyarakat Nusantara (Dimastara)* 2, 1(1), 1-6. <https://doi.org/10.29407/dimastara.v1i1.16906>
- Burhanudin, B. (2024). Managing social commerce: does customer review quality matter? *Procedia Computer Science*, 234, 1459–1466. <https://doi.org/10.1016/j.procs.2024.03.146>
- Cai, X., Cebollada, J., & Cortiñas, M. (2023). Impact of seller- and buyer-created content on product sales in the electronic commerce platform: The role of informativeness, readability, multimedia richness, and extreme valence. *Journal of Retailing and Consumer Services*, 70. <https://doi.org/10.1016/j.jretconser.2022.103141>
- Cao, G., & Weerawardena, J. (2023). Strategic use of social media in marketing and financial performance: The B2B SME context. *Industrial Marketing Management*, 111, 41–54. <https://doi.org/10.1016/j.indmarman.2023.03.007>
- Chan, I. C. C., Chen, Z., & Leung, D. (2023). The more the better? Strategizing visual elements in social media marketing. *Journal of Hospitality and Tourism Management*, 54, 268–289. <https://doi.org/10.1016/j.jhtm.2022.11.007>
- Chen, S. C., & Lin, C. P. (2019). Understanding the effect of social media marketing activities: The mediation of social identification, perceived value, and satisfaction. *Technological Forecasting and Social Change*, 140, 22–32. <https://doi.org/10.1016/j.techfore.2018.11.025>
- Eniola, A. A., & Entebang, H. (2015). SME Firm Performance-Financial Innovation and Challenges. *Procedia - Social and Behavioral Sciences*, 195, 334–342. <https://doi.org/10.1016/j.sbspro.2015.06.361>
- Fraccastoro, S., Gabrielsson, M., & Pullins, E. B. (2021). The integrated use of social media, digital, and traditional communication tools in the B2B sales process of international SMEs. *International Business Review*, 30(4). <https://doi.org/10.1016/j.ibusrev.2020.101776>
- Hariyana, N., Izaak, W. C., & Sholihah, R. (2024). Consumer Responses to Scarcity Appeals in Online Ordering. 403–408. <https://doi.org/10.11594/nstp.2024.4166>
- Hariyana, N., Takarini, N., & Mandasari, V. (2024a). Creative elderly productive elderly flower arranging activities with the elderly in Manukan. 202–206. <https://doi.org/10.11594/nstp.2024.4131>
- Hariyana, N., Takarini, N., & Mandasari, V. (2024b). Creative elderly productive elderly flower arranging activities with the elderly in Manukan. 202–206. <https://doi.org/10.11594/nstp.2024.4131>
- Irtisamul, S., Hassan, M. B., Sadia, F., Hasan, M., & Rokonzaman, M. (2024). Understanding Consumer Perceptions of Green Software: A Study in the Online Social Media Marketing Context. *Procedia Computer Science*, 237, 775–782. <https://doi.org/10.1016/j.procs.2024.05.165>
- Ji, E., Mahmudur Rahman, S., Wilden, R., Lin, N., & Harrison, N. (2024). Leveraging customer knowledge obtained through social media: The roles of R&D intensity and absorptive capacity. *Journal of Business Research*, 182. <https://doi.org/10.1016/j.jbusres.2024.114811>

- Johansson, A. C., & Zhu, Z. (2023). Reputational assets and social media marketing activeness: Empirical insights from China. *Electronic Commerce Research and Applications*, 61. <https://doi.org/10.1016/j.elerap.2023.101305>
- Kamaludin, K. & Wahyuningsih, S. (2021). Analisis pengelolaan modal usaha dalam rangka meningkatkan taraf kehidupan ekonomi petani bawang merah dengan menggunakan media tanam sawah tadah hujan analysis of business capital management to improve the economic life of shallot farmers by using the media to plant rain-ed rice fields. *Journal of Economics and Accounting (Costing)*, 5(1), 1-12. <https://xjournals.com/collections/articles/Article?qt=7PzlpVggCvea+kXIRpdER+a/m8Ta+i9L/W4/94ozGxJKOpQGteaJ4Zoh0EuUYblm0bVa+JjdGsykXMWcPlJyGw==>
- Kustin, K. (2021). Peningkatan pemberdayaan keluarga dalam upaya pencegahan stunting melalui taman gizi di Kelurahan Sumbersari Kabupaten Jember. *INDRA: Jurnal Pengabdian Kepada Masyarakat*, 2(1), 30–36. <https://doi.org/10.29303/indra.v2i1.82>
- Mikalef, P., Islam, N., Parida, V., Singh, H., & Altwaijry, N. (2023). Artificial intelligence (AI) competencies for organizational performance: A B2B marketing capabilities perspective. *Journal of Business Research*, 164. <https://doi.org/10.1016/j.jbusres.2023.113998>
- Rana, Md. M., Siddiquee, M. S., & Uddin, Md. A. (2025). The service quality imperative: Sustaining ridesharing adoption in the developing world. *Research in Transportation Business & Management*, 59, 101289. <https://doi.org/https://doi.org/10.1016/j.rtbm.2025.101289>
- Salonen, A., Mero, J., Munnukka, J., Zimmer, M., & Karjaluo, H. (2024). Digital content marketing on social media along the B2B customer journey: The effect of timely content delivery on customer engagement. *Industrial Marketing Management*, 118, 12–26. <https://doi.org/10.1016/j.indmarman.2024.02.002>
- Saulite, L., Ščeulovs, D., & Pollák, F. (2022). The influence of non-product-related attributes on media brands' consumption. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(3). <https://doi.org/10.3390/joitmc8030105>
- Singh, P. (2024). Beyond the basics: Exploring the impact of social media marketing enablers on business success. *Heliyon*, 10(5). <https://doi.org/10.1016/j.heliyon.2024.e26435>
- Syuhada, A. A., & Gambett, W. (2013). Online marketplace for Indonesian micro small and medium enterprises based on social media. *Procedia Technology*, 11, 446–454. <https://doi.org/10.1016/j.protcy.2013.12.214>
- van der Bend, D. L. M., Jakstas, T., van Kleef, E., Shrewsbury, V. A., & Bucher, T. (2022). Making sense of adolescent-targeted social media food marketing: A qualitative study of expert views on key definitions, priorities and challenges. *Appetite*, 168. <https://doi.org/10.1016/j.appet.2021.105691>
- Wang, S., & Huang, Z. (2025). Trust transfer in the adoption of autonomous last mile services toward digital urban system. *Digital Engineering*, 5, 100030. <https://doi.org/10.1016/j.dte.2024.100030>
- Wu, G., & Li, Y. (2025). Tax-related information regulatory capacity and enterprise accounting information quality. *International Review of Financial Analysis*, 103929. <https://doi.org/10.1016/J.IRFA.2025.103929>
- Yuliani, H. R., & Hariyana, N. (2023). The Influence of the amount of raw materials and labor on the level of industrial income at UD Setya Abadi D.M Findings. In *Journal of Social Sciences and Culture (Issue 2)*.
- Zimmermann, S., Dauter, J., & Gewald, H. (2024). Promoting sports and wellness with social media advertising - an analysis of different marketing channels. *Procedia Computer Science*, 231, 311–316. <https://doi.org/10.1016/j.procs.2023.12.209>



Community empowerment through the eco-mosque program at the Ali Bin Abi Tholib Mosque Sorong

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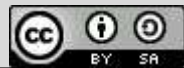
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ARTICLE INFO	ABSTRACT
Article history Received: 2024-09-27 Revised: 2025-03-13 Accepted: 2025-04-07 Published: 2025-04-28 Keywords Eco-mosque Environmentally friendly mosque Mosque-based empowerment Waste management Kata Kunci Eko masjid Masjid ramah lingkungan Pemberdayaan berbasis masjid Pengelolaan limbah	<i>The Ali Bin Abi Thalib Mosque is a mosque that stands as a form of awareness of the Muhammadiyah organization in empowering the community. The primary problem lies in the environmentally unfriendly practices of its non-formal educational institutions. to enhance the partners' skills in rainwater harvesting and waste management so that the mosque has an environmentally friendly nuance. Participants are 20 young mosque guards. The Implementation program includes strengthening character education and environmental care movements and rainwater management for mosque guards and teenagers. These community service activities include: preparation, implementation, application of science and technology, and evaluation. This community service resulted in an increased sense of environmental responsibility among the mosque caretakers and teenagers.</i> Pemberdayaan masyarakat melalui program eko masjid pada masjid Ali bin Abi Tholib Sorong. Masjid Ali Bin Abi Tholib adalah masjid yang berdiri sebagai bentuk kesadaran organisasi Muhammadiyah dalam pemberdayaan masyarakat. Permasalahan yang paling mendasar adalah kehadiran lembaga pendidikan nonformal belum berorientasi pada gerakan ramah lingkungan. Tujuan dari kegiatan pengabdian masyarakat ini adalah untuk memberikan peningkatan keterampilan mitra tentang pengelolaan air hujan dan pengelolaan sampah sehingga masjid bernuansa ramah lingkungan. Peserta adalah penjaga remaja masjid yang berjumlah 20 orang. Dalam program penerapan meliputi penguatan pendidikan karakter dan gerakan peduli lingkungan dan pengelolaan air hujan kepada penjaga dan remaja masjid. Kegiatan pengabdian masyarakat ini meliputi: persiapan, pelaksanaan, penerapan sains dan teknologi, dan evaluasi. Hasil pengabdian ini adalah karakter cinta lingkungan para penjaga dan remaja masjid meningkat. Copyright © 2025, Santoso, et al This is an open access article under the CC-BY-SA license 
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INTRODUCTION

In the contemporary technological industry, environmental education represents a fundamental pillar of societal life. In the modern era, humans require virtuous values, skills, and knowledge as an urgent and immediate necessity. Education serves as the optimal conduit for fulfilling these needs. This encompasses both formal and non-formal educational avenues (Masgumelar & Mustafa, 2021; Santoso, Triono, Muhammad, et al., 2024). The element of education occupies a position that is no less important than other elements such as economic, social and political and human rights (Santoso, In'am, Haris, et al., 2024; Sulasmi, 2019). Furthermore, education plays an important role in instilling awareness

(Adnyana et al., 2023; Hnatyuk et al., 2024; Oyeleke & Onyike, 2025; Sarti & St. John, 2019) and responsibility for environmental protection (Harahap & Uthman, 2024; Vladova, 2023). Education is also expected to equip individuals with practical skills to play an active role in environmental conservation efforts (Brahma, 2025; Fayyaz et al., 2023).

Green mosques are generally defined based on four main principles: preserving the environment, cutting costs, improving the quality and health of the learning environment, and integrating learning possibilities with nature. According to the Regulation of the Minister of Environment Number 05 of 2013, there are four indicators that must be considered in implementing green schools: strengthening environmentally friendly school regulations, creating a curriculum that emphasizes environmental concepts, strengthening environmental projects with active involvement, improving and managing environmentally friendly educational facilities (Junaidah et al., 2025; Syofyan et al., 2021).

Furthermore, the 2020 Indonesian Environmental Status (SLHI) book was compiled based on data from the Ministry of Environment and Forestry (KLHK) with the objective of providing a comprehensive overview of the environmental conditions in Indonesia. This information serves as a foundation for all parties to assess, conduct research on, and develop policies that consider environmental aspects in accordance with the principles of sustainable development. It is imperative to consider environmental aspects in accordance with the principles of sustainable development. In 2019, the total area of Indonesia's land was 187.8 million hectares, distributed across six major island groups/archipelagos (ecoregions) or 34 provinces. The Indonesian landmass is divided into forested and non-forested areas. Forested areas encompass 94.1 million hectares, representing 50.0% of the total land area. Non-forested areas, in contrast, cover 93.6 million hectares. This distribution has remained relatively consistent over the past five years (2014-2019) (Khunaini, 2020). The extent of Indonesia's forested land area exhibited a decline from 95.7 hectares in 2014 to 94.1 hectares in 2019. One of the primary causes of the reduction in forested land area during this period is the destruction of forests resulting from alterations in their function and designation (Santoso et al., 2021, 2023).

The partner group of Pimpinan Cabang Muhammadiyah Aimas an association that was established with the objective of empowering the community in Aimas, Sorong Regency. One of the primary objectives of its establishment is to facilitate the realization of the goals of Muhammadiyah in the Aimas District of Sorong Regency. To date, the empowerment initiatives have encompassed congregational prayer, routine recitation, community service, and non-formal learning for children, specifically Al-Qur'an education (interview results).

Following the completion of observations and interviews, it has become evident that the primary challenge currently facing empowerment initiatives is the necessity to extend empowerment to partners in both social and management aspects. With regard to the issue of empowering partners in the social domain, it is evident that there is a dearth of awareness among partners regarding the imperative of environmental stewardship, particularly in the context of the mosque. This has resulted in a lack of environmental sensitivity within the mosque, which is not conducive to a harmonious relationship with the environment. This is exemplified by the Ali Bin Abi Tholib mosque, where the current arrangement for ablution water permits the wasteful utilization of clean water. The groundwater quality data from boreholes in Sorong City and Regency indicates a poor quality of water due to the high oil content in the region. This is not in accordance with the requisite standards for potable water quality, including those pertaining to its physical, chemical, microbiological, and radiochemical composition. The availability of clean water in Aimas, Sorong Regency is constrained. To obtain potable water, the mosque administrators utilize rainwater that is collected. The situation at Al-Ardi Mosque is somewhat distinct. In order to take ablution water, the congregation is required to use a bucket, which will undoubtedly result in greater water wastage. Furthermore, this method facilitates the integration of impurities into the water, rendering it unholy and impure for ablutionary purposes.

Furthermore, a dearth of knowledge has resulted in the availability of trash bins in the mosque area, yet these have not been employed in an optimal manner. Despite the presence of trash bins, a considerable amount of litter remains scattered around the mosque premises. To date, there has been no socialization from the relevant agencies. Therefore, in the absence of efforts to enhance its management, the current lack of awareness is likely to persist and potentially even intensify over time (Abda'u et al., 2020; Santoso et al., 2023). The proper management of organic waste can facilitate its utilization and processing as fertilizer, which can enhance the value of the mosque congregation (Abdulatif & Dewi, 2021); (Santoso, Triono, & Irawan, 2024). According to data from BPS Sorong Regency, the waste transportation infrastructure in Aimas District is only capable of transporting 9.5 m³/day, despite the fact that the waste generated is significantly higher, at 29.41 m³/day (Untari, 2022).

The next problem is the need for aspects of partner empowerment in the management aspect. The aspect of management based on the eco-mosque can be seen from not being managed properly. Whereas the mosque garden is in terms of ecological functions, as a green open space it functions as an air conditioning device, oxygen producer, noise reducer, and also acts as a visual controller / view control, namely by reducing sunlight or reflected light. Even the mosque garden can be used to grow vegetables that can have added value for worshipers. In addition to greening management, this service will improve management improvement in the field of waste management and clean water improvement.

The purpose of this community service is to provide an understanding and also practice of eco-mosques at the Ali bin Abi Thalib mosque. The understanding activity is carried out by gathering mosque congregations and continued with the practice of rainwater harvesting and waste management for mosque administrators and congregations. This community service program is related to the goals of sustainable development or Sustainable Developments Goals SDG'S, namely

point 8, namely Strengthening the alignment of harmonious life with the environment, nature and culture. As well as increasing tolerance between religious communities to achieve a just and prosperous society.

METHOD

The methodology employed in this program entails a direct approach, comprising the following stages: firstly, the identification of the problem. The identification of the program's problems was conducted through field observations and in-depth interviews with partners. Among the numerous issues identified, a select few were deemed fundamental and imperative for immediate resolution (Triono & Santoso, 2024). The findings resulting from the identification of problems will be subjected to further investigation.

The second stage is preparation, which encompasses the formulation of strategic action plans, the collection of data and information, and the planning of preparatory activities. This stage comprises a number of activities, including the appointment of a section head by the team leader, who will be responsible for the implementation of the service work programme. In this preparatory phase, the team convened to conduct coordination meetings, which were primarily oriented towards the planning of service activities.

The third stage is the implementation of the community service program, which entails the provision of workshops and the implementation of IPTEKS for partners. Subsequent to the completion of the implementation phase, the evaluation stage is initiated. The evaluation of this activity will be conducted with the objective of determining the effectiveness and efficiency of implementing community service activities for partners. The evaluation is conducted by two teams, namely: The Internal Evaluation Team is comprised of members from the Directorate General of Higher Education, Research and Technology, while the External Evaluation Team is constituted by representatives from the Directorate General of Vocational Education. Moreover, in this concluding phase, the community service and team will fulfil the outputs outlined in the research proposal.

The community services were conducted in eight months, starting from March 2023 to October 2023. To implement the community services, there were several stages including analysis, design, development, and implementation. The details are in Figure 1.



Figure 1. The stages in conducting community service program

RESULTS AND DISCUSSION

Pre-implementation

The identification of the program's problems was conducted through field observations and in-depth interviews with mosque managers. Among the various issues identified in partner schools, several were deemed fundamental and critical, necessitating prompt resolution. The results of the problem identification process yielded findings that will be addressed in this community service program. Specifically, the community empowerment program at the Ali bin Abi Tholib Mosque is currently not environmentally friendly. The subsequent phase of the project will entail the formulation of a community service program, which will be implemented in collaboration with the expertise of the community service team and the partners. The program will address two key areas: organic waste management and rainwater harvesting.

Preparation

This stage encompasses the entirety of the activity plan strategy compilation process, the collection of data and information, and the planning of pre-activity activities. This stage comprises a series of activities, during which the team leader appoints the head of the section, who will assume responsibility for the implementation of the community service work program. In this preparatory phase, the team convenes for a coordination meeting, during which the specifics of the community service activities are discussed and planned. The initial step is the management of organic waste through the utilization of a straightforward composter. The outcome of this undertaking is an enhancement of the competencies of the mosque's security personnel and the younger members of the congregation.

Implementation

The implementation of community service is divided into two, namely workshops and technology applications. workshop activities are divided into two, namely knowledge about rainwater harvesting and knowledge about organic waste management. The first community service activity was a workshop aimed at increasing partners' knowledge about the eco-mosque concept (Figure 2).



Figure 2. Implementation programs

The activity was subsequently carried out in a practical setting, whereby the principles of science and technology were applied in a real-world context (Figure 2). The initial technology is a basic composter that functions to recycle organic waste into organic fertilizer, which can then be used to fertilize the soil.



Figure 3. organic waste management practices

In the program depicted in the above image, partners assume a significant role. Following their training on composter operation, they are responsible for continuously adding organic kitchen waste to the composter in alternating morning and evening batches. At the outset of the program, participants received guidance from a community service team on the proper operation of the composter. Subsequently, the participants will engage in practical exercises. The process begins with the separation of organic and non-organic waste. Once the composter is full, it is left for approximately one month. Subsequently, the students must open the composter and select the waste that has undergone composting. This waste is then separated, and the compost is ready to be used as an organic fertilizer.



Figure 4. Rainwater harvesting equipment

The final element is the implementation of rainwater harvesting technology (Figure 4). The objective of this IPTEKS is to facilitate the reuse of rainwater by the congregation as a source of ablution water.

Evaluation

The evaluation of this activity will be carried out to determine the effectiveness and efficiency of implementing community service activities for partners. The evaluation is carried out by two teams, namely: the Internal Evaluation Team and the External Evaluation Team by the Directorate General of Higher Education, Research and Technology of the Directorate General of Vocational Education.

The eco-mosque implementation initiative at the Ali Bin Abi Tholib Mosque in Sorong has demonstrated that community involvement in managing the environment can be encouraged through faith-based organizations. The mosque, which is the center of worship for the Muslim community, not only plays a role in building the spirituality of the congregation but also promotes socio-environmental values (As-Salafiyah et al., 2024; Marlina et al., 2023; Sunesti & Zunariyah, 2024). Integrating character education through empowering mosque youth will encourage the creation of an environmentally friendly society, which attitude is then rooted in ethical and spiritual values. By training mosque youth to be involved in water harvesting and waste management, it will increase their involvement in various ecological literacy practices that are in line with the SDGs.

Community-based environment programs will be more effective if these programs are packaged in line with the local nature of the community. The increase in environmental responsibility of mosque youth reported in this community service activity also confirms the effectiveness of experiential learning strategies and peer-led initiatives. Furthermore, the integration of Islamic environmental ethics is in line with the role of religion in overcoming various human problems. Environmental damage is an important problem that affects human well-being. In line with that, Islam also teaches the importance of preserving the environment (As-Salafiyah et al., 2024). Rainwater harvesting is an environmentally friendly project that requires low costs and a sustainable approach to preserving water sources (Pala et al., 2021; Richards et al., 2021). The success of this project is not only based on technical aspects, but also on the participation and acceptance of the surrounding community.

CONCLUSION

It is imperative that educational institutions, including non-formal educational institutions such as mosques, implement environmental conservation programs. The implementation of an effective eco-mosque program is likely to yield positive outcomes for both the mosque itself and the surrounding environment. The results of this community service will foster an attitude of environmental stewardship, as participants gain direct experience and habituation to environmental practices. This signifies that memorable learning entails the practice of preserving the environment within the mosque setting, in addition to formal education.

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REFERENCES

- Abda'u, I. F., Mutakin, A., & Setiawan, A. Y. (2020). Pengelolaan lingkungan berbasis pesantren (ekopesantren) dalam menciptakan perilaku santri yang ramah lingkungan di Ponpes Baiturrahman Kec. Cipary. *Geoarea*, 3(2), 28–39. <https://doi.org/https://ejournal.unibba.ac.id/index.php/Geoarea/article/view/645>
- Abdulatif, S., & Dewi, D. A. (2021). Peranan pendidikan kewarganegaraan dalam membina sikap toleransi antar siswa. *Jurnal Pendidikan Dan Pengajaran Guru Sekolah Dasar*, 04(2), 103–109. <https://ojs.uma.ac.id/index.php/jppuma/article/download/563/403>
- Adnyana, I. M. D. M., Mahendra, K. A., & Raza, S. M. (2023). The importance of green education in Indonesia: An analysis of opportunities and challenges. *Education Specialist*, 1(2), 61–68. <https://doi.org/10.59535/es.v1i2.168>
- As-Salafiyah, A., Uula, M. M., & Taufiq, M. (2024). Mosque and environmental issues: A research path analysis. *Journal of Islamic Economics Literatures*, 5(1). <https://doi.org/10.58968/jiel.v5i1.541>
- Brahma, R. (2025). Innovations In teaching and learning for environmental education. *Journal of the American Institute*, 2(2), 210–224. <https://doi.org/10.71364/kxrd4r73>
- Fayyaz, S., Lashari, A. Al., Nandwani, S., & Chang, M. A. (2023). Assessing environmental awareness and conservation behavior in schools for sustainable development. *Pakistan Journal of Humanities and Social Sciences*, 11(4), 4070–4081. <https://doi.org/10.52131/pjhss.2023.1104.0675>
- Harahap, D., & Uthman, Y. O. O.-O. (2024). Bridging the gap: Environmental education as a catalyst for human-environmental harmony. *Assyfa Learning Journal*, 2(1), 19–39. <https://doi.org/10.61650/alj.v2i1.186>
- Hnatyuk, V., Pshenychna, N., Kara, S., Kolodii, V., & Yaroshchuk, L. (2024). Education's role in fostering environmental awareness and advancing sustainable development within a holistic framework. *Multidisciplinary Reviews*, 7, 2024spe012. <https://doi.org/10.31893/multirev.2024spe012>
- Junaidah, J., Mahardika, N. P., & Ma'arif, M. A. (2025). Promoting green madrasa as environmental education program: How to implement and maintain it. *Munaddhomah: Jurnal Manajemen Pendidikan Islam*, 6(1), 39–54. <https://doi.org/10.31538/munaddhomah.v6i1.1572>
- Khunaini, F. (2020). Program zero waste sebagai implementasi pendidikan cinta lingkungan di PPA Lubangsa Utara. *Ar-Risalah: Media Keislaman, Pendidikan Dan Hukum Islam*, 3(2), 20–32. <https://jurnal.instika.ac.id/index.php/jpik/article/view/166>
- Marlina, A., Khan, H. A., Cahyadi, A., Subandoyo, A., & Barkah, A. S. (2023). The role of mosques in managing flood natural disasters through environmental education. *Proceeding of International Conference on Education*, 1–9. <https://doi.org/10.37640/ice.02.730>
- Masgumelar, N. K., & Mustafa, P. S. (2021). Teori belajar konstruktivisme dan implikasinya dalam pendidikan dan pembelajaran. *Ghaitsa*, 2(2), 49–57. <https://doi.org/10.62159/ghaitsa.v2i1.188>
- Oyeleke, A. S., & Onyike, I. E. (2025). Strategies to instil environmental consciousness and commitment in future generations. In *Media and Communication Systems for Sustainability in Nigeria* (pp. 145–160). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-75221-6_7
- Pala, G. K., Pathivada, A. P., Velugoti, S. J. H., Yerramsetti, C., & Veeranki, S. (2021). Rainwater harvesting - A review on conservation, creation & cost-effectiveness. *Materials Today: Proceedings*, 45, 6567–6571. <https://doi.org/10.1016/j.matpr.2020.11.593>
- Richards, S., Rao, L., Connelly, S., Raj, A., Raveendran, L., Shirin, S., Jamwal, P., & Helliwell, R. (2021). Sustainable water resources through harvesting rainwater and the effectiveness of a low-cost water treatment. *Journal of Environmental Management*, 286, 112223. <https://doi.org/10.1016/j.jenvman.2021.112223>
- Santoso, B., In'am, A., Haris, A., & Wekke, I. S. (2024). Al-Islam and Kemuhammadiyah learning based on religious moderation in multicultural campus. *Al-Hayat: Journal of Islamic Education (AJIE)*, 10(1), 137–146. <https://doi.org/10.35723/ajie.v8i1.432>
- Santoso, B., Tang, A., & Jumadi, J. (2021). Pengelolaan lingkungan berbasis pesantren (ekopesantren) dalam menciptakan perilaku santri yang ramah lingkungan di Ponpes Baiturrahman Kec. Cipary. *Jurnal Penelitian Pendidikan*, 13(2), 1896–1904. <https://ejournal.unibba.ac.id/index.php/Geoarea/article/view/645>
- Santoso, B., Triono, M., & Irawan, M. H. (2024). Pemberdayaan masyarakat Papua Melalui program ekopesantren berbasis pelestarian lingkungan di Panti Asuhan Muhammadiyah Malasom. *Abdimasa*, 7(1), 34–40. <https://unimuda.e-journal.id/jurnalabdimasa/article/view/4851>

- Santoso, B., Triono, M., Muhammad, A. S. A., & Arifin, S. (2024). The readiness of islamic religious education teachers to enter the era of industrial society 5.0. *Tafkir: Interdisciplinary Journal of Islamic Education*, 5(4), 624–636. <https://doi.org/10.31538/tijie.v5i4.1183>
- Santoso, B., Triono, M., Muzakki, M., Lestari, L., & Jaharudin, J. (2023). Learning model of al-islam and integrative muhammadiyah for students at MTs Muhammadiyah Aimas. *ISTAWA: Jurnal Pendidikan Islam (IJPI)*, 8(1), 40–53. <https://doi.org/https://journal.umpo.ac.id/index.php/istawa/article/view/7436>
- Sarti, M., & St. John, S. K. (2019). Raising long-term awareness: EU environmental policy and education. In *Education and Public Policy in the European Union* (pp. 165–181). Springer International Publishing. https://doi.org/10.1007/978-3-030-04230-1_8
- Sulasmi, E. (2019). *Konsep pendidikan humanis dalam pengelolaan pendidikan*. <https://www.scribd.com/document/556132209/Konsep-Pendidikan-Humanis-Dalam-Pengelolaan-Pendidikan-Di-Indonesia-by-Dr-Emilda-Sulasmi-M-pd-Z-lib-org>
- Sunesti, Y., & Zunariyah, S. (2024). Religious-based environmental movement: Mosque as a center of environmental awareness initiatives in Code River Yogyakarta. *E3S Web of Conferences*, 595, 03006. <https://doi.org/10.1051/e3sconf/202459503006>
- Syofyan, H., Rosyid, A., Febrianti, N., & Ratih, R. (2021). The character of responsibility and honesty: Its impact on science learning outcomes. *International Journal of Elementary Education*, 6(1), 74–87. <https://doi.org/10.23887/ijee.v6i1.41353>
- Triono, M., & Santoso, B. (2024). Character development through religious education through mathematics education in elementary school. *Qalam*, 12(1), 57–62. <https://doi.org/10.33506/jq.v13i1.3300>
- Untari. (2022). Analisis nilai TDS (total dissolve solid) pada air kota dan kabupaten sebagai gambaran kualitas air sumur bor. *Analit: Analitical and Environmental*, 7(2), 8–20. <https://doi.org/10.23960/aec.v7i02.2022.p115-121>
- Vladova, I. (2023). Towards a more sustainable future: The importance of environmental education in developing attitudes towards environmental protection. In B. Stoykova & D. Stoyancheva (Eds.), *SHS Web of Conferences* (Vol. 176, p. 01009). <https://doi.org/10.1051/shsconf/202317601009>



Enhancing the well-being of high school students through comprehensive reproductive health education

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-07-27 Revised: 2025-03-13 Accepted: 2025-03-17 Published: 2025-04-28 Keywords Adolescents Counseling Health Education High School Students Reproductive Health	The improvement of adolescent reproductive health is a crucial issue in supporting the well-being of the younger generation. This activity aimed to enhance high school students' knowledge of reproductive health through counseling using lectures and booklet distribution. The program was conducted at a high school in Malang City, involving 45 eleventh-grade students. The methods used included a pre-test, lecture, booklet distribution, and a post-test. The analysis results showed a significant increase in students' knowledge of reproductive health after the intervention, with the pre-test score rising from 24.13±1.74 to a post-test score of 28.64±0.77 (p=0.000). This counseling session successfully raised adolescents' awareness and knowledge of reproductive health, helping prevent issues such as sexually transmitted infections and early pregnancies. The use of booklets proved to be an effective medium for delivering accurate and comprehensive information on reproductive health.
Kata Kunci Remaja Penyuluhan Pendidikan Kesehatan Siswa SMA Kesehatan Reproduksi	Optimalisasi kesehatan siswa sekolah menengah atas melalui pendidikan kesehatan reproduksi. Peningkatan kesehatan reproduksi remaja merupakan isu penting dalam mendukung kesejahteraan generasi muda. Kegiatan ini bertujuan untuk meningkatkan pengetahuan siswa SMA tentang kesehatan reproduksi melalui penyuluhan dengan metode ceramah dan pembagian booklet. Kegiatan ini dilaksanakan di salah satu SMA di Kota Malang, diikuti oleh 45 siswa kelas XI. Metode yang digunakan adalah pre-test, ceramah, pembagian booklet, dan post-test. Hasil analisis menunjukkan peningkatan signifikan dalam pengetahuan siswa mengenai kesehatan reproduksi setelah intervensi, dari nilai pre-test 24.13±1.74 menjadi nilai post-test 28.64±0.77 (p=0.000). Penyuluhan ini berhasil meningkatkan kesadaran dan pengetahuan remaja tentang kesehatan reproduksi, sehingga dapat mencegah masalah seperti infeksi menular seksual dan kehamilan pada usia muda. Penggunaan media booklet terbukti efektif dalam menyampaikan informasi yang akurat dan komprehensif mengenai kesehatan reproduksi.
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INTRODUCTION

According to the Central Statistics Agency (BPS) of Indonesia, the country had a population of 278.7 million in mid-2023, with a significant youth population of 44 million adolescents (Badan Pusat Statistik, 2023). The World Health Organization (WHO) defines adolescence as the period between childhood and adulthood, spanning ages 10 to 19 (World Health Organization, 2024). This developmental stage is critical for establishing a foundation for good health, yet it is also marked by heightened health risks, particularly those related to sexual behavior (Purnamawati et al., 2024).

Reproductive health issues among Indonesian adolescents are prevalent. Data indicate that high school students face a range of reproductive health challenges (Nursanti et al., 2022), including reproductive organ infections, sexually transmitted infections (STIs), and unintended pregnancies (Vaina & Perdikaris, 2022). A survey conducted by the Indonesian Ministry of Health revealed a concerning lack of knowledge among adolescent girls, with 13% unaware of their physical changes and 47.9% uncertain about the female fertile period (Afifah et al., 2021). Research has consistently linked inadequate reproductive health knowledge to elevated rates of teenage pregnancy (Simatupang, 2018).

High school students possess only low to moderate levels of reproductive health knowledge (Bunga et al., 2021), encompassing critical areas such as contraception and HIV/AIDS prevention (Putri et al., 2022). The implications of this knowledge gap are far-reaching, affecting both individuals and communities (Ahmad & Karim, 2019). A strong understanding of reproductive health is essential for preventing undesirable outcomes such as early marriage, premarital sex, teenage pregnancy, STIs, and HIV infection (Meilani et al., 2023; Putri et al., 2023).

Empowering adolescents with comprehensive reproductive health education is crucial for improving overall adolescent health (Rahmadania et al., 2024; Setyandari & Rahayuningsih, 2023) and reducing the incidence of unintended pregnancies, abortions, and STIs (Namukisa et al., 2023; Wang et al., 2023). Health promotion, encompassing efforts to raise community awareness and foster behavior change, is key to addressing this issue (Nurmala et al., 2018). One effective strategy involves providing reproductive health education through counseling and informational materials such as booklets and leaflets (Utaminingtyas et al., 2024). As part of a community service initiative, a counseling intervention was specifically designed and implemented at a high school in Malang City to enhance students' reproductive health knowledge. This program aimed to equip students with accurate information and empower them to make informed decisions regarding their reproductive health. The intervention included educational sessions and booklet distribution, ensuring that students received comprehensive and accessible information to support healthy behaviors.

This initiative aligns with the Sustainable Development Goals (SDGs), particularly goals 3, 4, and 17. SDG 3 emphasizes ensuring healthy lives and well-being for all ages, including reducing the burden of STIs and teenage pregnancies among adolescent (Wallengren et al., 2024). SDG 4 focuses on inclusive and quality education, encompassing essential reproductive health education (Putra et al., 2023). Finally, SDG 17 underscores the importance of partnerships for achieving sustainable development. By collaborating with government agencies, schools, and health organizations, this initiative strengthens efforts to promote adolescent reproductive health (George et al., 2021).

METHOD

This community service activity was conducted through an educational session using a lecture method, accompanied by the distribution of booklets (Figure 1) and leaflets to the respondents. The booklets and leaflets titled "Healthy Adolescents, Securing the Future" were distributed prior to the lecture, along with a brief explanation of their content. The activity was carried out at a state senior high school 7 Malang (SMAN 7 Malang) in June, attended by approximately 45 eleventh-grade students.



Figure 1. Booklet cover

This community service program was carried out in several stages. The preparatory phase involved the development of educational materials, including a booklet and pre- and post-tests. Additionally, the venue and timing of the activity were coordinated. The implementation phase commenced with the administration of a pre-test to the students, followed by the distribution of the booklet and a lecture-based presentation of the material. Upon completion of the lecture, a post-test was given to the students. As it was illustrated in Figure 2, this community service program was conducted in four stages.: (1) Preparation: This stage involved the development of educational materials, including a booklet, pre-test, and post-test. Additionally, logistical arrangements such as securing a venue and scheduling the activity were made. (2) Pre-test administration: Before the intervention, a pre-test was administered to assess participants' baseline knowledge. (3) Intervention: The intervention consisted of a lecture-based presentation of the material accompanied by the distribution of the booklet. (4) Post-test administration: Following the intervention, a post-test was administered to evaluate knowledge gain.

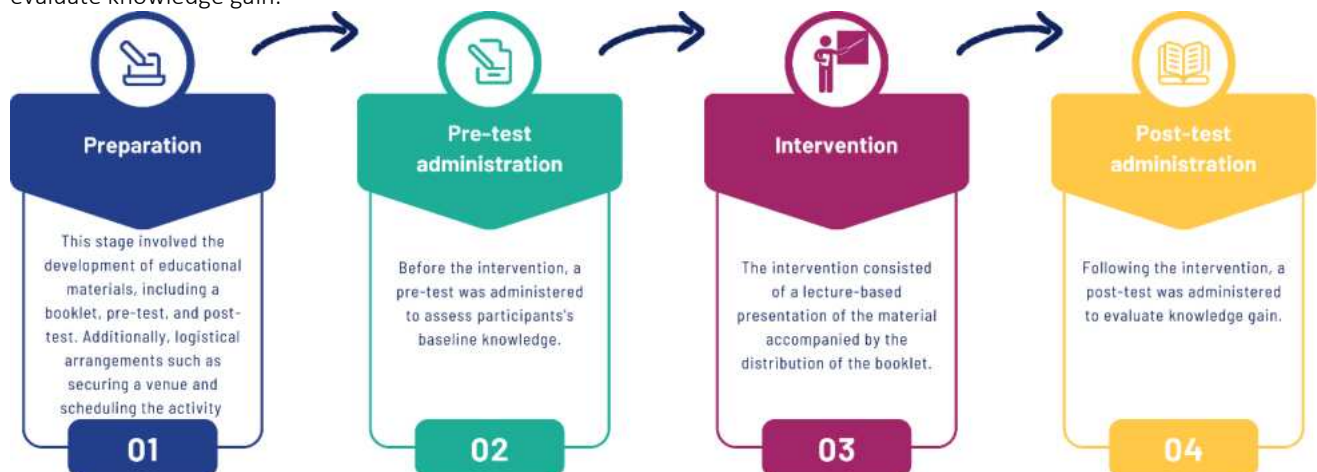


Figure 2. The stages in conducting community service program

The success of this community service program was evaluated based on several key criteria. Improvement in knowledge was assessed through a comparison of students' pre-test and post-test scores, with a significant increase indicating successful knowledge acquisition. Active participation was another important factor, measured by students' attentiveness during the lecture, their engagement in discussions, and their willingness to ask questions. Additionally, the utilization of educational materials played a crucial role, as students were encouraged to use the provided booklets and leaflets as reference materials even after the intervention. Lastly, positive feedback from both students and teachers was considered, focusing on the relevance, clarity, and usefulness of the educational content. These criteria ensured a comprehensive evaluation of the program's effectiveness in enhancing students' reproductive health knowledge and awareness.

The expected outcome of this community service activity is an increase in respondents' knowledge of adolescent reproductive health through the use of a booklet as a means of preventing reproductive diseases, sexually transmitted infections, and promoting responsible sexual behavior. Pre- and post-test questionnaires completed by the students will serve as an evaluation method to assess the success of this activity. The pre- and post-test results will be analyzed using SPSS 24 with a paired t-test.

RESULTS AND DISCUSSION

This activity was conducted as a one-day educational intervention in June 2024 at a senior high school in Malang City, Indonesia. The intervention aimed to increase adolescents' knowledge and awareness of reproductive health issues, with the goal of promoting healthier behaviors and improved well-being. The findings of this study will contribute to the development of more effective reproductive health education programs for adolescents.

The session began with the distribution of a pre-test questionnaire comprising 30 items, which participants completed prior to the educational session. Subsequently, a lecture-based presentation on adolescent reproductive health was delivered (Figure 3). Topics covered included the signs of puberty in both males and females, genital hygiene, and sexually transmitted infections such as HIV/AIDS. To reinforce the learning, participants were provided with a booklet containing supplementary information on reproductive health. At the end of the session, participants completed a post-test questionnaire.

A total of 45 participants attended the reproductive health counseling session, with their characteristics detailed in Table 1. The participants comprised 32 females (71%) and 13 males (29%). According to the World Health Organization (World Health Organization, 2024), adolescence spans from the age of 10 to 19 years. The participants in this session fell into three age groups, with the majority being 16 years old (54%) followed by 17 years old (33%). The remaining 6 participants (13%) were 18 years old.



Figure 3. Reproductive health counseling session at a senior high school in Malang City

Table 1. Respondents Characteristics

Variable	Number (n=45)	Percentage (%)
Gender		
Woman	32	71
Man	13	29
Age		
16 years	24	54
17 years	15	33
18 years	6	13

Reproductive health issues have significant long-term consequences for an individual's overall health and well-being (Lindberg et al., 2020). A study by Leone et al. (2024) found that unintended pregnancies and early childbearing have negative health impacts later in life. Indonesia continues to grapple with various reproductive health challenges, including child marriage, limited access to reproductive health services, and conflicting laws regarding abortion (Bearak et al., 2020; Nelson et al., 2022; Schonewille et al., 2022). Child marriage, as highlighted in studies by Suryani et al. (2024) and Rizkianti and Sari (2025), is associated with increased social vulnerability, decreased utilization of antenatal care, and adverse health outcomes for adolescent girls.

Health education plays a crucial role in shaping high school students' knowledge and behaviors related to reproductive health (Nadeak et al., 2023). This education aims to foster self-awareness regarding sexual decision-making and reproductive health. Furthermore, gaps in reproductive health education curricula for 14-18-year-olds indicate that many young people may lack essential knowledge about topics such as fertility, pregnancy, and infertility, thus necessitating comprehensive reproductive health education (Maslowski et al., 2023).

Several studies show that the implementation of comprehensive sex education, including information about anatomy of the reproductive organs, sexual function, and consequences of sexual intercourse, can increase student awareness (Siboro et al., 2024). In this community service program, comprehensive sex education was delivered through educational materials, namely booklets, which contained information about signs of puberty, anatomy of the reproductive organs, sexually transmitted infections (STIs), methods for preventing reproductive health problems and STIs, and signs and prevention of HIV/AIDS. By using educational materials, educational interventions can effectively reach the target audience, especially adolescents. These educational materials can provide accurate and important information for addressing reproductive health issues (Mujiyanti et al., 2024). This is necessary so that adolescents can improve their well-being and make informed choices about their reproductive and sexual health.

Table 2. Paired t-test results

	Amount	Mean±SD	P-value
Pre-Test	45	24.13±1.74	0,000*
Post-Test	45	28.64±0.77	

*p=0.000, $\alpha=0.05$

The use of audiovisual media such as booklets and videos can significantly improve knowledge about reproductive health among adolescents (Umami et al., 2022). In this community service program, respondents were given booklets and leaflets containing information about reproductive health among adolescents. Table 2 shows the average score of the respondents increased after the intervention, from 24.13±1.74 for pre-test to 28.64±0.77 for post-test. Based on the results of the paired T-test, a significant result was found (p-value = 0.000) indicating that there was a significant increase in knowledge about adolescent reproductive health before and after the intervention. This is consistent with research

conducted by Setyandari and Rahayuningsih (2023) which demonstrated that booklets and leaflets can be an effective educational tool to improve adolescents' knowledge about reproductive health. Other studies also show that booklets can strengthen healthy behaviors among school students (Citrawathi et al., 2022). One study comparing video media and booklets for education purposes found that both methods can significantly improve adolescents' knowledge about reproductive health education (Yuliwati & Solihatul Afiah, 2022). Overall, these findings highlight the positive results associated with the use of the booklet method to improve adolescents' understanding of healthy reproductive health.

Despite the positive outcomes of this community service program, several limitations should be acknowledged. The study was conducted at a single high school, SMAN 7 Malang, with a relatively small sample size of 45 students, which may limit the generalizability of the findings to a broader adolescent population. Additionally, the intervention was implemented in a single session, which may not be sufficient for long-term retention and behavioral change. The evaluation relied primarily on pre- and post-tests, without follow-up assessments to measure knowledge retention over time. Furthermore, external factors such as students' prior exposure to reproductive health information and variations in individual learning styles were not controlled, which could influence the results. Future programs should consider expanding the sample size, incorporating multiple sessions, and including longitudinal assessments to better evaluate the sustained impact of reproductive health education.

CONCLUSION

Knowledge of reproductive health among high school students has increased after receiving an educational intervention using a lecture and booklet method. This educational activity is expected to be one of the efforts to prevent reproductive health problems in adolescents such as reproductive organ diseases and sexually transmitted infections, thus improving individual well-being. For future activities, it is suggested to increase the number of respondents to better represent the population and to conduct long-term monitoring of the respondents.

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REFERENCES

- Afifah, M., Mareta, A., Kusumaning, A., & Sosroatmodjo, B. (2021). Problematika remaja sebagai generasi penerus bangsa. *Seminar Nasional Pengabdian Masyarakat*, 37–40. <https://jurnal.umj.ac.id/index.php/semnaskat/article/view/10775%0Ahttps://jurnal.umj.ac.id/index.php/semnaskat/article/download/10775/6073>
- Ahmad, F., & Karim, M. (2019). Impacts of knowledge sharing: a review and directions for future research. *Journal of Workplace Learning*, 31(3), 207–230. <https://doi.org/10.1108/JWL-07-2018-0096>
- Badan Pusat Statistik. (2023). *Jumlah penduduk pertengahan tahun (ribu jiwa), 2022-2023*. <https://www.bps.go.id/id/statistics-table/2/MTk3NSMy/jumlah-penduduk-pertengahan-tahun--ribu-jiwa-.html>
- Bearak, J., Popinchalk, A., Ganatra, B., Moller, A.-B., Tunçalp, Ö., Beavin, C., Kwok, L., & Alkema, L. (2020). Unintended pregnancy and abortion by income, region, and the legal status of abortion: estimates from a comprehensive model for 1990–2019. *The Lancet Global Health*, 8(9), e1152–e1161. [https://doi.org/10.1016/S2214-109X\(20\)30315-6](https://doi.org/10.1016/S2214-109X(20)30315-6)
- Bunga, A., Salsabila, R., Aula, R., & Maharani, S. (2021). Description of knowledge about reproductive health in youth at Muhammadiyah University Jakarta 2021. *Muhammadiyah International Public Health and Medicine Proceeding*, 1(1), 717–734. <https://doi.org/10.53947/miphmp.v1i1.121>
- Citrawathi, D. M., Adnyana, P. B., & Dewi, N. P. S. R. (2022). The effectiveness of adolescent health booklets to strengthen the character of healthy living behavior of junior high school students. *Journal of Education Research and Evaluation*, 6(3), 259–264. <https://doi.org/10.23887/jere.v6i3.53027>
- George, A., Jacobs, T., Ved, R., Jacobs, T., Rasanathan, K., & Zaidi, S. A. (2021). Adolescent health in the Sustainable Development Goal era: Are we aligned for multisectoral action? *BMJ Global Health*, 6(3), e004448. <https://doi.org/10.1136/bmjgh-2020-004448>
- Leone, T., Väisänen, H., & Witoelar, F. (2024). Women's fertility and allostatic load in the post-reproductive years: An analysis of the Indonesian Family Life Survey. *Population Studies*, 78(1), 127–149. <https://doi.org/10.1080/00324728.2022.2160004>
- Lindberg, L. D., Bell, D. L., & Kantor, L. M. (2020). The sexual and reproductive health of adolescents and young adults

- during the COVID-19 pandemic. *Perspectives on Sexual and Reproductive Health*, 52(2), 75–79. <https://doi.org/10.1363/psrh.12151>
- Maslowski, K., Reiss, M. J., Biswakarma, R., & Harper, J. (2023). Reproductive health education in the schools of the four UK nations: Is it falling through the gap? *Human Fertility*, 26(3), 527–539. <https://doi.org/10.1080/14647273.2023.2216395>
- Meilani, N., Hariadi, S. S., & Haryadi, F. T. (2023). The source of adolescents reproductive health information and dating behavior among senior high school students. *Disease Prevention and Public Health Journal*, 17(1), 55–62. <https://doi.org/10.12928/dpphj.v17i1.7165>
- Mujiyanti, S., Wulandari, A., & Rachmaniah, D. (2024). Perbedaan pendidikan kesehatan menggunakan metode audiovisual dan booklet terhadap peningkatan pengetahuan remaja tentang perilaku seks bebas. *Nursing Current: Jurnal Keperawatan*, 11(2), 154. <https://doi.org/10.19166/nc.v11i2.6965>
- Nadeak, B., Jejen, A., & Astuti, H. P. (2023). Measure effectiveness of reproductive health education programs teenagers in schools intermediate: Evaluation results in the Cileunyi Region Bandung Regency. *International Journal of Community Service (IJCS)*, 2(2), 197–210. <https://doi.org/10.55299/ijcs.v2i2.712>
- Namukisa, M., Kamacooko, O., Lunkuse, J. F., Ruzagira, E., Price, M. A., & Mayanja, Y. (2023). Incidence of unintended pregnancy and associated factors among adolescent girls and young women at risk of HIV infection in Kampala, Uganda. *Frontiers in Reproductive Health*, 5. <https://doi.org/10.3389/frph.2023.1089104>
- Nelson, H. D., Darney, B. G., Ahrens, K., Burgess, A., Jungbauer, R. M., Cantor, A., Atchison, C., Eden, K. B., Goueth, R., & Fu, R. (2022). Associations of unintended pregnancy with maternal and infant health outcomes. *JAMA*, 328(17), 1714. <https://doi.org/10.1001/jama.2022.19097>
- Nurmala, I., Rahman, F., Nugroho, A., Erlyani, N., Laily, N., & Anhar, V. Y. (2018). *Promosi kesehatan*. Airlangga University Press. <https://books.google.co.id/books?id=SGvIDwAAQBAJ&printsec=frontcover&hl=id&v=onepage&q&f=false>
- Nursanti, D. P., Kumalasari, E. P., Setyaningsih, A., Siekmans, J., & Wabeke, V. (2022). Analysis of adolescent reproductive health knowledge on premarital sexual attitude. *Journal for Quality in Women's Health*, 5(2), 189–194. <https://doi.org/10.30994/jqwh.v5i2.160>
- Purnamawati, D., Musthofa, S. B., & Agushyana, F. (2024). Cultural impact on adolescent behavior advancing health, gender: A scoping review. *Jurnal Promkes: The Indonesian Journal of Health Promotion and Health Education*, 12(SI 1), 174–180. <https://doi.org/10.20473/jpk.V12.ISI1.2024.174-180>
- Putra, D. S., Syifak, R. R., Huda, F. S., Guntoro, Y. T., & Fahira, A. (2023). Pengembangan karakter bangsa pada anak melalui budaya mendongeng guna mewujudkan Sustainable Development Goals Nomor 4. *Jurnal Dharma Bhakti Ekuitas*, 7(2), 131–139. <https://doi.org/10.52250/p3m.v7i2.626>
- Putri, M. E., Ariadi, A., & Lestari, Y. (2023). Factors influencing risky actions on early adolescent reproductive health at junior high school 30 Kerinci. *Contagion: Scientific Periodical Journal of Public Health and Coastal Health*, 5(2), 478. <https://doi.org/10.30829/contagion.v5i2.15408>
- Rahmadania, D., Retnowati, E., Sasmita, K., & Fitriyani, H. (2024). Evaluating reproductive and sexual health training for Red cross youth: The Kirkpatrick model. *Journal of Nonformal Education*, 10(1), 179–194.
- Rizkianti, A., & Sari, D. P. (2025). Child marriage and its impact on reproductive health and rights of girls in Indonesia. *Vulnerable Children and Youth Studies*, 20(1), 35–44. <https://doi.org/10.1080/17450128.2024.2361921>
- Schonewille, N. N., Rijkers, N., Berenschot, A., Lijmer, J. G., van den Heuvel, O. A., & Broekman, B. F. P. (2022). Psychiatric vulnerability and the risk for unintended pregnancies, a systematic review and meta-analysis. *BMC Pregnancy and Childbirth*, 22(1), 153. <https://doi.org/10.1186/s12884-022-04452-1>
- Setyandari, F., & Rahayuningsih, F. B. (2023). The effectiveness of reproductive health education to increase knowledge among adolescents. *Malahayati International Journal of Nursing and Health Science*, 6(6), 458–463. <https://doi.org/10.33024/minh.v6i6.13062>
- Siboro, A., Zuska, F., Ginting, B., Ismail, R., & Sitorus, H. (2024). Patterns of reproductive health and sexuality learning among private high school students at Yayasan Perguruan Mayjend Sutoyo in Medan. *Perspektif*, 13(1), 221–230. <https://doi.org/10.31289/perspektif.v13i1.10980>
- Simatupang, L. L. (2018). Tingkat pengetahuan remaja putri tentang kesehatan reproduksi di SMA Negeri Bahorok tahun 2017. *Excelent Midwifery Journal*, 1(2), 73–78. <https://doi.org/10.55541/emj.v1i2.58>
- Suryani, S., Listianti, D. E., & Fajri, W. A. (2024). The challenges in maturing the age of marriage among teenagers in bandar

village, pacitan regency: Reproductive health review. *Indonesian Journal of Medical Anthropology*, 5(1), 1–6. <https://doi.org/10.32734/ijma.v5i1.14401>

Umami, W. R., Faizah, Z., & Dwi Jayanti, R. (2022). The effect of audio visual media on improving knowledge reproductive and sexual health rights. *Indonesian Midwifery and Health Sciences Journal*, 6(3), 257–265. <https://doi.org/10.20473/imhsj.v6i3.2022.257-265>

Utaminingtyas, F., Mufidaturrosida, A., Maria, A., Agustina, C. E., Wahyuni, I., Wahyuni, I., & Sasanti, S. D. (2024). Penyuluhan kesehatan tentang mengenal ciri-ciri pubertas pada remaja melalui media e-booklet. *Jurnal Pengabdian Masyarakat Aupa (JPMA)*, 6(1), 24–30. <https://doi.org/10.51933/jpma.v6i1.1290>

Vaina, A., & Perdikaris, P. (2022). School-based sex education among adolescents worldwide: Interventions for the prevention of STIs and unintended pregnancies. *British Journal of Child Health*, 3(5), 229–242. <https://doi.org/10.12968/chhe.2022.3.5.229>

Wallengren, E., Guthold, R., Newby, H., Moller, A.-B., Marsh, A. D., Fagan, L., Azzopardi, P., Ba, M. G., & Kågesten, A. E. (2024). Relevance of the Sustainable Development Goals (SDGs) to adolescent health measurement: A systematic mapping of the SDG framework and global adolescent health Indicators. *Journal of Adolescent Health*, 74(6), S47–S55. <https://doi.org/10.1016/j.jadohealth.2024.01.004>

Wang, H., Zou, Y., Liu, H., & Chen, X. (2023). Analysis of unintended pregnancy and influencing factors among married women in China. *China Population and Development Studies*, 7(1), 15–36. <https://doi.org/10.1007/s42379-023-00126-3>

World Health Organization. (2024). *Adolescent health*. https://www.who.int/health-topics/adolescent-health#tab=tab_1.

Yuliwati, N., & Solihatul Afiah, E. (2022). Monitoring intervention of video media extension and booklet to improving adolescent reproductive health knowledge. *International Journal of Health and Pharmaceutical (IJHP)*, 2(4), 708–713. <https://doi.org/10.51601/ijhp.v2i4.99>



Empowering communities through the sustainable transformation of used cooking oil waste into aromatherapy candles: A holistic approach to waste management

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ABSTRACT

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Used cooking oil from household frying is often discarded improperly, leading to environmental pollution. One sustainable solution is repurposing it into aromatherapy candles, reducing waste while creating economic opportunities. To address this issue, KKM 210 UIN Malang conducted a community service initiative titled "Optimizing the Transformation of Used Cooking Oil Waste into Aromatherapy Candles: A Sustainable Waste Management Approach" in Petungsewu Village, in collaboration with PKK members. This program aimed to raise awareness of the dangers of reusing used cooking oil, reduce improper disposal, and introduce innovative business ideas. The socialization included brochure distribution, material presentations, hands-on training, interactive Q&A sessions, and entrepreneurship guidance. A pre- and post-assessment was conducted to measure knowledge retention and skill acquisition. Results showed a significant increase in participant understanding, with knowledge of candle-making rising by 65% and 85% of participants gaining confidence in independent production. Additionally, 75% of participants expressed interest in developing a home-based business, demonstrating the initiative's potential for local economic development. These findings highlight the importance of transforming used cooking oil into value-added products as both an eco-friendly waste management solution and a means of empowering local communities. The initiative serves as a model for sustainable development, showcasing how practical innovations can address both environmental and economic challenges. Future programs should focus on expanding training, facilitating market access, and supporting small business growth to ensure long-term impact and scalability.

Kata Kunci

Minyak goreng bekas

Lilin aromaterapi

Pengelolaan limbah

Mendaur ulang minyak goreng

Memberdayakan komunitas melalui transformasi berkelanjutan limbah minyak goreng bekas menjadi lilin aromaterapi: Sebuah pendekatan holistik terhadap pengelolaan limbah. Minyak goreng bekas dari penggorengan rumah tangga sering kali dibuang dengan cara yang tidak benar, sehingga menyebabkan pencemaran lingkungan. Salah satu solusi yang berkelanjutan adalah dengan memanfaatkannya kembali menjadi lilin aromaterapi, sehingga dapat mengurangi limbah sekaligus menciptakan peluang ekonomi. Untuk mengatasi masalah ini, KKM 210 UIN Malang melakukan inisiatif pengabdian masyarakat yang berjudul "Optimalisasi Transformasi Limbah Minyak Jelantah Menjadi Lilin Aromaterapi: Pendekatan Pengelolaan Sampah Berkelanjutan" di Desa Petungsewu, bekerja sama dengan anggota PKK. Program ini bertujuan untuk meningkatkan kesadaran akan bahaya penggunaan kembali minyak jelantah, mengurangi pembuangan yang tidak tepat, dan memperkenalkan ide bisnis yang inovatif. Sosialisasi ini mencakup pembagian brosur, presentasi materi, pelatihan langsung, sesi tanya jawab interaktif, dan bimbingan kewirausahaan. Penilaian sebelum dan sesudah pelatihan dilakukan untuk mengukur retensi pengetahuan dan perolehan keterampilan. Hasilnya menunjukkan peningkatan yang signifikan dalam pemahaman peserta, dengan pengetahuan tentang pembuatan lilin meningkat sebesar 65% dan 85% peserta mendapatkan kepercayaan diri dalam produksi mandiri. Selain itu, 75% peserta menyatakan ketertarikannya untuk mengembangkan usaha rumahan, yang menunjukkan potensi inisiatif ini untuk pengembangan ekonomi lokal.

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INTRODUCTION

Waste management is a pressing global issue that demands innovative and sustainable solutions. The improper disposal of household waste, including used cooking oil, poses serious environmental and health risks (Hanjarvelianti & Kurniasih, 2020). Many countries struggle with waste accumulation, which contributes to pollution, habitat destruction, and adverse public health effects (Hariono et al., 2022; Mulia, 2018). Used cooking oil is one of the most commonly discarded household waste products, yet its improper disposal—such as being poured into drainage systems—can lead to severe environmental consequences, including water contamination and ecosystem imbalance (Khuzaimah, 2020; Setyaningsih et al., 2018). Addressing this issue requires practical waste management strategies that not only mitigate environmental harm but also create economic opportunities for communities (Beghetto, 2025).

Used cooking oil is the leftover frying oil that is usually produced from household cooking activities. This waste comes from various types of cooking oils, such as corn oil, vegetable oil, samin oil, and so on. Food processing with cooking oil produces used cooking oil. During the frying process, three degradation reactions occur: hydrolysis, which produces free fatty acids, oxidation, and polymerization (Fatimah et al., 2023; Kenarni, 2023). Cooking oil that is used more than three times will be harmful to the body. This is due to the deterioration of oil, which will affect the quality and nutritional value of fried food and can have an impact on health (Bachtiar et al., 2022; Inayati & Dhanti, 2021). Used cooking oil consumed can increase the potential for cancer and narrowing of blood vessels, triggering hypertension, stroke, and coronary heart disease (Aini et al., 2020; Rahayu, 2021).

The disposal of used cooking oil in waterways remains an environmental problem that requires attention. The nature of used cooking oil that cannot mix with water causes accumulation and results in the covering of the water surface by a layer of oil (Mahmudah & Shofiah, 2023; Maulida & Makmuroh, 2023). The covering of the water surface by the oil layer will block sunlight from entering the water, followed by an increase in chemical oxygen demand (COD) and biological oxygen demand (BOD) levels. This causes the existing biota to die and disrupt the balance of the ecosystem (Hakim et al., 2021; Kenarni, 2023; Nirwana & Ernawati, 2023). This condition is very concerning because waste oil can cause water and soil pollution in the environment. Processing used cooking oil waste into a useful material is one alternative to reduce the level of environmental pollution.

Aromatherapy candles are enhanced by the addition of essential oils, which provide a relaxing or calming scent (Permadi et al., 2022; Wardani et al., 2021). The primary function of these candles is to act as a stress reliever for those who smell them. Stress is the body's response to pressures from life situations or events (Bachtiar et al., 2022; Foundation, 2018). The aromas from essential oils carry molecules into the nasal nerves and brain, stimulating odor receptors and interacting with the body's nervous and limbic systems (Ayu et al., 2020; Ridlwan et al., 2023). Additionally, aromatherapy candles have economic value and can contribute to community income if properly developed.

To address the dual challenge of environmental pollution and community empowerment, this study focuses on a community engagement initiative aimed at educating and training the women of PKK RT 09 Petungsewu Hamlet in producing aromatherapy candles from used cooking oil. This initiative serves multiple objectives: (1) reducing household reliance on reused cooking oil, (2) preventing improper disposal of oil waste, and (3) fostering creativity and innovation in developing sustainable business ventures. Through hands-on training and skill development, this program aspires to equip community members with practical knowledge, thereby promoting environmental consciousness while enhancing economic resilience. This program supports the Sustainable Development Goals program number 7 and 8, i.e affordable and clean energy and industry, innovation and infrastructure (<https://sdgs.un.org/goals>).

This study employs a participatory approach, combining educational workshops, hands-on training, and business development guidance. By integrating sustainable waste management with community empowerment, this initiative demonstrates how household waste can be repurposed into valuable products, creating both environmental and economic benefits.

METHOD

The "Socialization of Used Cooking Oil Processing into Aromatherapy Candles" activity was conducted in Petungsewu Timur Hamlet, Petungsewu Village, Wagir District, Malang City, East Java, on January 20, 2024. This offline event was attended by approximately 30 members of the PKK RT 09 Petungsewu Hamlet, aiming to educate and empower the community in sustainable waste management through the production of aromatherapy candles from used cooking oil.

Program Design and Implementation

The program was carefully planned following a preliminary survey and discussions with Bu RT (the local neighborhood head), the head of the PKK in Petungsewu Village, and Bu Ina (the host of the PKK activity). Since the socialization was integrated into a routine PKK meeting, this ensured maximum community participation and engagement.

The training employed a multimodal approach consisting of the following methods:

1. Brochure Distribution – Participants received brochures at the beginning of the session, serving as a structured guide that summarized key concepts, step-by-step procedures, and benefits of transforming used cooking oil into candles.

This method was chosen for its accessibility and ease of reference, allowing participants to review the information after the session.

2. Material Presentation – A structured presentation explained the functions and uses of all tools and materials required for candle-making. This method ensured that participants understood the rationale behind each component before engaging in hands-on activities.
3. Processing Demonstration – A step-by-step demonstration showcased the entire candle-making process, from oil filtration to adding essential oils and molding the final product. Live demonstrations were chosen because they provide visual learning, making it easier for participants to replicate the process.
4. Hands-on Practice – Participants actively engaged in making their own aromatherapy candles under supervision. This hands-on approach helped reinforce learning through direct experience.
5. Interactive Q&A Session – Attendees were encouraged to ask questions, which were directly addressed by KKM 210 UIN Malang facilitators. The Q&A format promoted deeper understanding and resolved any uncertainties.

Entrepreneurship Education – The session concluded with guidance on selling aromatherapy candles, covering basic marketing strategies, pricing considerations, and potential business opportunities. This component was included to equip participants with the knowledge to turn their new skills into an economic opportunity.

Criteria for Measuring Success

To evaluate the effectiveness of the intervention, several success criteria were established:

1. Knowledge Retention – Participants' understanding of the environmental impact of used cooking oil and the process of making aromatherapy candles was assessed through informal questioning before and after the session.
2. Skill Acquisition – Success was measured by the ability of participants to independently complete each step of the candle-making process, as observed during the hands-on practice.
3. Participant Engagement – The level of interaction during the Q&A session and willingness to practice the techniques demonstrated was recorded as an indicator of interest and learning effectiveness.
4. Entrepreneurial Interest – A follow-up discussion was held to determine how many participants were interested in continuing candle-making as a potential business venture.

By integrating interactive learning, practical demonstrations, and economic empowerment, this socialization program aimed to enhance community awareness, encourage skill development, and provide a sustainable approach to waste management.

RESULT AND DISCUSSION

Implementation of demonstration

The work program carried out by KKM 210 UIN Malang in Petungsewu RT 09 Hamlet is to socialize the processing of used cooking oil waste into aromatherapy candles and provide directions for selling these products. The implementation of activities uses the method of providing brochures, material presentations, processing practices, and questions and answers. This empowerment is aimed at mothers with the aim of socializing and increasing knowledge about processing used cooking oil waste and providing business ideas for establishing MSMEs. The socialization was carried out in person and attended by 30 people who were the women of PKK RT 09 Petungsewu Hamlet, Petungsewu Village, Wagir Sub-district. PKK cadres are selected community members who have understood and implemented the 10 main PKK programs who are willing and able to provide counseling and mobilize the community to carry out the necessary activities. The ability of PKK cadres who already have additional knowledge and skills is more expected to be able to realize the skills that will be given and develop for economic improvement in Petungsewu Village, Wagir Subdistrict. (Arfan dan Sumiati, 2018).

This socialization was conducted at the PKK routine gathering on Saturday night, more precisely on 20 January 2024 at 18:30. The event began with an opening, then singing the PKK march, reading the 10 main PKK programs, remarks, then socialization. KKM 210 UIN Malang started the socialization by distributing brochures. A brochure is one of the informative media consisting of one or several pages used by many people for promotion and introduction, be it products or services (Lengkey et al., 2014: Islam, 2024). Brochures were distributed containing tools, materials, and steps for making aromatherapy candles from used cooking oil to PKK women before the material presentation. The brochure fully explained the functions and uses of the tools and materials. Participants then skimmed the brochures that had been distributed.



Picture1. Brochure on Processing Used Cooking Oil into Aromatherapy Candles

The material presentation was delivered by KKM 210 UIN Malang by showing the materials and tools along with their functions and uses. The next socialization was the practice of making aromatherapy candles from used cooking oil by KKM 210 UIN Malang, which was listened to very enthusiastically by the PKK women. The process of making aromatherapy candles from used cooking oil consists of several tools and materials. The materials used are as follows: 1) used cooking oil (1/2 liter); 2) stearin (200 grams); 3) charcoal (50 grams); 4) crayon dye; 5) essential oil; and 6) candle wick. The tools used are as follows: 1) stove, 2) measuring cup, 3) pot, 4) stirrer, 5) container for candles, 6) plastic bag (crackle), 7) sieve, 8) rubber, and 9) scissors.



Picture 2. Aromatherapy Candle Making Activity from Used Cooking Oil

The steps for making aromatherapy candles from used cooking oil begin with soaking the used cooking oil using activated charcoal to remove the unpleasant aroma for 24 hours (Anugrah et al., 2023). Activated charcoal is a material in the form of amorphous carbon which has a very large surface area of 300 - 2000 m² /gram so that it has pores that have the ability to absorb. Used cooking oil is then filtered and stearin is added. Stearin is a mixture of various fatty acids and unsaturated fatty acids with the largest components being palmitic acid and oleic acid. Stearin serves to harden and form a solid wax solution after it cools (Amrin et al., 2024; Jamilatun et al., 2022). The two ingredients were put in a pot with a ratio of 125 ml of used cooking oil to 75 grams of stearin. In addition, crayon colouring was also added to add aesthetics and essential oil fragrance as aromatherapy (Nirwana & Ernawati, 2023). Furthermore, all ingredients were cooked on the stove over low heat and kept stirring until smooth. Then it is immediately transferred to a glass cup and a candle wick is added. Finally, the aromatherapy candle is allowed to harden. After it has hardened a little, additional decorations are given from dried flowers. The appearance of the candle ready for use is shown in Figure 3.

Aromatherapy candles made from used cooking oil have an orange color and a citrus fragrance. Aromatherapy candles from used cooking oil have an appearance that is not much different from aromatherapy candles in general, as shown in Figure 3. This is because the used cooking oil has no odor because it has been soaked with charcoal for 24 hours. Processing used cooking oil waste into aromatherapy candles in addition to protecting the environment from pollution can also be of economic value to the community when sold both offline and online (Kumar et al., 2025; Murti et al., 2025). This craft is a very promising prospect for the international market because candles are not only useful as a means of lighting. However, candles also function as stress-reducing or stress-relieving drugs (Vinet & Zhedanov, 2011). This anti-stress property is contained in aromatherapy candles that are favored by foreign tourists (Ginting et al., 2020).



Picture 3. Aromatherapy Candle from Used Cooking Oil Waste

The next socialization was a question-and-answer session. The PKK women were very enthusiastic about asking questions, and KKM 210 UIN Malang immediately answered these questions very clearly and easily. The last socialization was about business opportunities from processing used cooking oil waste into aromatherapy candles. The women were given education on how to set up an MSME business by utilizing digital marketing in order to become a source of income for the community. The community was also given examples of how to package products to be attractive. The results of the socialization activities for PKK women can be seen from the positive responses given throughout the socialization process, where the women were very enthusiastic and active in asking questions about the ingredients and the process of making aromatherapy candles. At the end of the session, KKM 210 UIN Malang gave the aromatherapy candles that had been made before with attractive packaging to the PKK women, who would then be given to the Head of the Village and the Chairperson of the PKK. In addition, KKM 210 UIN Malang also provided the remaining materials for making aromatherapy candles to the women so that they can practice independently at home.

Assessment of Participant Knowledge and Skill Improvement

To measure the impact of this socialization program, a pre- and post-assessment was conducted using structured questionnaires to evaluate participant knowledge and skill acquisition. The assessment results are summarized in Table 1 below:

Table 1. Pre- and Post-Assessment of Participant Knowledge and Skills

Assessment Criteria	Pre-Test (% of Participants with Knowledge)	Post-Test (% of Participants with Knowledge)	Knowledge Increase (%)
Understanding the environmental impact of used cooking oil waste	40%	95%	+55%
Knowledge of materials and tools for making aromatherapy candles	30%	92%	+62%
Ability to explain the step-by-step process of candle-making	25%	90%	+65%
Confidence in making aromatherapy candles independently	20%	85%	+65%
Interest in starting a home-based aromatherapy candle business	15%	75%	+60%

These findings demonstrate a significant improvement in knowledge retention and practical skills among participants. The largest increase was observed in understanding the step-by-step candle-making process (+65%) and confidence in producing candles independently (+65%), indicating the effectiveness of hands-on learning and direct demonstrations. Additionally, 75% of participants expressed interest in commercializing their candle-making skills, suggesting strong entrepreneurial potential. This highlights the broader economic impact of the initiative and its potential role in strengthening household income and local MSME development. This suggests that the initiative not only improved technical competencies but also fostered economic empowerment at the household level, contributing to the growth of local MSMEs (Micro, Small, and Medium Enterprises). From an environmental perspective, the notable increase in understanding the environmental impact of used cooking oil waste (from 40% to 95%) is particularly important. According to Endang Yani et al., (2025) ; Wal Ikram et al., (2025) improper disposal of used cooking oil can

contaminate groundwater and severely affect aquatic ecosystems. Thus, by raising participants' environmental awareness, the program contributes to broader sustainability goals and promotes responsible waste management practices.

Women's Interest in Socialization

The socialization of making aromatherapy candles from used cooking oil went smoothly and received a very good response from the women of PKK RT 09 Petungsewu Hamlet. The response of the women was assessed from the number of women who met 100% of the target participants and also from the many questions asked by the women in the question-answer session on making aromatherapy candles, which extended the duration of the activity beyond the proper duration. The women also said they wanted to immediately practice making aromatherapy candles from used cooking oil themselves and asked about the location of purchase and the price of the ingredients. This is an indicator of the success of the socialization activity where it is expected that the PKK women, who are mostly young, have an interest in entrepreneurship. The obstacle experienced in the demonstration of making aromatherapy candles from used cooking oil was that there were some women who did not see the practice of making aromatherapy candles directly because they were blocked by a wall and could not stand to get closer. However, the students provided brochures and showed the aromatherapy candles in turn. Documentation of PKK women who participated in the socialization of processing used cooking oil into aromatherapy candles can be seen in Figure 4.

Aromatherapy candles made from waste cooking oil use affordable and readily available materials. In addition, it is easy to make, so it can be followed by housewives or teenage children. This activity can be an entrepreneurial opportunity to support the family economy. Making aromatherapy candles from used cooking oil from an economic point of view does not require large costs but the production of high economic value (Hilabi et al., 2024; Inayati & Dhanti, 2021; Putra et al., 2023). Now the products can be sold online, which has a wide target market. It is hoped that this utilization will not only reduce environmental problems but also create an environmentally friendly creative economy for the community (Arifin et al., 2024; Damayanti et al., 2020).



Picture 4. Documentation of PKK women who participated in the socialization of making aromatherapy candles from used cooking oil

Profit Projection of Aromatherapy Candle from Used Cooking Oil

Making aromatherapy candles from used cooking oil is one of the creative business ideas that can generate economic value and can reduce used cooking oil waste. The projected profit of selling aromatherapy candles from used cooking oil is determined by considering the variable fixed costs and variable costs as well as the production capacity of used cooking oil aromatherapy candles. Determination of production costs is carried out with a full costing approach that takes into account all elements of production costs into production costs. This method makes it easier for entrepreneurs in the calculation process because the determination of the selling value depends on the determination of the margin value, which is determined directly from the amount of the cost of goods according to the entrepreneur (Wardani et al., 2021)). The calculation of the cost of goods manufactured is explained as follows:

$$\begin{aligned}\text{Fixed cost} &= \text{depreciation cost} \\ &= \text{Rp0,00} \\ \text{Variable costs} &= \text{consumables} + \text{travel and transport costs} \\ &= \text{Rp197.200,00} + \text{Rp20.000,00} \\ &= \text{Rp217.200,00} \\ \text{Cost of production} &= \frac{217.200}{8} = \text{Rp27.150,00}\end{aligned}$$

Notes: Labor costs have not been included as a cost component because the scale of production is still small, so it can still be carried out by families or family members. In addition, the production time is very short so that production can be done on the sidelines of daily activities.

Based on the production price, a projection of the profit from selling the used cooking oil aromatherapy candles can be made. Determination of profit is done by comparing the selling price with the cost of production. The selling price of one package of aromatherapy candles (assuming a net weight of 100 g) was determined by a method based on market price references so that the profit calculation was carried out as follows (Table 1). Based on the projected profit obtained, the relative profit ratio (R/C ratio) can be determined. This ratio is used to project the relative profit obtained in a business. The business will be said to be feasible to run if the R/C value obtained is greater than 1. The calculation of the ratio is as follows:

$$R/C = 280,000 / 217,200 = 1.28$$

The R/C value obtained shows results greater than 1. Based on these results, it shows that the used cooking oil aromatherapy candle business is a feasible business idea to develop because it produces profitable economic value (Kune, 2017 in Bachtiar et al., 2022). Therefore, the aromatherapy candle business from used cooking oil can be developed into a small business for the women of PKK RT 09 in Petungsewu Village because this business generates economic benefits, as explained in Table 1.

Tabel 1. Perhitungan Analisa Keuangan

Uraian	Harga
<i>Selling price of a product</i>	Rp35.000,00
<i>Production cost of a product</i>	Rp27.150,00
<i>Net profit (price-cost of production)</i>	Rp7.850,00/wrap
<i>Total revenue (price x production quantity)</i>	Rp35.000,00 x 8=Rp280.000,00/production
<i>Total production cost (fixed cost + variable cost)</i>	Rp217.200,00/ production
<i>Profit (total revenue - total cost of production)</i>	Rp62.800,00/ production

Broader Implications for Local Economic Development

The strong entrepreneurial interest among participants suggests significant potential for community-based economic development. If even a fraction of participants commercialize their candle-making skills, the initiative could:

1. Enhance household income, contributing to financial stability for women and families.
2. Foster local MSME (Micro, Small, and Medium Enterprises) growth, strengthening the regional economy.
3. Promote sustainable practices, reducing environmental pollution from used cooking oil disposal.
4. Encourage women's empowerment, positioning them as key contributors to economic development.

The initiative aligns with global sustainability efforts, demonstrating how waste management strategies can drive both economic and environmental progress. Future efforts should focus on expanding the program, providing access to funding, marketing strategies, and business incubation support to scale up production.

CONCLUSION

The processing of aromatherapy candles using used cooking oil was carried out by direct socialization to the women of PKK RT 09 Petungsewu Hamlet. Through this socialization, it is expected that the women can reduce the use of used cooking oil for frying food, reduce the disposal of used cooking oil to the environment, and utilize used cooking oil to make aromatherapy candles, create creative business ideas, and increase economic value. The profit earned from the production of aromatherapy candles reached IDR 7,850 per unit, with a relative profit ratio of 1.28. The relative profit ratio exceeding 1 indicates that this business is worth developing because it can generate profitable economic value. Furthermore, this business's strategy may lessen the effects of wasteful use of cooking oil in the neighborhood.

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REFERENCE

- Aini, D. N., Arisanti, D. W., Fitri, H. M., & Safitri, L. R. (2020). Pemanfaatan minyak jelantah untuk bahan baku produk lilin ramah lingkungan dan menambah penghasilan rumah tangga di Kota Batu. *Warta Pengabdian*, 14(4), 253. <https://doi.org/10.19184/wrtp.v14i4.18539>
- Amrin, S., Parera, H. R., Ota, M. K., Nande, M., Hubertus, S., Ma, G., Saprianus, Y., Ngapa, D., Banda, Y. M., Tola, D., Maria, A., Djou, G., & Nino, O. (2024). *assistance in manufacturing soap from citrai as an economic solution for the use of household ingredients in Watumanu Bajawa Village*. 5(2), 77–84.
- Anugrah, D. S. B., Wijanarko, A. M., & Sinanu, J. D. (2023). Pemberdayaan pedagang kantin di Universitas Katolik Indonesia Atma Jaya, Kampus BSD, Melalui Edukasi pengolahan minyak jelantah menjadi lilin aromaterapi. *I-Com: Indonesian Community Journal*, 3(3), 1279–1285. <https://doi.org/10.33379/icom.v3i3.3116>

- Arifin, R., Widarko, A., Bastomi, M., Pangestuti, A. P., Puspitasari, D., & Alfandi, M. N. (2024). Strengthening the creative economy of the community through the utilization of used cooking oil waste into aromatherapy candles. *AKM: Aksi Kepada Masyarakat*, 5(1), 215–224. <https://doi.org/10.36908/AKM.V5i1.1156>
- Ayu, G., Jyoti, P., Utami, P., Tjandrawibawa, P., & Ciputra, U. (2020). Peran Aroma terapi melalui media lilin sebagai sarana untuk mengurangi stres pada generasi milenial. In *Seminar Nasional Envisi 2020 : Industri Kreatif* (pp. 188–195).
- Bachtiar, M., Irbah, I., Islamiah, D. F., Hafidz, F. R., Hairunnisa, M., Viratama, M. A., & Chelsabiela, S. (2022). Pemanfaatan minyak jelantah untuk pembuatan lilin aromaterapi sebagai ide bisnis di Kelurahan Kedung Badak. *Jurnal Pusat Inovasi Masyarakat (PIM)*, 4(2), 82–89. <https://doi.org/10.29244/jpim.4.2.82-89>
- Beghetto, V. (2025). Waste cooking oils into high-value products: Where Is the industry going? *Polymers* 2025, Vol. 17, Page 887, 17(7), 887. <https://doi.org/10.3390/POLYM17070887>
- Damayanti, F., Supriyatin, T., & Supriyatin, T. (2020). Pemanfaatan limbah minyak jelantah sebagai upaya peningkatan kepedulian masyarakat terhadap lingkungan. *Dinamisia : Jurnal Pengabdian Kepada Masyarakat*, 5(1). <https://doi.org/10.31849/dinamisia.v5i1.4434>
- Endang Yani, T., Wibisono, T., Roestanto, A., Semarang, U., Studi Manajemen, P., & Ekonomi, F. (2025). Pemanfaatan limbah minyak jelantah menjadi produk yang bernilai ekonomis di Kota Semarang. *Jurnal Abdimas Bina Bangsa*, 6(1), 665–672. <https://doi.org/10.46306/JABB.V6i1.1721>
- Fatimah, D. D. S., Wijaya, M. R., Raniyanti, U., Rabbani, M. R., Yudistira, R., Fhayed, N. H. Al, Dwiyantri, K. N., Nazrulloh, I., Aditia, A., Zulkarnaen, E., Firmansyah, M. R., Anggana, M., Madani, A. I., Abdusyukur, M., Nuraisah, N., Melinda, S., Sriyauwahyuni, P., Parlina, R., Zaky, A. S., ... Malik, J. (2023). Sosialisasi pemanfaatan minyak jelantah pada masyarakat Desa Mulyasari Bayongbong. *Jurnal PKM MIFTEK*, 4(2), 100–106. <https://doi.org/10.33364/miftek/v.4-2.1467>
- Foundation, M. H. (2018). Stress: Are we coping? In *Book*. Mental Health Foundation.
- Ginting, D., Shabri Putra Wirman, Yulia Fitri, Neneng Fitrya, Sri Fitria Retnawaty, & Noni Febriani. (2020). PKM pembuatan sabun batang dari limbah minyak jelantah bagi IRT Kelurahan Muara Fajar Kota Pekanbaru. *Jurnal Pengabdian UntukMu NegeRI*, 4(1), 74–77. <https://doi.org/10.37859/jpumri.v4i1.1857>
- Hakim, R., Wrasati, L. P., & Arnata, I. W. (2021). Karakteristik minyak jelantah hasil dari proses pemurnian dengan ampas tebu pada berbagai variasi suhu dan waktu pengadukan. *Jurnal Rekayasa Dan Manajemen Agroindustri*, 9(4), 427. <https://doi.org/10.24843/jrma.2021.v09.i04.p01>
- Hanjarvelianti, S., & Kurniasih, D. (2020). Pemanfaatan minyak jelantah dan sosialisasi pembuatan sabun dari minyak jelantah pada masyarakat Desa Sungai Limau Kecamatan Sungai Kunyit-Mempawah. *Jurnal Buletin Al-Ribaath*, 15(2), 26. <https://doi.org/10.29406/br.v17i1.1878>
- Hariono, T., Munawaroh, M., Yaqin, N., Hidayah, N., Aisa, A., & Sulaikho, S. (2022). Mengurangi limbah minyak tanah melalui pembuatan sabun cuci dari jelantah. *Jumat Ekonomi: Jurnal Pengabdian Masyarakat*, 3(2), 93–97. https://doi.org/10.32764/abdimas_ekon.v3i2.2472
- Hilabi, A. R., Sholihuddin Zen, A., Kurniasari, A., Husna, S., Dwi Hariyani, S., Nova Rizke Putri, A., Chaerani, A., Lutfiyah, F., Hudaifah, I., Kunci, K., Kupang, K., Aromaterapi, L., & Jelantah, M. (2024). Improving human resources and environmental preservation through training in making aromatherapy candles from used cooking oil in Kupang Sub-District. *Partisipan*, 1(1), 16–22. <https://journal.innoscientia.org/index.php/partisipan/article/view/108>
- Inayati, N. I., & Dhanti, K. R. (2021). Pemanfaatan Minyak jelantah sebagai bahan dasar pembuatan lilin aromaterapi sebagai alternatif tambahan penghasilan pada anggota Aisyiyah Desa Kebanggan Kec Sumbang. *Budimas : Jurnal Pengabdian Masyarakat*, 3(1), 160–166. <https://doi.org/10.29040/budimas.v3i1.2217>
- Islam, R. (2024). *Digital brochure for social media marketing : creating a digital brochure for Mixmart*. <http://www.theseus.fi/handle/10024/868333>
- Jamilatun, S., Luthfiani, I. N., Putri, D. P., Pitoyo, J., & Rahayu, A. (2022). The effect of variations of stearin mass and used cooking oil from purification with activated carbon on the quality of the candle. *Agroindustrial Technology Journal*, 6(1), 35. <https://doi.org/10.21111/atj.v6i1.7234>
- Kenarni, N. R. (2023). Pemanfaatan minyak jelantah dalam pembuatan lilin aromaterapi. *Jurnal Bina Desa*, 4(3), 343–349. <https://doi.org/10.15294/jbd.v4i3.39225>
- Khuzaimah, S. (2020). Pemanfaatan minyak jelantah dan ekstrak kulit citrus reticulata sebagai bahan pembuatan sabun. *E-Journal Universitas Nahdlatul Ulama Al Ghazali*, 2(17), 1–21.
- Kumar, A., Bhayana, S., Singh, P. K., Tripathi, A. D., Paul, V., Balodi, V., & Agarwal, A. (2025). Valorization of used cooking oil: challenges, current developments, life cycle assessment and future prospects. *Discover Sustainability* 2025 6:1, 6(1), 1–31. <https://doi.org/10.1007/S43621-025-00905-7>
- Mahmudah, R., & Shofiah, N. (2023). From waste to wealth: A novel approach for empowering society through recycling used cooking oil into soap. *Journal of Community Service and Empowerment*, 4(2), 343–350. <https://doi.org/10.22219/jcse.v4i2.25816>
- Maulida, N. U., & Makmuroh, U. (2023). House warac (household waste oil for relaxing aromatherapy candle). *Jurnal Wawasan Pendidikan*, 3(2), 504–509. <https://doi.org/10.26877/WP.V3i2.16347>

- Mulia, Y. E. (2018). Pemanfaatan minyak goreng bekas (minyak jelantah) menjadi sabun cair cuci piring. In *Sekolah Tinggi Teknologi Industri (STTIND) Padang*.
- Murti, F. T., Fitrianti, S., Tejawati, A. D. A., Muminin, H., Lutfiani, V. N., & Rahman, T. (2025). Utilization of used cooking oil into aromatherapycandles and liquid soap in the pringsurat hamlet community, Gunungkidul. *ACCEPT: Annual Conference on Community Engagement for Peaceful Transformation*, 4(1), 270–275. <https://conference.uin-suka.ac.id/index.php/accept/article/view/1726>
- Nirwana, T. P., & Ernawati, E. (2023). Pelatihan Pembuatan Lilin Dalam Pemanfaatan Limbah Minyak Jelantah. *Sahid Da'watii Dedicate*, 1(02), 23–28. <https://doi.org/10.56406/sahiddawatiidedicate.v1i02.469>
- Permadi, A., Setyawan, M., Rahmawati, N., & Sembiring, N. S. (2022). Pelatihan Pembuatan Lilin Aromaterapi Berbasis Minyak Jelantah di Dusun Sidomoyo Kragilan Godean Sleman D.I. Yogyakarta. *Seminar Nasional Penelitian Dan Pengabdian Kepada Masyarakat*, 4(1), 182–189.
- Putra, F. G., Puspita Sari, A., Qurotunnisa, A., Rukmana, A., Darmayanti, R., & Raden Intan Lampung, U. (2023). What are the advantages of using leftover cooking oil waste as an aromatherapy candle to prevent pollution? *Jurnal Inovasi Dan Pengembangan Hasil Pengabdian Masyarakat*, 1(2), 59–63. <https://doi.org/10.61650/JIP-DIMAS.V1I2.230>
- Rahayu, R. A. P. (2021). Effect of collaborative writing combined with blog online learning on indonesian efl learners' writing skill across motivation. *SALEE: Study of Applied Linguistics and English Education*, 2(1), 87–98. <https://doi.org/10.35961/salee.v2i01.219>
- Ridwan, H. M., Adifani, A., & Mufida, V. (2023). Application of an automated system for converting waste cooking oil into aromatherapy candles. *Recent in Engineering Science and Technology*, 1(03), 13–25. <https://doi.org/10.59511/RIESTECH.V1I03.20>
- Setyaningsih, M., Astuti, Y., Broto, A. H., Palupi, D. P., Arsy, I., Putri Octavianingrum, & Yeni Elmi. (2018). *Pemanfaatan pupuk cair organik limbah sayur dan buah dari pasar tradisional kramat jati sebagai alternatif nutrisi pada perangkat hidroponik*. Fakultas Keguruan dan Ilmu Pendidikan Universitas Muhammadiyah Prof. Dr. Hamka.
- United Nations. Sustainable development. Department of Economi and Social Affairs. <https://sdgs.un.org/goals>
- Vinet, L., & Zhedanov, A. (2011). A “missing” family of classical orthogonal polynomials. *Journal of Physics A: Mathematical and Theoretical*, 44(8), 17–21. <https://doi.org/10.1088/1751-8113/44/8/085201>
- Wal Ikram, M., Rengko, S. H., & Author, C. (2025). Socialization and practice of utilizing used cooking oil into candles. *Macca: Journal of Linguistic Applied Research*, 2(1), 264–271. <https://journal.adityarifqisam.org/index.php/macca/article/view/110>
- Wardani, D. T. K., Saptutyningsih, E., & Fitri, S. A. (2021). Ekonomi Kreatif: Pemanfaatan limbah jelantah untuk pembuatan lilin aromaterapi. *Prosiding Seminar Nasional Program Pengabdian Masyarakat*. <https://doi.org/10.18196/ppm.32.224>



Enhancing Academic Writing Skills and Ethical Awareness among Sociology Department Students at Halu Oleo University through Reference Management Training

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-12-29 Revised: 2025-03-09 Accepted: 2025-03-28 Published: 2025-04-30 Keywords Mendeley Training Academic Ethics Plagiarism Prevention Reference Management Skill	The study aimed to assess the effectiveness of Mendeley training in improving reference management skills and academic ethics among students in the Sociology Department at Halu Oleo University. Specifically, the research focused on evaluating the impact of the training on students' ability to manage references efficiently and their understanding of academic ethics, particularly in avoiding plagiarism and adhering to proper citation practices. This outreach program involved 50 students, primarily final-year students preparing their theses and research reports. The training program, conducted from November 4 to December 4, 2024, included practical sessions on using Mendeley for reference management, alongside discussions on academic ethics, such as plagiarism prevention and proper citation practices. Data was collected through pre-test and post-test questionnaires, as well as observational analysis during hands-on sessions. The primary outcomes measured were students' understanding of Mendeley, reference management skills, and academic ethics before and after the training. Results showed significant improvements in all areas, with the percentage of students demonstrating a strong understanding of Mendeley, increasing from 30% to 85%, reference management skills from 25% to 80%, and academic ethics awareness from 40% to 85%. The findings underscore the effectiveness of practical, interactive training in enhancing both technical skills and ethical awareness, which can lead to higher-quality academic work. The study highlights the importance of integrating reference management training and academic ethics into community engagement initiatives, with the potential to improve the overall academic integrity of students' scholarly work.
Kata Kunci Pelatihan Mendeley Etika Akademik Pencegahan Plagiarisme Keterampilan Manajemen Referensi	Meningkatkan Keterampilan Menulis Akademik dan Kesadaran Etika Mahasiswa Jurusan Sosiologi Universitas Halu Oleo melalui Pelatihan Manajemen Referensi. Penelitian ini bertujuan untuk menilai efektivitas pelatihan Mendeley dalam meningkatkan keterampilan manajemen referensi dan etika akademik di kalangan mahasiswa Jurusan Sosiologi Universitas Halu Oleo. Secara khusus, penelitian ini fokus pada evaluasi dampak pelatihan terhadap kemampuan mahasiswa dalam mengelola referensi secara efisien serta pemahaman mereka terhadap etika akademik, terutama dalam menghindari plagiarisme dan mematuhi praktik sitasi yang benar. Program pengabdian ini melibatkan 50 mahasiswa, yang sebagian besar merupakan mahasiswa tahun akhir yang sedang mempersiapkan tesis dan laporan penelitian mereka. Program pelatihan ini dilaksanakan dari 4 November hingga 4 Desember 2024, dan mencakup sesi praktis penggunaan Mendeley untuk manajemen referensi, serta diskusi mengenai etika akademik, seperti pencegahan plagiarisme dan praktik sitasi yang benar. Data dikumpulkan melalui kuesioner <i>pre-test</i> dan <i>post-test</i>, serta analisis observasional selama sesi praktikum. Hasil utama yang diukur adalah pemahaman mahasiswa terhadap Mendeley, keterampilan manajemen referensi, dan etika akademik sebelum dan setelah pelatihan. Hasil penelitian menunjukkan peningkatan yang signifikan di semua area, dengan persentase mahasiswa yang menunjukkan pemahaman yang kuat terhadap Mendeley meningkat dari 30% menjadi 85%, keterampilan manajemen referensi dari 25% menjadi 80%, dan kesadaran etika akademik dari 40% menjadi 85%. Temuan ini menegaskan efektivitas pelatihan praktis dan interaktif dalam meningkatkan keterampilan teknis serta kesadaran etika, yang dapat menghasilkan karya akademik yang lebih berkualitas. Penelitian ini juga menyoroti pentingnya mengintegrasikan pelatihan manajemen referensi dan etika akademik dalam inisiatif pengabdian masyarakat, dengan potensi untuk meningkatkan integritas akademik secara keseluruhan pada karya ilmiah mahasiswa.

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INTRODUCTION

The writing of academic papers is a fundamental competency that students must master during their higher education journey. For students in the Sociology Department at the Faculty of Social and Political Sciences (FISIP) at Halu Oleo University, this skill is crucial not only for meeting academic requirements but also as a means to contribute to the development of knowledge through systematic research. In the academic writing process, reference management becomes an essential aspect that cannot be overlooked, as it directly influences academic integrity, scholarly quality, and the accuracy of the information presented.

In the context of scientific writing, proper reference management is a cornerstone of academic rigor. Managing sources appropriately helps maintain the credibility of the research and ensures the transparency of the sources of information (Paas et al., 2003). Failure to manage references correctly may lead to issues such as academic misconduct, including plagiarism, which can undermine the scholarly value of the work (Pecorari, 2003). Reference management tools are, therefore, indispensable for maintaining the integrity of academic writing, particularly for students who are learning how to produce rigorous scholarly work (Aljuaid, 2024).

However, despite its importance, reference management often presents significant challenges for students. Based on research, many students struggle to create a proper bibliography or cite sources in the correct format, which can result in technical errors and even plagiarism (Azizah & Budiman, 2022). Plagiarism frequently occurs due to insufficient understanding of proper citation techniques and reference management (Ahmad & Fauzi, 2024). This problem is not unique to students in Indonesia; research suggests that students globally often lack sufficient training in citation practices, which significantly contributes to academic dishonesty (M. S. Williams & Hosek, 2003).

To address these challenges, academic reference management tools have been developed to streamline the process (Williams & Woods, 2024). One of the most widely used tools is Mendeley, a software platform that allows users to manage, store, and automatically format references. Mendeley also provides features that enable students to organize and share references, simplifying the writing process and ensuring that citations conform to academic standards (Nguyen et al., 2024). The software allows for easy insertion of citations within the text and the automatic generation of bibliographies in various formats, such as APA, MLA, and Chicago Style (Vijai et al., 2019).

Mendeley not only saves time and reduces errors in the formatting of references but also promotes better organization of the research process (Fajrianti & Kaif, 2023). Mendeley enhances researchers' productivity by providing a centralized repository for managing and organizing scholarly literature (Raharjo et al., 2022). For students, using Mendeley can reduce the likelihood of technical errors in reference management, as it ensures accuracy and consistency in citation formatting (Iskandar & Patak, 2019). Moreover, Mendeley offers social features, such as the ability to join research groups and share references with peers (Jeng et al., 2015). This fosters collaboration and allows students to engage with the global academic community, making it a versatile tool for academic work (Williams & Woods, 2024).

Despite the clear advantages of Mendeley, many students have yet to fully embrace or effectively utilize the application (Hicks & Sinkinson, 2015). This gap is particularly evident in institutions with limited exposure to technology training in reference management. A lack of training on software tools like Mendeley often prevents students from maximizing their potential, thereby hindering the quality of their academic work (Ayuni & Meirani, 2022). The indicating that students' lack of training in academic software tools correlates with lower-quality research outputs (Meridha, 2024).

This gap in knowledge and skills can be attributed to insufficient socialization and exposure to these tools during academic training (Pratama et al., 2023). While Mendeley is a highly effective tool, students often fail to take full advantage of its capabilities because of limited understanding of its features (Ariyanti & Fitriana, 2019). As a result, there is a pressing need for more targeted efforts to introduce students to the full range of functionalities that Mendeley offers.

In response to this need, our outreach program aims to provide training on the use of Mendeley for students in the Sociology Department at Halu Oleo University. This training is designed to familiarize students with the various features of Mendeley that can help them manage references more efficiently and accurately. By offering hands-on training, the goal is to reduce technical errors in students' academic writing, enhance their understanding of citation standards, and encourage greater adherence to academic integrity (Silvia, 2019).

Teaching students how to use reference management tools not only improves their technical writing skills but also increases their awareness of academic ethics, including the prevention of plagiarism (Houghton & Houghton, 2019). Students properly trained in reference management software are more likely to produce high-quality academic work that adheres to ethical standards (Swales & Feak, 2012). Through this program, students will be equipped with the skills to efficiently manage their references, which in turn will allow them to focus more on the content of their research. Mendeley's automatic citation features will also reduce the likelihood of errors, ultimately improving the quality of their academic writing (Iskandar & Patak, 2019). Furthermore, the training aims to foster a greater appreciation for academic ethics, particularly the importance of citation practices in avoiding plagiarism (Foltýnek et al., 2020).

In addition to the academic focus of the training program, it is essential to recognize how this initiative aligns with the United Nations Sustainable Development Goal (SDG) 4: Quality Education. By enhancing academic writing skills and promoting ethical practices among students, this outreach program contributes to improving the quality of education at Halu Oleo University. It aims to provide students with the necessary tools and knowledge to excel in their academic pursuits, thereby fostering a more ethical, inclusive, and high-quality academic environment.

The ability to manage references effectively is a vital skill for academic success, particularly for students at Halu Oleo University's Sociology Department. The introduction of Mendeley as a reference management tool has the potential to

significantly improve students' ability to manage references efficiently and enhance their understanding of academic ethics, particularly in preventing plagiarism and adhering to proper citation practices. Through targeted training, we aim to equip students with the necessary skills to effectively use Mendeley for reference management while fostering a deeper awareness of academic ethics. In the long term, this initiative not only supports students in their thesis and research report preparation but also promotes ethical academic practices, contributing to higher-quality academic work and greater academic integrity.

METHOD

This outreach program was designed to enhance the reference management skills and academic ethics awareness of students in the Sociology Department at Halu Oleo University. The program was conducted from November 4 to December 4, 2024, at the university campus. The primary objective was to equip students with the technical skills to use Mendeley effectively for reference management while fostering a deeper understanding of academic ethics, particularly in avoiding plagiarism and adhering to proper citation practices. The program was initiated by the Department of Sociology in collaboration with the Faculty of Social and Political Sciences, with support from the Directorate of Research and Community Service (DPPM) at Halu Oleo University.

Participants and Selection Criteria

The program involved 50 students from the Sociology Department, primarily final-year students who were in the process of preparing their theses and research reports. Participants were selected based on their academic needs, particularly those who had demonstrated challenges in reference management and academic writing in previous coursework. The selection process was conducted in consultation with academic advisors and department heads to ensure that the participants would benefit most from the training.

Program Activities and Implementation

The program was structured into three main phases: pre-test, training, and post-test. Each phase was designed to achieve specific objectives and ensure a comprehensive learning experience for the participants.

1. Pre-test

The pre-test was administered before the outreach sessions to gauge the students' initial understanding of reference management and the use of Mendeley. The pre-test questions covered several aspects, including basic knowledge of reference management tools, how to cite sources and format bibliographies, and an understanding of academic ethics in scientific writing. The results of the pre-test helped identify the extent to which students had mastered the material before the training (Oo et al., 2024).

2. Outreach and Training

This phase comprised several sessions, outlined as follows:

- a. Theoretical Introduction: In this session, students were introduced to the importance of proper reference management in academic writing. The session also covered academic ethics, such as avoiding plagiarism and the importance of giving proper credit to original authors (Sekarini et al., 2024). The goal of this session was to raise students' awareness about the ethical aspects of research.
- b. Introduction to Mendeley: The training began with an introduction to the basics of Mendeley, including the main features of the application and its benefits in automatically generating bibliographies. The instructor demonstrated the installation process, how to add references, organize references into folders, and how to use Mendeley for inserting citations in the text and generating bibliographies.
- c. Hands-on Practice: After the introduction, students were given the opportunity to practice using Mendeley. Each student was asked to install Mendeley on their device, add references from relevant sources, and create citations and bibliographies in their research drafts. This practice session was supported by facilitators who provided direct technical assistance.
- d. Group Discussion: After the practice session, students were divided into small groups to discuss their experiences using Mendeley, the challenges they faced, and potential solutions they could apply.

3. Post-test

Following the training session, a post-test was administered to measure the improvement in the students' understanding of Mendeley and reference management. The post-test included questions similar to those in the pre-test, but with a greater emphasis on practical use, such as how to format bibliographies in different citation styles (APA, MLA, Chicago) and how to correctly insert citations within the text (Stratton, 2019).

Data Analysis Techniques

The data collected from the pre-test and post-test were analyzed using quantitative descriptive techniques to assess the improvement in students' understanding and skills. The analysis focused on three main indicators: (1) understanding of Mendeley, measured by the percentage of students who demonstrated proficiency in using the software; (2) reference

management skills, evaluated based on the students' ability to manage references efficiently and generate accurate bibliographies; and (3) academic ethics awareness, assessed through questions related to plagiarism prevention and proper citation practices.

Observational data from the training sessions were analyzed qualitatively to identify challenges faced by students and the effectiveness of the training methods. The results of the data analysis were used to evaluate the overall success of the program and to provide recommendations for future training initiatives.

RESULTS AND DISCUSSION

Implementation of the Training

The training program, Utilizing Mendeley in Students' Academic Writing, was structured to ensure active participation and engagement from the students (Figure 1). The sessions were designed to be interactive, combining theoretical knowledge with hands-on practice. Students were encouraged to ask questions and share their experiences throughout the training, which fostered a collaborative learning environment (Figure 2).



Figure 1. The training program



Figure 2. Students participating in the Mendeley Training Program

During the training, students demonstrated high levels of engagement, particularly during the hands-on practice sessions. Most students actively participated in the installation of Mendeley, adding references, and generating citations and bibliographies. The facilitators observed that students were eager to learn and showed significant interest in mastering the software. The group discussions that followed the practical sessions provided an opportunity for students to share their challenges and solutions, further enhancing their understanding of the tool.

Many students expressed appreciation for the practical approach, which allowed them to immediately apply what they had learned to their ongoing research projects. One student commented, "*The hands-on practice was very helpful. I finally understand how to use Mendeley to manage my references efficiently.*" Another student noted, "*The discussion on academic ethics was eye-opening. I now realize how important it is to cite sources properly to avoid plagiarism.*" However, some students faced challenges, particularly in integrating Mendeley with their word processing software. One student mentioned, "*I had trouble getting Mendeley to work with Microsoft Word, but the facilitators were very helpful in guiding me through the process.*" These challenges were addressed during the training, and facilitators provided additional support to ensure that all students could successfully use the software.

Observations during the training sessions revealed that students were highly engaged, especially during the practical exercises. The facilitators noted that students who initially struggled with the software showed significant improvement by the end of the training. The interactive nature of the sessions, combined with the immediate applicability of the skills learned, contributed to the high levels of engagement and satisfaction among participants.

Pre-test and Post-test Results

The data collected from the pre-test and post-test indicate a significant improvement in students' understanding of Mendeley usage and reference management after the training. The average pre-test score for understanding Mendeley was 30%, while the post-training average score increased to 85%. Similarly, students' understanding of reference management improved from 25% to 80% following the training sessions (Table 1).

Table 1. Evaluation Results of Students' Skills

Aspect	Before Outreach	After Outreach
Understanding Mendeley	30%	85%
Reference Management	25%	80%
Academic Ethics	40%	85%

The comparison between pre-test and post-test results demonstrates substantial knowledge gains across all measured areas. The most significant improvement was observed in students' understanding of Mendeley, which increased by 55 percentage points. This indicates that the hands-on training and practical sessions were highly effective in familiarizing students with the software. Similarly, reference management skills improved by 55 percentage points, suggesting that students became more proficient in organizing and citing references after the training. Academic ethics awareness also saw a significant increase of 45 percentage points, reflecting a better understanding of plagiarism prevention and proper citation practices.

The improvement in test scores can be attributed to several factors. First, the interactive and practical nature of the training allowed students to immediately apply what they learned, reinforcing their understanding of Mendeley and reference management. The hands-on sessions, supported by facilitators, provided students with the opportunity to practice using the software in real-time, which helped solidify their skills. Second, the structured approach of the training, which included both theoretical and practical components, ensured that students not only learned how to use Mendeley but also understood the importance of academic ethics. The discussions on plagiarism and proper citation practices were particularly impactful, as they addressed a common gap in students' knowledge.

However, some concepts were harder to grasp than others. For example, integrating Mendeley with word processing software (e.g., Microsoft Word) proved challenging for some students, as reflected in the qualitative feedback. Additionally, selecting credible and relevant references remained a difficulty for some participants, indicating that while the training improved technical skills, further guidance on evaluating sources may be needed.

Overall, the results highlight the effectiveness of the training program in enhancing students' technical skills and ethical awareness. The combination of practical exercises, theoretical discussions, and facilitator support created a conducive learning environment that led to significant improvements in students' abilities to manage references and adhere to academic standards.

Hands-on Practice Results and Technical Challenges

During the hands-on sessions, students were given the opportunity to use Mendeley with the assistance of facilitators. Most students demonstrated good skills in adding references to Mendeley, organizing them into folders, and inserting citations within their text. Direct observations showed that students were able to format bibliographies correctly according to the desired citation styles (APA, MLA, Chicago, etc.) (Cahnia, 2021).

However, some challenges were observed during the practice sessions. A few students had difficulty integrating Mendeley with their word processing software (Microsoft Word), particularly with the automatic citation insertion and the real-time update of bibliographies. These challenges were likely related to a lack of familiarity with certain features of Mendeley, despite following the instructions carefully. The Mendeley is a highly useful tool, some users, especially beginners, often require time to fully understand all its features.

Additionally, some students expressed confusion regarding how to select relevant and credible references. This indicates that, while students received technical assistance in reference management, they still needed more guidance in selecting appropriate sources, especially in the context of social science research, which requires valid and relevant references. Mendeley can indeed simplify reference management, the selection of appropriate references still depends on students' ability to evaluate the quality of the sources they use.

One of the central objectives of this outreach program was to enhance students' academic writing skills, particularly by improving their ability to manage references effectively and fostering an understanding of academic ethics. This included emphasizing the importance of avoiding plagiarism and adhering to proper citation practices in scholarly writing. Academic integrity is a fundamental principle of research and scholarly work, ensuring that the contributions of others are properly

acknowledged and that the intellectual property rights of authors are respected. Prior to the training, approximately 40% of students demonstrated a sufficient understanding of these principles. This indicates that a significant portion of students lacked awareness of the ethical standards governing academic writing, which could potentially lead to unintentional plagiarism or improper citation.

After completing the training, the percentage of students who demonstrated a robust understanding of academic ethics increased dramatically to 85%. This shift indicates a significant positive change in students' awareness and comprehension of the ethical implications in academic writing. The training provided students with essential insights into the necessity of citing sources accurately, the consequences of plagiarism, and the broader ethical framework that underpins scholarly work. By the end of the program, students were not only more informed about the significance of academic integrity but also more confident in their ability to apply these ethical standards in their own research and writing.

This improvement in understanding academic ethics is consistent with the idea that reference management tools like Mendeley play a critical role in enhancing students' awareness of academic ethics (Basri & Patak, 2015). Mendeley, by automatically generating citations and bibliographies in various citation styles (APA, MLA, Chicago, etc.), effectively reminds students to properly attribute the sources they reference in their work. This automation minimizes the risk of errors in citation and encourages the practice of accurately crediting original authors, thus helping to reduce the risk of plagiarism (Anuradha, 2023). The software also provides an easy-to-use interface for managing references, which allows students to organize their sources in a structured way and ensures that all necessary references are included in their final manuscript.

The ability of Mendeley to simplify citation practices indirectly fosters academic integrity by supporting students in following ethical standards (Curran, 2011). By alleviating the technical burdens associated with reference management, Mendeley enables students to focus more on the intellectual aspects of their research, such as analysis, argumentation, and synthesis, rather than worrying about the mechanics of citation. In this sense, Mendeley serves as both a practical tool for managing references and a pedagogical instrument that reinforces the importance of ethical conduct in academic writing.

Moreover, the training also emphasized the broader implications of academic ethics beyond just citation practices. Students were encouraged to view ethical considerations as integral to the quality and credibility of their academic work. This included discussions on issues such as intellectual property rights, the importance of originality in research, and the ethical use of data and sources. By embedding these ethical considerations into the training, students were better prepared to engage in academic research in a manner that upholds the values of honesty, integrity, and fairness.

This heightened awareness of academic ethics is not just beneficial for students' immediate academic work but also serves to shape their approach to research and scholarly practice in the future (Nikmah, 2019). By cultivating a strong foundation in academic integrity early in their academic careers, students are more likely to carry these values forward into their professional lives, contributing to the overall credibility and trustworthiness of academic research.

The training, therefore, did not just serve as an instructional session on how to use Mendeley effectively but also played a crucial role in fostering a culture of academic integrity among students. It reinforced the idea that proper citation is not merely a technical requirement but a core principle that underpins the trust and validity of academic work. As a result, this outreach has made a lasting impact on students' understanding of the ethical responsibilities involved in scholarly writing and research.

Impact of Outreach on the Quality of Academic Work

In addition to enhancing students' technical proficiency and understanding academic ethics, the primary objective of this training was to significantly improve the overall quality of students' academic work. The ability to efficiently manage references is crucial for producing scholarly writing that is coherent, organized, and aligned with academic standards. A key aspect of high-quality academic work is ensuring that references and citations are accurately formatted and properly attributed, a task that often presents challenges for students. Prior to the training, many students struggled with this aspect, leading to inconsistencies in citation styles, formatting errors, and, in some cases, failure to properly acknowledge the sources of ideas or data. These issues not only affected the technical quality of their work but also undermined its credibility and scholarly rigor.

Following the training, students were able to produce more structured and organized academic papers, with citations and bibliographies that adhered to the relevant academic standards, such as APA, MLA, and Chicago styles. The use of Mendeley simplified this process by automating citation generation and bibliography creation, ensuring that all references were formatted correctly and consistently throughout the document. This automated process eliminated common technical errors associated with manual citation entry, such as incorrect formatting, inconsistent punctuation, or omitted source details. As a result, students were able to focus their attention on the content and analysis of their academic work, rather than being overwhelmed by the complexities of reference management.

The improvement in reference management also had a direct impact on the overall coherence and clarity of students' academic papers. With a well-organized bibliography and properly formatted citations, students' work appeared more professional, and the logical flow of their arguments and ideas was enhanced (Helmi et al., 2022). A properly cited paper demonstrates a careful and rigorous approach to research, which is a key criterion in academic evaluation. Furthermore, by following established citation conventions, students were able to present their sources in a way that was accessible and

transparent to their readers, making it easier for others to verify and build upon their research. This, in turn, contributed to the scholarly value of their work.

Moreover, the enhanced ability to manage references allowed students to streamline the writing process. Instead of spending valuable time manually entering and formatting citations, students could now concentrate on more intellectually demanding tasks, such as synthesizing research findings, developing arguments, and refining their critical analysis. This shift enabled them to allocate their time more effectively, leading to more thoughtful and well-developed academic papers. The reduction in the time and effort required for reference management also alleviated the stress often associated with thesis or research report writing, contributing to a more positive and productive academic experience.

The positive impact of Mendeley on the quality of students' academic work extends beyond the technicalities of citation. The use of reference management software such as Mendeley can enhance the quality of academic work by significantly reducing technical errors and speeding up the writing process (Muksin & Hasanah, 2023). This enables students to focus more on developing and refining the intellectual content of their papers, rather than struggling with the mechanical aspects of citation management (Syaharuddin et al., 2021). Furthermore, by ensuring that all sources are cited correctly, Mendeley supports the creation of work that is both ethically sound and academically rigorous. This is especially important in academic environments where credibility and originality are paramount, as proper citation helps to safeguard against accusations of plagiarism and demonstrates academic integrity.

In addition to reducing errors and improving efficiency, Mendeley also encourages students to engage more deeply with the sources they are citing. The process of adding and organizing references in Mendeley requires students to interact with the literature more thoughtfully, which may foster a better understanding of the research landscape and contribute to a more thorough and critical approach to their own work. By organizing references within the software, students are able to see connections between sources, identify gaps in the literature, and develop a more nuanced understanding of their research topic (Hafizd et al., 2024). This deeper engagement with academic material can result in more insightful and well-informed academic writing.

Furthermore, the training provided students with a tool that can help them throughout their academic careers, from writing undergraduate theses to conducting graduate-level research. The skills they acquired in reference management will be applicable in future academic and professional contexts, where efficient organization of sources and adherence to ethical research practices remain critical. By fostering these skills early in their academic journey, the training lays a foundation for the continued improvement of their research and writing abilities in the future.

Overall, the outreach and training not only equipped students with the technical skills necessary to manage references more efficiently but also empowered them to produce higher-quality academic work. By reducing the technical difficulties associated with citation and bibliography formatting, and by fostering a deeper engagement with academic sources, the training contributed to the development of students' critical thinking, analytical abilities, and overall scholarly rigor. As students continue to apply these skills in their academic work, the positive impact of the training on the quality of their research and writing will likely extend beyond their current studies, enhancing the academic community's trust in their work and further supporting their intellectual growth.

Evaluation and Recommendations

The outreach program successfully achieved its objectives, as evidenced by the significant improvements in students' understanding of Mendeley, reference management skills, and awareness of academic ethics. The pre-test and post-test results, along with qualitative feedback from participants, indicate that the training was highly effective in enhancing students' technical abilities and ethical awareness. The majority of students reported feeling more confident in using Mendeley to manage references and format citations correctly, which directly contributed to the quality of their academic work.

Feedback from participants highlighted the practical and interactive nature of the training as a key factor in its success. Students appreciated the hands-on sessions, which allowed them to immediately apply what they learned to their ongoing research projects. One student commented, *"The training was very practical and easy to follow. I now feel more confident in using Mendeley for my thesis."* Another student noted, *"The discussion on academic ethics was eye-opening. I now understand the importance of proper citation and avoiding plagiarism."*

However, some challenges were identified during the training. A few students faced difficulties integrating Mendeley with word processing software, particularly with automatic citation insertion and real-time bibliography updates. Additionally, some students expressed the need for more guidance on selecting credible and relevant references, especially in the context of social science research.

Based on the evaluation results and feedback from participants, the following recommendations are proposed to further enhance the effectiveness of similar programs in the future:

1. Follow-up Training Sessions: To address the challenges faced by students, follow-up training sessions should be organized. These sessions could focus on advanced features of Mendeley, such as integrating the software with different word processors and troubleshooting common technical issues. This would help students who still struggle with certain aspects of the software.

2. Workshops on Citation Strategies: Additional workshops could be conducted to provide more in-depth guidance on citation strategies, including how to select credible and relevant references. These workshops could also cover advanced citation styles and techniques for managing large reference libraries, which would be particularly beneficial for students working on extensive research projects.
3. Enhanced Focus on Academic Ethics: While the training successfully raised awareness of academic ethics, future programs could include more detailed discussions on topics such as intellectual property rights, data ethics, and the ethical use of sources. This would further reinforce the importance of academic integrity in scholarly work.
4. Hands-on Practice with Real-world Examples: Incorporating real-world examples and case studies into the training could help students better understand how to apply reference management and citation practices in their own research. This approach would make the training more relatable and practical for students.
5. Ongoing Support and Resources: Providing students with access to ongoing support, such as online tutorials, user guides, and a dedicated helpdesk, would ensure that they can continue to improve their skills even after the training has ended. This would also help address any technical issues that may arise during their research.

By implementing these recommendations, future training programs can build on the success of this initiative and further enhance students' ability to produce high-quality academic work that adheres to ethical standards.

CONCLUSION

Based on the results of the Mendeley outreach and training activities, it can be concluded that the training successfully enhanced students' skills in reference management and their understanding of academic ethics. Prior to the training, many students struggled with using Mendeley, including adding references, managing them, and formatting bibliographies correctly. After the training, the majority of students demonstrated significant improvement in their technical skills, indicating that a practical and interactive training approach can have an immediate positive impact. Furthermore, the training effectively introduced students to the importance of academic ethics, particularly in avoiding plagiarism and adhering to proper citation practices. This increased awareness is expected to reduce technical errors in citation and help students produce higher-quality academic work that meets academic standards.

However, despite the positive outcomes, several challenges remain, such as difficulties integrating Mendeley with word processors and selecting relevant references. These challenges highlight the need for continued training and skill development in academic writing. Academic writing is a complex process that requires not only technical proficiency but also a deep understanding of ethical practices and critical thinking. Therefore, it is essential to reinforce the importance of ongoing learning and support for students as they navigate the demands of scholarly work. Future initiatives should focus on providing follow-up training sessions that delve deeper into advanced features of reference management tools and offer more comprehensive guidance on citation strategies.

In conclusion, while the Mendeley training program has made significant strides in improving students' reference management skills and ethical awareness, the journey toward academic excellence does not end here. Continued investment in training and skill development is crucial to sustaining these gains and empowering students to achieve their full potential as scholars and researchers. By fostering a culture of continuous improvement and lifelong learning, institutions can ensure that students are well-equipped to meet the challenges of academic writing and contribute meaningfully to their fields of study.

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REFERENCES

- Ahmad, H., & Fauzi, M. A. (2024). Plagiarism in Academic Writing in Higher Education Institutions: A Bibliometric Analysis. *International Journal on Social and Education Sciences*, 6(1), 64–84. <https://doi.org/10.46328/ijonses.623>
- Aljuaid, H. (2024). The Impact of Artificial Intelligence Tools on Academic Writing Instruction in Higher Education: A Systematic Review. *Arab World English Journal*, 1(1), 26–55. <https://doi.org/10.24093/awej/ChatGPT.2>
- Anuradha, D. P. (2023). THE PLAGIARISM CHECKER USING MACHINE LEARNING. *INTERANTIONAL JOURNAL OF*

- SCIENTIFIC RESEARCH IN ENGINEERING AND MANAGEMENT, 07(04). <https://doi.org/10.55041/IJSREM18949>
- Ariyanti, A., & Fitriana, R. (2019). EFL Students Perception on Mendeley Reference Manager in Thesis Writing. *Proceedings of the Proceedings of the 1st International Conference on Business, Law And Pedagogy, ICBLP 2019, 13-15 February 2019, Sidoarjo, Indonesia*. <https://doi.org/10.4108/eai.16-10-2019.163223>
- Ayuni, R., & Meirani, M. (2022). Training on The Utilization of Mendeley and Similarity in Increasing The Quality of Students' Academic Work. *Room of Civil Society Development*, 1(1), 34–38. <https://doi.org/10.59110/rcsd.v1i1.4>
- Azizah, U. A., & Budiman, A. (2022). Challenges in Writing Academic Papers for International Publication Among Indonesian Graduates Students. *JEELS (Journal of English Education and Linguistics Studies)*, 4(2), 175–197. <https://doi.org/10.30762/jeels.v4i2.405>
- Basri, M., & Patak, A. A. (2015). Exploring Indonesian students' perception on Mendeley Reference Management Software in academic writing. *2015 2nd International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE)*, 8–13. <https://doi.org/10.1109/ICITACEE.2015.7437761>
- Cahnia, Z. A. (2021). Pemanfaatan Mendeley Sebagai Manajemen Referensi pada Penulisan Skripsi Mahasiswa Program Studi Perpustakaan dan Sains Informasi Universitas Bengkulu. *Palimpsest: Jurnal Ilmu Informasi Dan Perpustakaan*, 12(1), 48–54. <https://doi.org/10.20473/pjil.v12i1.26471>
- Curran, M. (2011). Mendeley <http://www.mendeley.com>. *Technical Services Quarterly*, 28(4), 454–456. <https://doi.org/10.1080/07317131.2011.598069>
- Fajrianti, F., & Kaif, S. H. (2023). Pelatihan Penggunaan Mendeley Reference Dalam Penulisan Karya Ilmiah. *Lamahu: Jurnal Pengabdian Masyarakat Terintegrasi*, 2(2), 123–128. <https://doi.org/10.34312/ljpmt.v2i2.20590>
- Foltýnek, T., Dlabolová, D., Anohina-Naumeca, A., Razi, S., Kravjar, J., Kamzola, L., Guerrero-Dib, J., Çelik, Ö., & Weber-Wulff, D. (2020). Testing of support tools for plagiarism detection. *International Journal of Educational Technology in Higher Education*, 17(1), 46. <https://doi.org/10.1186/s41239-020-00192-4>
- Hafizd, J. Z., Rana, M., & Alfari, D. (2024). Pentingnya Mendeley dalam Meningkatkan Efisiensi Pengelolaan Literatur dan Referensi pada Mahasiswa Fakultas Syariah UIN Siber Syekh Nurjati Cirebon. *Jurnal Pendidikan Impola*, 1(2), 98–107. <https://doi.org/10.70047/jpi.v1i2.142>
- Helmi, D., Asep, A., & Ansiska, P. (2022). PENINGKATAN KUALITAS KARYA TULIS ILMIAH MAHASISWA MELALUI PELATIHAN MANAJEMEN REFERENSI BERBASIS MENDELEY. *PAKEM : Jurnal Pengabdian Kepada Masyarakat*, 2(2), 132–137. <https://doi.org/10.30598/pakem.2.2.132-137>
- Hicks, A., & Sinkinson, C. (2015). Examining Mendeley: Designing Learning Opportunities for Digital Scholarship. *Portal: Libraries and the Academy*, 15(3), 531–549. <https://doi.org/10.1353/pla.2015.0035>
- Houghton, P. M., & Houghton, T. J. (2019). *Avoiding Plagiarism: The Easy Way! (Writing with Honesty and Integrity)*. XanEdu Publishing Inc.
- Iskandar, -, & Patak, A. A. (2019). The significance of Mendeley usage on the accuracy of citation and references. *International Journal of Humanities and Innovation (IJHI)*, 2(4), 108–114. <https://doi.org/10.33750/ijhi.v2i4.51>
- Jeng, W., He, D., & Jiang, J. (2015). User participation in an academic social networking service: A survey of open group users on <scp>M</scp> endeley. *Journal of the Association for Information Science and Technology*, 66(5), 890–904. <https://doi.org/10.1002/asi.23225>
- Meridha, J. M. (2024). The causes of poor digital literacy in educational practice, and possible solutions among the stakeholders: a systematic literature review. *SN Social Sciences*, 4(11), 210. <https://doi.org/10.1007/s43545-024-01010-8>
- Muksin, A., & Hasanah, S. (2023). Kajian Yuridis Tahapan Pemilihan Kepala Daerah Serentak Tahun 2024. *Politea : Jurnal Politik Islam*, 6(2), 67–83. <https://doi.org/10.20414/politea.v6i2.8524>
- Nguyen, H. L., Nguyen, T. L., Pham, T. Q., & Le, D. H. (2024). Perceptions of Postgraduates Towards Using Citation Management Software in Academic Writing: A Case Study in a Vietnamese University. *Proceedings of the AsiaCALL International Conference*, 6, 35–53. <https://doi.org/10.54855/paic.2463>
- Nikmah, D. N. (2019). Hubungan Sikap Ilmiah, Kebebasan Akademik, dan Etika. *Jurnal Kajian Teori Dan Praktik Kependidikan*, 4(1), 29–44. <http://journal2.um.ac.id/index.php/jktpk>
- Oo, C. Z., Alonzo, D., Asih, R., Pelobillo, G., Lim, R., San, N. M. H., & O'Neill, S. (2024). Implementing school-based assessment reforms to enhance student learning: a systematic review. *Educational Assessment, Evaluation and Accountability*, 36(1), 7–30. <https://doi.org/10.1007/s11092-023-09420-7>
- Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive Load Theory and Instructional Design: Recent Developments. *Educational Psychologist*, 38(1), 1–4. https://doi.org/10.1207/S15326985EP3801_1
- Pecorari, D. (2003). Good and original: Plagiarism and patchwriting in academic second-language writing. *Journal of Second Language Writing*, 12(4), 317–345. <https://doi.org/10.1016/j.jslw.2003.08.004>
- Pratama, B. I., Pratama, M. R., & Sekti Ari, D. P. (2023). Mendeley untuk Semua: Sosialisasi Penggunaan Mendeley untuk Penulisan Akademik dan Non Akademik. *Jurnal Pengabdian Masyarakat (ABDIRA)*, 3(3), 43–52. <https://doi.org/10.31004/abdira.v3i3.347>
- Raharjo, U. D., Rosyad, Y. S., Monika, R., & Khoeriyah, S. M. (2022). Evaluation of the Mendeley Utilization Training for Academic Writing through Usability Approach. *Pengabdian Masyarakat Cendekia (PMC)*, 1(1), 5–8.

<https://doi.org/10.55426/pmc.v1i1.175>

- Sekarini, R. A., Sukamto, B., Siregar, A. M., Dirgantara, M. A., & Perdana, N. A. (2024). Pelatihan Aplikasi Mendeley Dalam Pengelolaan Dan Referensi Tugas Akhir Mahasiswa. *Jurdimas (Jurnal Pengabdian Kepada Masyarakat) Royal*, 7(3), 352–358. <https://doi.org/10.33330/jurdimas.v7i3.3092>
- Silvia, P. J. (2019). *How to write a lot: A practical guide to productive academic writing (2nd ed.)*. American Psychological Association. <https://doi.org/10.1037/0000109-000>
- Stratton, S. J. (2019). Quasi-Experimental Design (Pre-Test and Post-Test Studies) in Prehospital and Disaster Research. *Prehospital and Disaster Medicine*, 34(6), 573–574. <https://doi.org/10.1017/S1049023X19005053>
- Swales, J., & Feak, C. (2012). *Academic Writing for Graduate Students, 3rd Edition*. University of Michigan Press/ELT. <https://doi.org/10.3998/mpub.2173936>
- Syahrudin, S., Mandailina, V., Pramita, D., Rahmaniah, R., Rosada, R., & Negara, H. R. P. (2021). PENINGKATAN KUALITAS PUBLIKASI MAHASISWA DAN SITASI KARYA ILMIAH DOSEN MELALUI WORKSHOP MANAGEMEN SOFTWARE MENDELEY. *Community Development Journal : Jurnal Pengabdian Masyarakat*, 2(1), 8–13. <https://doi.org/10.31004/cdj.v2i1.1367>
- Vijai, C., Natarajan, K., & Elayaraja, M. (2019). Citation Tools and Reference Management Software for Academic Writing. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3514498>
- Williams, L., & Woods, L. (2024). Reference management practices of students, researchers, and academic staff. *The Journal of Academic Librarianship*, 50(3), 102879. <https://doi.org/10.1016/j.acalib.2024.102879>
- Williams, M. S., & Hosek, W. R. (2003). STRATEGIES FOR REDUCING ACADEMIC DISHONESTY. *Journal of Legal Studies Education*, 21(1), 87–107. <https://doi.org/10.1111/j.1744-1722.2003.tb00326.x>



Intercultural Communication Skills for Students of Sabilul Rahmah International Islamic Boarding School Pacet, Mojokerto

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ARTICLE INFO	ABSTRACT
Article history Received: 2024-06-13 Revised: 2024-11-25 Accepted: 2024-12-05 Published: 2025-04-30 Keywords Joint Community Service International Service Cross-cultural Communication	<i>It is important to recognize that globalization has had a significant impact on the world of work. In this context, many companies recognize that cross-cultural communication skills are key to facilitating effective interactions between workers who come from heterogeneous cultural backgrounds. In addition, the phenomenon of an increasing number of individuals migrating from one country to another further strengthens the urgency of developing cross-cultural communication skills in the educational realm. The topic raised in this community service activity is in accordance with the needs of Sabilul Rahmah International Islamic Boarding School (Sabira-IIBS). Located in Sumberam, Sajen, Pacet, Mojokerto, East Java, Sabira IIBS is a pesantren education institution and Madrasah Aliyah (MA) level school with a learning system that combines traditional pesantren Islamic values with modern learning. The curriculum used is based on the national curriculum & international curriculum (Al Azhar University for diniyah & Cambridge for Math, Science & English). The school aims to prepare its graduates to become agents of change in accordance with the purpose of the graduation designation. Most santri are encouraged to continue their studies to favorite universities both domestically and abroad. This community service activity was carried out through collaboration between the Faculty of Cultural Sciences, Universitas 17 Agustus 1945 Surabaya and UniMap Malaysia Perlis. Based on the activities that have been carried out, it can be concluded that after the activity takes place there is an increase in the knowledge and understanding of the participants related to cross-cultural communication from an average understanding of 1.1 on a scale of 4 to 3.7 on a scale of 4. This indicates that the joint community service activities carried out by the academics of FIB Untag Surabaya in collaboration with the academics of Universiti Malaysia Perlis completed successfully and can achieve the goals or targets of this activity. As a result, this activity had a positive impact on increasing the knowledge and understanding of students of partners' institution.</i>
Kata Kunci Pengabdian Masyarakat Bersama Pengabdian Internasional Komunikasi Lintas Budaya	Keterampilan Komunikasi Lintas Budaya Santri Pondok Pesantren Internasional Sabibil Rahmah, Pacet, Mojokerto. Penting untuk diakui bahwa era globalisasi memberikan dampak signifikan terhadap dunia pekerjaan. Dalam konteks ini, banyak perusahaan mengakui bahwa keterampilan komunikasi lintas budaya menjadi kunci untuk memfasilitasi interaksi efektif antar pekerja yang berasal dari latar belakang budaya yang heterogen. Selain itu, fenomena peningkatan jumlah individu yang bermigrasi dari satu negara ke negara lain semakin memperkuat urgensi pengembangan keterampilan komunikasi lintas budaya dalam ranah pendidikan. Topik yang diangkat dalam kegiatan pengabdian masyarakat ini sesuai dengan kebutuhan Sekolah Internasional Sabilul Rahmah (Sabilul Rahmah International Islamic Boarding School [Sabira-IIBS]). Berlokasi di Sumberam, Sajen, Pacet, Mojokerto, Jawa Timur, Sabira IIBS adalah lembaga pendidikan pesantren dan sekolah tingkat Madrasah Aliyah (MA) dengan sistem pembelajaran yang memadukan nilai-nilai keislaman pesantren tradisional dengan pembelajaran modern. Kurikulum yang digunakan berlandaskan pada kurikulum nasional & kurikulum internasional (Al Azhar University untuk diniyah & Cambridge untuk Matematika, Sains & Bahasa Inggris). Sekolah ini bertujuan mempersiapkan lulusannya menjadi agen perubahan sesuai dengan tujuan

peruntukan kelulusan. Sebagian besar santri didorong untuk melanjutkan studi ke perguruan tinggi favorit baik di dalam negeri dan di luar negeri. Kegiatan pengabdian ini terlaksana dari kerjasama antara Fakultas Ilmu Budaya Universitas 17 Agustus 1945 Surabaya dengan UniMap Malaysia Perlis. Berdasarkan kegiatan yang telah dilaksanakan dapat ditarik kesimpulan bahwa setelah kegiatan berlangsung terdapat peningkatan pengetahuan dan pemahaman peserta kegiatan terkait komunikasi lintas budaya dari rata-rata pemahaman sebanyak 1,1 dari skala 4 menjadi 3,7 dari skala 4. Hal ini mengindikasikan bahwa pelaksanaan kegiatan joint community service yang dilaksanakan oleh akademisi FIB Untag Surabaya bekerja sama dengan akademisi Universiti Malaysia Perlis berjalan dengan lancar dan dapat mencapai sasaran atau target dari kegiatan ini. Alhasil, terlaksananya kegiatan ini memberikan dampak positif terhadap peningkatan pengetahuan dan pemahaman mitra.

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INTRODUCTION

Every individual who comes from a particular group, territory, or country inherently possesses the cultural diversity that characterizes their collective identity. The concept of culture cannot be easily defined as it covers a very broad dimension. Culture, in this context, can be understood as a complexity of values, beliefs, and behaviors adopted by members of a community in a particular region or country, which then forms the unique identity of that society (Banks, 1974). Thus, every culture, be it from a region or a country, shows its own uniqueness that enriches the world heritage.

Current scientific and technological developments have had a significant impact on the dynamics of communication. Individuals are no longer limited to communicating with other individuals from their surroundings, but can also interact with individuals from different geographical regions, even different countries. In other words, the phenomenon of interaction or intercultural communication has become inevitable. This view is in line with the argument put forward by Matsumoto [6], which states that the exchange of information between individuals from different cultural backgrounds has become an issue.

With these changes, understanding the cultural diversity of others, especially from different countries, is becoming an increasingly important aspect, especially in the context of today's digital age. It is undeniable that students, as the successor generation of the nation, are not only required to master foreign language skills but also need to have a profound knowledge and understanding of the different cultures of different countries. It not only reflects global competitiveness, but also supports the formation of more tolerant and adaptable individuals in an increasingly complex multicultural environment.

The younger generation that actively follows trends or cultural developments from abroad through social media cannot be freed from the formation of an understanding of the diverse cultures of other countries. As a simple illustration, when one focuses on learning English, the effectiveness of learning the language will increase with comprehensive knowledge of the English culture. This process can be seen as an attempt to instill cultural awareness and sensitivity in the context of foreign language learning [9]. Therefore, to motivate and enhance the ability of young generations, especially high school students, to understand different cultures, it is necessary to develop intercultural communication skills. (intercultural communication skills such as language skills, cultural awareness, sensitivity in the context of foreign language learning, intercultural empathy, etc.). This understanding, as an additional skill, becomes a capital for students who aspire to pursue their studies or work in culturally different regions.

It is important to acknowledge that the era of globalization has a significant impact on the world of work. In this context, many companies recognize that cross-cultural communication skills are key to facilitating effective interaction between workers from heterogeneous cultural backgrounds [2]. In addition, the phenomenon of increasing the number of individuals migrating from one country to another [5] increasingly strengthens the urgency of developing cross-cultural communication skills in the field of education.

The topics raised in this community service were in accordance with the needs of the Sabilul Rahmah International School (Sabilul Rahmah International Islamic Boarding School [Sabira-IIBS]). Located in Sumberam, Sajen, Pacet, Mojokerto, East Java, Sabira IIBS is an educational institution and school at Madrasah Aliyah (MA) level with a learning system that blends traditional Islamic values with modern learning. The curriculum used is based on national and international curricula (Al Azhar University for Diniyah and Cambridge for Mathematics, Sciences and English). The school aims to prepare the graduation to be an agent of change in accordance with the purpose of the graduation future studies. Most students are encouraged to pursue their studies to their favorite universities both national and international.



Figure 1. Students of Sabilul Rahmah Islamic Internasional Boarding School

Together with the academics of an international university partner of the University of Malaysia Perlis, the academics of the Faculty of Cultural Sciences of Universitas 17 Agustus 1945 Surabaya provided cross-cultural communication skills training as a community service activity to the students of Sabira-IIBS to develop students' understanding and to enhance their cross-culture communication skills. Cross-cultural communication skills are seen as an important aspect because, as indicated by [4], they can serve as a bridge to mutual understanding. The implication is that cross-cultural communication skills play a central role in supporting various activities in the context of everyday life. However, in reality, knowledge and skills of cross-cultural communication are still less integrated into the school curriculum in Indonesia and are generally found only at the university level as additional courses or programs. Untag Surabaya's Institute for Research and Community Service (LPPM) collaborated with Universiti Malaysia Perlis to support this international community service.

The activity method used is an Interactive Workshop, which is a practical session involving direct activities such as creating effective communication strategies in a cross-cultural context. In addition, participants are asked to share personal experiences related to cross-cultural communication, which are then analyzed together to find solutions and learning. The duration of the activity is approximately 4 hours with evaluation tools in the form of pretests and posttests. Participants involved in this activity were 20 students with class 2 MA level and a majority Javanese and Madurese cultural background.

In addition, this community service is aimed at supporting the United Nations Sustainable Development Goals (SDGs) number 4 (United Nations, n.d.), that is, quality education, especially for improving students' English language competence in receptive and productive skills through cross-cultural communication. This activity was expected to provide more opportunities for high school students in their English language communication process so that they can prepare for even higher levels. Thus, this community service can contribute to improving student English language skills through intercultural communication as well as enriching students' understanding of cross-cultural communication in partner schools.

METHOD

The implementation methods of community service through training of cross-cultural communication skills to Sabira-IIBS students are presented in Figure 2. It should be noted that this training emphasizes improved ability to communicate orally using English accompanied by responses appropriate to the context of the conversation and the implicit meaning contained in verbal and non-verbal expressions.

This community service activity was carried out at Sabilul Rahmah International Islamic Boarding School, an Islamic boarding school located in Pacet, Mojokerto. This institution focuses on international-based education with cultural diversity among students and staff. This project aims to improve intercultural communication skills, considering their globally oriented environment. This project aims to (1) develop students' cultural awareness; (2) train effective intercultural communication skills; and (3) improve students' ability to deal with intercultural situations, both in educational environments and in everyday life. The main subjects of this project are high school students of Sabilul Rahmah International Islamic Boarding School, focusing on (1) students from diverse cultural backgrounds (national and international) and (2) students who have the potential to interact in intercultural contexts in the future. Participants in this activity numbered 20 students with the subject selection technique based on teacher or mentor recommendations, where teachers or mentors recommend students who have great potential or need this training. The data collection instruments that have been carried out in this activity are in the form of questionnaires (pretest and posttest) and interviews.

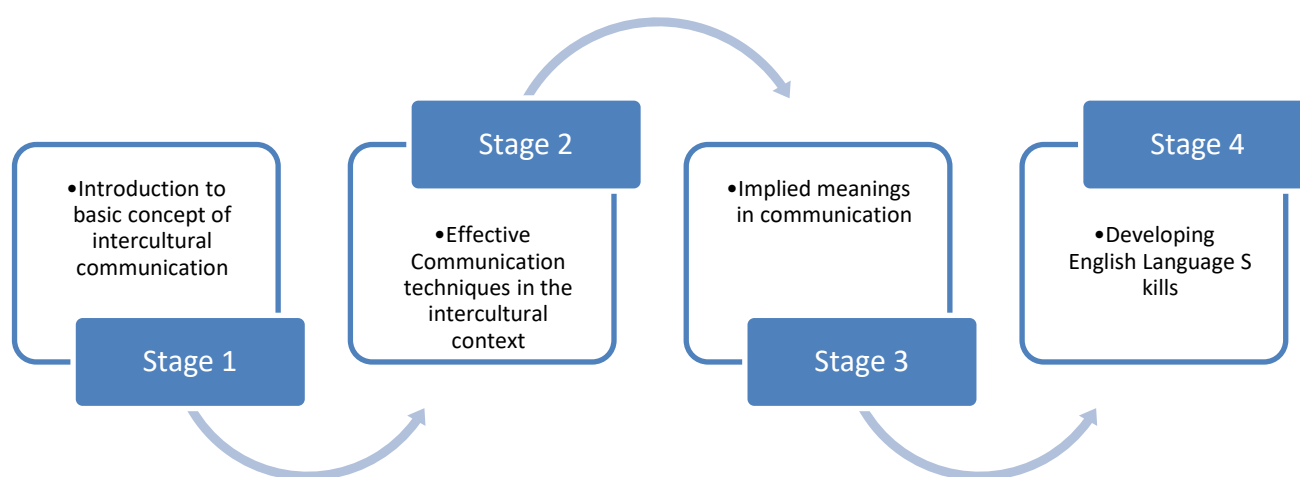


Figure 2. Stages of intercultural communication skills training for Sabira-IIBS students

In the early stages of the training, the trainers introduced the basic concepts of intercultural communication to the participants. It includes an understanding of cultural differences and how these differences can affect the way we communicate. Participants were also taught about the importance of empathy and appreciation for other cultures in intercultural communication.

The next stage is that participants are taught about effective communication techniques in intercultural contexts. This includes an understanding of how to speak, listen, and respond appropriately and effectively in various communication situations. Participants are also given practical training in communicating in various situations, such as presentations, negotiations, and everyday conversations.

The next stage of this training is the teaching of implicit meanings in communication. It includes an understanding of how verbal and non-verbal expressions can bring deeper meanings and how to interpret and respond to them properly. Participants were given plenty of opportunities to practice and develop these skills through a variety of activities and simulations. Then, this training gives an emphasis on developing English language skills. Participants are given plenty of opportunities to practice speaking in English and get direct feedback from instructors about how they communicate. It helps them to keep improving their English skills and become more confident in communicating in English.

This overall intercultural communication skills training is designed to provide participants with a deeper understanding of intercultural communication and the skills needed to communicate effectively in an intercultural context. Thus, participants can improve their ability to interact with people from different cultures and become more effective and empathic communicators.

RESULTS AND DISCUSSION

Based on data collected through observations and interviews or informal answers at the beginning of the training session, there was an average improvement in the level of Good and Excellent in understanding the concepts of intercultural communication and an average increase of 90% in oral communication skills using English. By using Bennett's Developmental Model of Intercultural Sensitivity as a scoring rubric, improved understanding and skills of participants can be shown in Table 2 below.

Tabel 2. Understanding and Intercultural Communication Skills of Participants Prior to Training

Participants		Pre-Training Session				
No	<i>Self-awareness about culture</i>	<i>Knowledge of cultural worldview framework</i>	<i>Empathy</i>	<i>Verbal and non-verbal communication</i>	<i>Curiosity</i>	<i>Attitude</i>
1	1	1	2	1	1	1
2	1	1	1	2	1	1
3	1	1	1	1	1	1
4	1	1	1	1	1	2
5	1	1	2	1	1	1
6	1	1	1	1	1	1
7	1	1	1	1	1	2
8	1	2	1	1	1	1
9	1	1	1	1	1	1
10	1	1	1	1	1	1
11	1	1	1	1	1	1
12	1	1	1	1	1	2
13	1	1	1	1	1	1
14	2	1	2	1	1	1
15	1	1	1	1	1	1
16	1	1	1	1	1	1
17	1	1	1	1	1	1
18	1	1	1	1	1	2
19	1	1	1	1	1	1
20	1	1	1	1	1	1

Notes:

1 = Poor

2 = Average

3 = Good

4 = Excellent

Table 3. Understanding and intercultural Communication Skills of Participants After Training

Participants		Post-Training Session				
No	Self-awareness about culture	Knowledge of cultural worldview framework	Empathy	Verbal and non-verbal communication	Curiosity	Attitude
1	4	4	4	3	4	3
2	4	3	4	4	4	4
3	3	4	4	4	4	4
4	4	4	4	3	4	4
5	4	4	4	4	4	4
6	4	4	4	4	3	4
7	4	3	4	4	3	4
8	4	3	3	4	3	4
9	4	4	3	3	3	4
10	4	4	4	3	3	4
11	4	3	3	4	4	4
12	4	4	3	3	3	4
13	4	3	3	4	3	3
14	4	4	4	4	4	3
15	3	3	4	4	4	4
16	4	4	4	4	3	3
17	4	4	4	4	4	4
18	4	4	4	4	4	4
19	3	4	4	4	4	4
20	4	4	4	4	4	4

Notes:

1 = Poor

2 = Average

3 = Good

4 = Excellent

4 = Baik sekali

Based on the scores in Table 2 and Table 3 above, can be seen that students' understanding of the intercultural communication material that has been delivered has increased as seen from before and after the presentation of material related to intercultural communication. The increase in students' understanding of the material presented is described through the matrix image of the results of increasing the understanding of the training participants below.

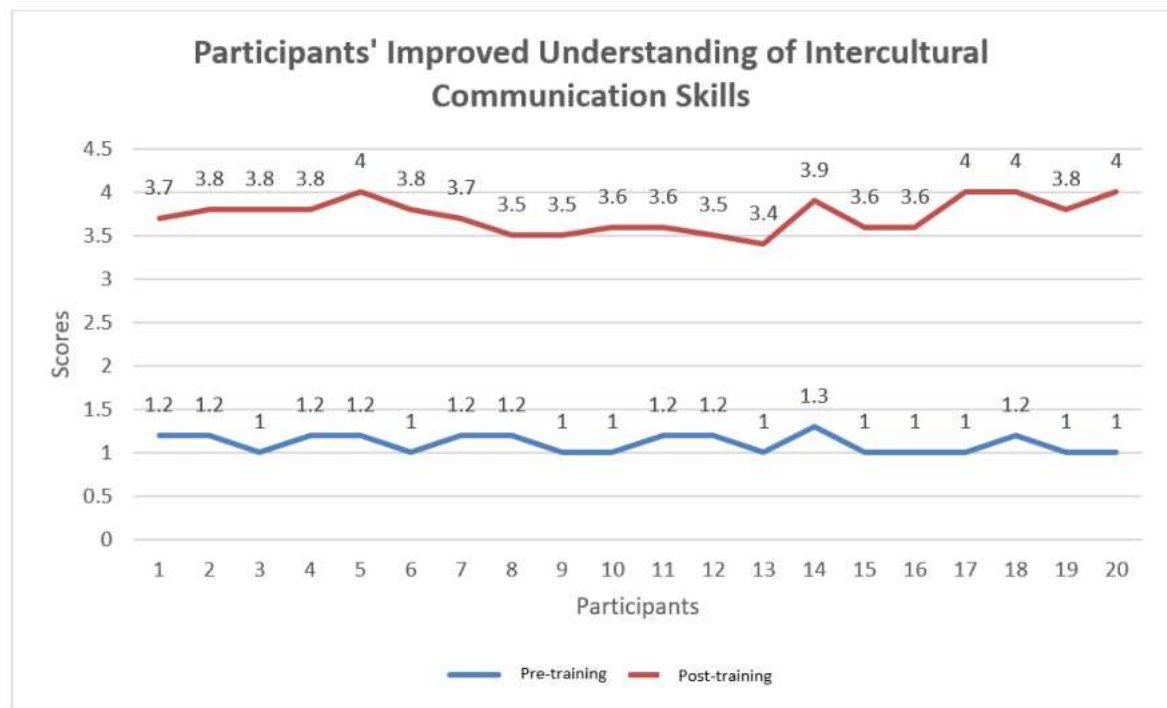


Figure 3. Matrix of Participants' Improved Understanding of the Materials Delivered

From Figure 3 above, can be seen that the average student's understanding of intercultural communication before training was at a score of 1 or 2 on a scale of 4. This means that students had limited knowledge about understanding intercultural communication skills. The average score before the implementation of the activity reached 1.11 on a scale of 4. As for after the implementation of the activity, students' understanding increased. This increase can be seen from students' answers related to understanding the material which rose to 3 and 4, which means that understanding has reached a good and excellent level. The average student understanding after the implementation of the activity reached an average of 3.73 on a scale of 4. The following is a matrix of the difference in average scores before and after the implementation of the activity.

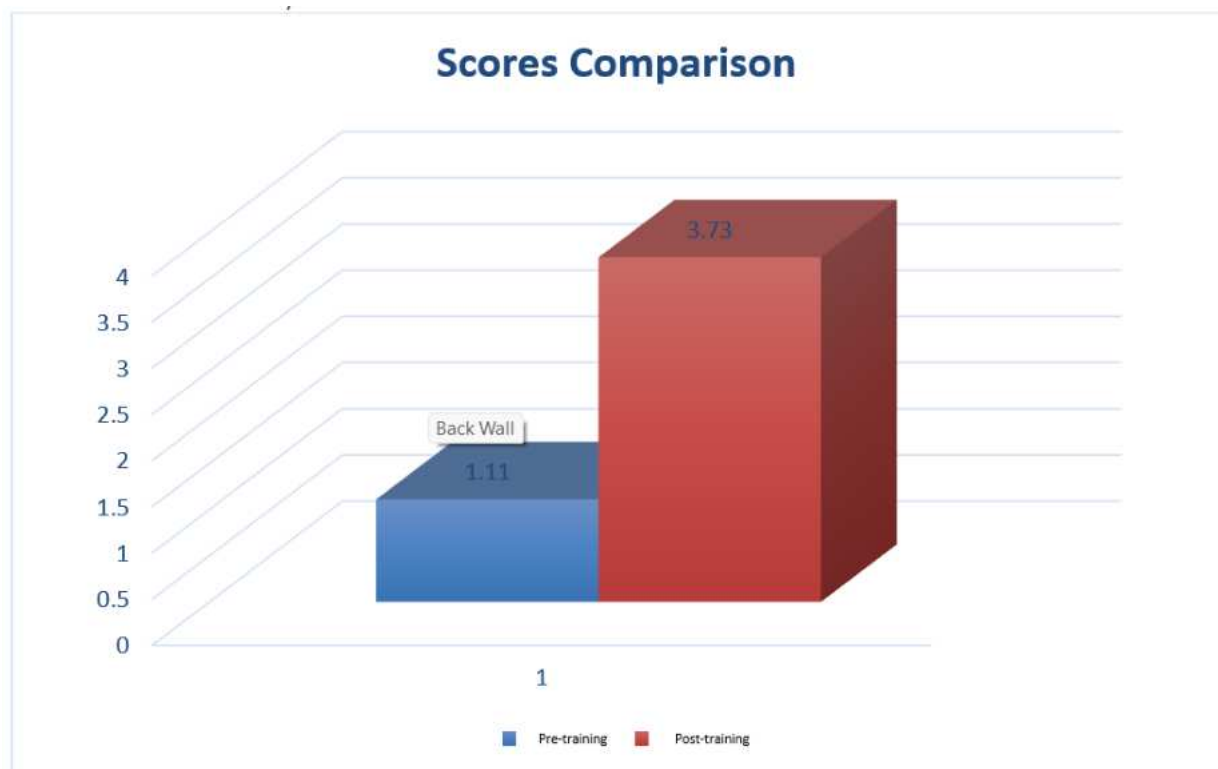


Figure 4. Matrix of Score Differences of pre- and post-training



Figure 5. Photos of Community Service Teams from Untag Surabaya and UniMAP Malaysia together with training participants



Figure 6. Speech by the head of the community service team on the activity to deliver



Figure 7. Question and Answer session, a question raised by participant



Figure 8. Responses and welcoming speech from the Head of Shabira IIBS on the activity delivered

In an increasingly globally connected world, intercultural communication skills are key to personal and professional success. Through activities like this, students can hone their ability to understand, respect and communicate with individuals from different cultural backgrounds, creating a strong foundation for a more inclusive and understanding society. This community service activity involved a series of interactive activities specifically designed to enhance the intercultural communication skills of the students. Lecturers from UniMAP also shared their personal experiences and provided insights on the importance of having effective communication skills in a multicultural environment.

Sabira-IIBS students were actively involved in practical activities, such as intercultural interaction simulations and role plays. This aims to give them hands-on experience in responding and adapting to diverse communication situations. This collaboration between Untag Surabaya and UniMAP had a significant positive impact, not only for the Sabira-IIBS students, but also for the lecturers involved. They gained valuable experience in managing community service activities, collaborating across cultural boundaries, and building networks with colleagues from different countries.

CONCLUSION

Based on the activities that have been carried out, it can be concluded that after the activity takes place there is an increase in the knowledge and understanding of activity participants related to intercultural communication from an

average understanding of 1.1 on a scale of 4 to 3.7 on a scale of 4. This indicates that the implementation of joint community service activities carried out by FIB Untag Surabaya in collaboration with UniMap Malaysia runs smoothly and can achieve the goals or targets of this activity. As a result, the implementation of this activity has a positive impact on increasing the knowledge and understanding of partners school students from this activity.

ACKNOWLEDGEMENT

The service team would like to thank the Institute for Research and Community Service of Universitas 17 Agustus 1945 Surabaya with the help of international grants resulting from collaboration between Untag Surabaya and Universiti Malaysia Perlis for their support and international funding so that this community service can be carried out well. We would also like to thank our partner, Sabilul Rahmah International School Pacet Mojokerto, for their cooperation and input so that this international community service collaboration between Untag Surabaya and Universiti Malaysia Perlis can be carried out well. Finally, we would also like to thank the members of the PMM Mitra Dosen who are students of the English and Japanese Literature Study Programs at the Faculty of Cultural Sciences, Universitas 17 Agustus 1945 Surabaya who have helped us in carrying out this international community service program.

REFERENCES

- Banks, J. A. (1974). Multicultural Education: In Search of Definitions and Goals. (J. A. Banks, Ed.). Institute on Cultural Pluralism.
- Commander, N. E., Zhao, Y., Gallagher, P. A., & You, Y. (2012). Promoting Cross-cultural Understanding of Education Through Online Discussions. *Social and Behavioral Sciences*, 46, 4632–4642. <https://doi.org/10.1016/j.SBSPRO.2012.06.310>
- Dogan, C. (2017). The Importance of Multiculturalism in Community Interpreting. *International Journal of Business, Humanity and Technology*, 7(2), 72–77.
- Eliawati, T. (2018). Cross Cultural Understanding Learning Method. *Journal MELT (Medium for English Language Teaching)*, 3(1), 17–33. <https://doi.org/10.22303/MELT.3.1.2018.14-26>
- Grishaeva, E. B. (2012). Multiculturalism as a central concept of multiethnic and polycultural society studies. *Humanities & Social Sciences*, 7, 916–922.
- Kazdin, A. E. (2000). Encyclopedia of psychology: 8 Volume set. American Psychological Association, 2, 357–359.
- Lebrón, A. (2013). What is Culture? . *Merit Research Journal of Education and Review*, 1(6), 126–132.
- Maulana, A. (2020). Cross Culture Understanding in EFL Teaching: An Analysis for Indonesia Context. *Journal of Linguistic*, 6(2), 98–107.
- Ratnasari, D. (2018). The Importance of Cross-Cultural Understanding in Foreign Language Teaching in Asian Context. *Bahasa Dan Seni: Jurnal Bahasa, Sastra, Seni, Dan Pengajarannya*, 46(2). <https://doi.org/10.17977/um015v46i22018p124>
- Rudy, Immanuel Simanjuntak, F., & Panigoro Simanjuntak, Z. (2022). Multicultural Values in Disney Animated Films. *Apollo Project*, 11(2), 97–110.
- Silviana, D., & al Musadi_Q, M. (2017). Pentingnya Pemahaman Lintas Budaya dalam Proses Negosiasi Bisnis (Studi pada Startup Bisnis Manis Clothing). *Jurnal Administrasi Bisnis*, 49(1), 44–49.
- Sood, R. (2017). Cross Cultural Communication & Effective Communication. *International Journal of Research and Scientific Innovation (IJRSI) |*, 4(12), 84–86.
- Stanley, J., Setyadi, Y., & R Rudy. (2021). The Depiction of Tolerance in American Superhero Films. *Jurnal Bahasa, Sastra Dan Studi Amerika*, 27(1), 29–49.
- United Nation. (n.d). *The 17 goals*. Retrieved October 30, 2023, from <https://sdgs.un.org/goals.at.13.29>
- Yilmaz, F. (2018). Road to peace education: Peace and violence from the viewpoint of children. *International Education Studies*, 11(8), 141–152. <https://doi.org/10.5539/ies.v11n8p141>



Trainings to improve students' understanding in *fiqh of muamalah*, English, and Arabic at Muhammadiyah Islamic Boarding School, Ponorogo

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ARTICLE INFO	ABSTRACT
Article history Received: 2025-01-18 Revised: 2025-04-03 Accepted: 2025-04-21 Published: 2025-04-30 Keywords Arabic English Fiqh of Muamalah Teaching Program Kata Kunci Bahasa Arab Bahasa Inggris Fiqh muamalah Program mengajar	<i>This training is designed to enhance the understanding of students regarding the Fiqh of Muamalah and to improve their English and Arabic language skills. The Fiqh of Muamalah curriculum covers fundamental principles of interaction and transactions according to Islamic law, aiming to equip students with the ability to understand, analyze, and apply fiqh principles in daily life contexts. The English and Arabic language enhancement program is intended to strengthen students' communication skills in foreign languages, which serve as essential assets for facing global challenges. The teaching methods include interactive lectures, group discussions, practical muamalah simulations, and intensive language practice through dialogues and presentations. This program is expected to produce students who are not only proficient in understanding the Fiqh of Muamalah but also competent in English and Arabic, preparing them to be an outstanding generation in religious knowledge and language skills in the globalization era.</i> Pelatihan peningkatan pemahaman siswa dalam fiqh muamalah, bahasa Inggris, dan bahasa Arab di Pondok Pesantren Muhammadiyah Ponorogo. Program mengajar ini dirancang untuk meningkatkan pemahaman santri di Pondok Pesantren Muhammadiyah Boarding School Ponorogo mengenai Fiqh Muamalah serta keterampilan bahasa Inggris dan Arab. Materi Fiqh Muamalah mencakup prinsip-prinsip dasar dalam berinteraksi dan bermuamalah sesuai syariat Islam, dengan tujuan membekali santri kemampuan untuk memahami, menganalisis, dan menerapkan kaidah fiqh dalam konteks kehidupan sehari-hari. Program peningkatan bahasa Inggris dan Arab ditujukan untuk memperkuat keterampilan komunikasi santri dalam bahasa asing, yang menjadi modal penting dalam menghadapi tantangan global. Metode pengajaran meliputi ceramah interaktif, diskusi kelompok, simulasi praktik muamalah, serta latihan intensif bahasa melalui dialog dan presentasi. Program ini diharapkan dapat menghasilkan santri yang tidak hanya mahir dalam pemahaman fiqh muamalah, tetapi juga kompeten dalam berbahasa Inggris dan Arab, sehingga siap menjadi generasi yang unggul dalam penguasaan ilmu agama dan keterampilan bahasa di era globalisasi. Copyright © 2025, Nidzom, et al This is an open access article under the CC-BY-SA license 
How to cite: Nidzom, M.F., Shalahuddin, H., Nasution, A.F., Saputra, A., Syurbakti, A.P., Amrullah, A., Muhammad, A., Rizky, A.U., Abdullah, F.M., Fauzi, F.A., Zaim, M.A.A., Kamil, R.F., & Oktavianos, V. (2025). Trainings to improve students' understanding in fiqh of muamalah, English, and Arabic at Muhammadiyah Islamic Boarding School, Ponorogo. <i>Journal of Community Service and Empowerment</i>, 6(1), 243-251. https://doi.org/10.22219/jcse.v6i1.39431	

INTRODUCTION

Boarding School (boarding school) is a type of educational institution where students not only study at school but also live in dormitories provided by the school. In boarding schools, students live away from home and live their daily lives in the school environment, including studying, worshiping, and participating in various activities outside of class hours. The boarding school concept is usually applied in various types of education, from elementary school to university level. (Reskiawan & Agustang, 2021)

These boarding schools usually have a very structured schedule, where students will follow a routine that includes time for studying, worship, sports, extracurricular activities, as well as time for rest. Boarding schools can be found in various educational models, including religious, international or national education, with the main aim of creating an educational environment that supports the development of character, social skills and discipline. (Budimansyah & Komalasari, 2019) Specialized boarding schools learning Muamalah Fiqh, Arabic and English is an educational institution that combines Islamic religious education with international language skills, in an effort to prepare students to face global challenges without abandoning their identity and religious values. This type of boarding school provides a balance between teaching religious knowledge, especially fiqh muamalah (Islamic law relating to social and economic interactions), as well as languages used internationally in the modern world.

Muamalah fiqh is a collection of laws that are prescribed by certain methods and procedures by competent people which regulate relations between the interests of human beings. These rules relate to the relationship between existence and economic issues, namely: trade, borrowing and borrowing, renting, trading cooperation, storing goods or money, inventions, wages, receivables, levies, inheritance, wills, living, goods entrusted or ordered, etc. So teaching muamalah fiqh is very important to provide students with an understanding of what objects are appropriate or not to own, and to provide guidance in carrying out legal action regarding an object (istihak, 2018).

Then language improvement education is given to Muhammadiyah boarding school students to provide them with an understanding of Arabic and English that learning Arabic and English is easy and fun. The Arabic and English language education provided in the learning process aims to enable students to read, understand, write and speak using Arabic and English. Because Arabic and English are one of the main languages used in the world, especially Arabic which is widely used in Islamic religious learning because the Qur'an is written in Arabic. And strive so that every Muhammadiyah boarding school student can understand and also communicate using two languages at once and can apply it in everyday life. (Wardani et al., 2019) Therefore, as an effort to introduce the learning of muamalah fiqh and increase understanding of Arabic and English to Muhammadiyah boarding school students, the author will provide a community service activity in the form of a learning program: through introduction and understanding of muamalah jurisprudence and how to read, understand, speak and write effectively. good and correct Arabic and English. Apart from that, the author also hopes that Muhammadiyah boarding school students can apply the learning of muamalah fiqh, Arabic and English in their daily activities.

This activity will be carried out by providing lessons on "Muamalah Fiqh and Language Improvement to Muhammadiyah Boarding School Students" where they will hold exams and accompany the students to provide teaching on the points above. Then, the supervisor will hold an exam and practice. At the end of this activity, the author will review what has been taught, give appreciation in the form of prizes to students who get high marks and are enthusiastic about learning. (Yuliyanti et al., 2022) The current condition of Muhammadiyah boarding school students is that there is still no introduction to learning related to muamalah fiqh and improving their language skills. Therefore, there is a need for introduction and understanding related to muamalah fiqh and language improvement so that Muhammadiyah boarding school students gain knowledge and also comprehensive learning with matters related to understanding muamalah fiqh including things contained in it and education to improve the Arabic language. and English so that students apply it more often in their daily activities. Therefore, it is important to immediately provide interesting learning by presenting an introduction and understanding of muamalah fiqh and education to improve Arabic and English to Muhammadiyah boarding school students so that they are more confident and confident in practicing fiqh and speaking the language well and correctly.

The aim of this community service activity is to provide a solution that is appropriate to the problems that occur and are identified. Namely a lack of understanding of muamalah fiqh and language improvement for Muhammadiyah boarding school students. By holding this activity the author aims to provide intensive understanding and learning about muamalah fiqh with material such as explanations about shodaqoh, gifts and the law of usury. and improving language through conveying mufrodhat and placing it in a sentence, carrying out dialogue, writing insha and providing meaning in a story in learning Arabic and English. Thus, in connection with this community service, it is hoped that Muhammadiyah boarding school students will gain knowledge and apply it in their daily lives in the dormitory or outside the dormitory (Telaumbanua et al., 2022). Also, this project supports the SDGs program number 4.

METHOD

This Community Service Program activity was carried out at the Muhammadiyah Boarding School. MBS's address is located at Jl. General Sudirman No. 72 District. Jetis, Ponorogo Regency, East Java Participants in this activity were students from grades one to six at the Muhammadiyah Boarding School. The place used for this service is the Men's & Women's Campus 1. The implementation date is 17 July to 3 September 2024. This community service is carried out using a PAR (Participatory Action Research) approach through partnerships between teachers and students in planning and implementing mutually agreed activity programs (Fitrah & Luthfiyah, 2017) (Figure 1).

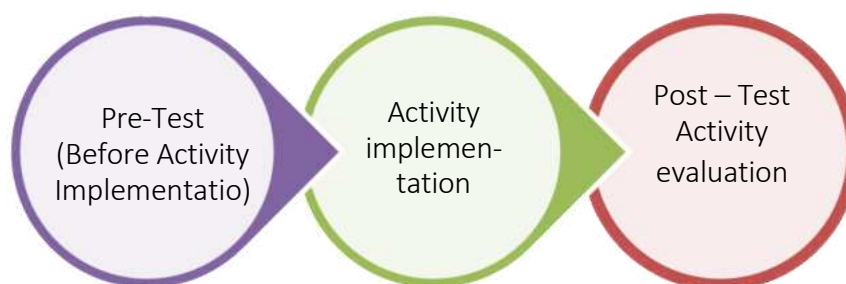


Figure 1. Stages of the Community Service Program

Pre-Test

The pre-implementation of the activities carried out were:

- 1) Determining Pre-test Objectives: To determine students' ability to understand muamalah fiqh, English and Arabic
- 2) Preparing Pre-test Material: Fiqh Muamalah, English, and Arabic
- 3) Implementation of the Initial Briefing Pre-test: Before the test begins, give students a brief direction regarding the purpose of the pre-test and how to take it. Then explain that this test is used to determine the starting point of their abilities in the fields of jurisprudence, English and Arabic, as well as to design more effective programs.
- 4) Giving feedback to participants regarding pre-test results
- 5) Creating community service activity schedule.
- 6) Preparing tools for events in community service activities and setting up tents.

Activity Implementation

The implementation phase of the activities carried out was shown in Table 1.

Table 1. Schedule of Activity Implementation

Day and date	Activities	Time
13 June 2024	Introduction about the PKM program	1 week
15 June 2024	Determining Partners	1 week
17 June 2024	Drafting a PKM proposal	1 week
19 June 2024	Submit a permit letter to the partner	08.00 – 12.00
21 June 2024	Determine PKM material	18.00 – 20.00
25 June 2024	Organize a question-making group	18.00 – 20.00
30 June 2024	Collecting Muamalah Fiqh questions	07.00 – 22.00
1 July 2024	Collecting English and Arabic questions	07.00 – 22.00
17 July 2024	Meeting 1 (Holding a Pretest)	19.30 – 21.30
29 July 2024	Meeting 2 (Teaching Muamalah Fiqh learning)	19.30 – 21.30
August 11, 2024	Meeting 3 (English Learning)	19.30 – 21.30
August 25, 2024	Meeting 4 (Arabic Language Learning)	19.30 – 21.30
August 31, 2024	Meeting 5 (Conducting a Posttest Exam)	19.30 – 21.30
3 September	Closing Community Service	19.30 – 21.30
5 September 2024	Reporting PKM results	1 week

Activity Evaluation

The evaluation phase is divided into two parts (Y, 2020). First, evaluate the results of increasing intellectual intelligence with a post-test for Community Service participants. Second, evaluate the results of the Community Service activities of the committee consisting of the community service team of postgraduate students from the UNIDA Gontor Men's Campus and MI Nurussalam teachers and students. Intellectual intelligence involves a deep understanding of oneself, life goals, values, and connection to the higher or inner self. The questions asked can help detect and explore the intellectual intelligence of Muhamadiyah Boarding School students in the activities they participate in, namely Community Service. This activity opens up space for self-reflection and helps someone explore the dimensions of their intellectual intelligence. Intellectual Intelligence is a highly personal experience and understanding, therefore, the questions are designed to stimulate deep reflection. In addition, after evaluating the activities, several supporting criticisms and suggestions were obtained so that they could become lessons for following up on PERSAMI activities in the future. Existing goodness will be maintained and if there are some mistakes, they will be corrected in order to provide valuable experience and lessons.

RESULTS AND DISCUSSION

Overall, all planned events ran smoothly and successfully. A meeting with the community service team was held together with the management of the Muhamaddiyah Boarding School, namely the head of the Foundation, to start the Community Service Program. In the inaugural meeting, it was agreed to organize Community Service activities to increase students' intellectual intelligence outside of Islamic religious learning sessions. This program aims to increase students' intelligence by expanding Islamic religious and language education outside the classroom through this service. So far, schools have taught Islamic religious material in class without knowing how to apply the learning results. For example, schools do not yet know how much students want to study fiqh muamalah, English and other languages in groups outside school hours.

Another simple example is the number of languages that are remembered and how they are applied in everyday life. Therefore, this activity helps schools increase students' intellectual intelligence through fun outdoor activities. There are two types of activities, namely main activities and supporting activities. Teaching is the main activity, while Liqo Mufrodat, performing arts, Futsal, and post-test are supporting activities. As the main activities, Pre-Test, teaching muamalah fiqh, English and Arabic aims to build several Islamic boarding schools that can accommodate student learning activities for 24 hours outside the classroom (Figure 2). The teaching environment is designed with a fun approach. Therefore, the teaching design is very suitable for middle and high school students. The service activities participated in by all Muhamaddiyah Boarding School students are divided into 10 plots. Each plot is developed for Fiqh Muamalah, English and Arabic. Meanwhile, this program also aims to increase Intellectual Intelligence in the fields of fiqh and language.

The first supporting activity is Liqo Mufrodat. Liqo mufrodat in Community Service activities consists of Arabic and English (Figure 3). Liqo Mufrodat aims to focus on learning vocabulary, both in Arabic and English, which is relevant to religious and social contexts. (Audina et al., 2022). Improve students' ability to master Arabic or English vocabulary related to religious material, especially in the fields of muamalah fiqh, worship and morals. By mastering good vocabulary, students can more easily understand and apply religious teachings in everyday life (Amin, 2018). It is hoped that the community service activities carried out at Muhammadiyah Boarding School Jetis will have a significant impact on both students, the community and the parties involved in this program.

Figure 2. Pre Test



Figure 3. Liqo Mufrodat

The liqo mufrodat activity is one of the supporting activities which aims to improve students' ability to understand and master Arabic vocabulary. This activity is very important to instill enthusiasm for learning Arabic in a fun and interactive way (Ulum, 2022). Through liqo mufrodat, students can expand their vocabulary, which is not only beneficial in language learning, but also in strengthening their understanding of concepts. religious concepts conveyed in Arabic. By understanding mufrodat in depth, students can more easily access religious texts, both the Koran and Hadith, which mostly use Arabic. Therefore, liqo mufrodat is an effective means of instilling an understanding of Arabic as part of increasing their language intelligence and spirituality, which in turn can deepen their love of science and religion. Apart from that, through liqo mufrodat, students are also trained to communicate well in Arabic, which is very useful in everyday life and in understanding more deeply the teachings of Islam.



Figure 4. Muamalah Fiqh Teaching

Teaching Muamalah Fiqh is also an important supporting activity in the education program at Muhammadiyah Boarding School. Muamalah Fiqh is a branch of fiqh that discusses Islamic laws related to social interactions and transactions between individuals, whether in terms of trade, agreements, or other economic relations. Fiqh Muamalah teaching activities aim to provide a deep understanding of how to interact with other people based on Islamic principles of fairness, honesty and transparency. (Suryanto & Abdullah, 2023) This activity is carried out in the form of study and discussion, which involves students to understand various aspects of Islamic law related to muamalah, such as buying and selling, lending and borrowing, renting, and various other forms of transactions. Teaching Muamalah Fiqh also teaches students to avoid practices that are prohibited in Islam, such as usury, gharar (uncertainty), and fraud, and emphasizes the importance of honesty and fairness in every transaction.

Teaching Arabic and English in Community Service Programs In the community service program at Muhammadiyah Boarding School, teaching Arabic and English is one of the main focuses. (Muhtarom, 2023) This activity aims to improve participants' language skills in both languages, which is very It is important to support religious understanding and broaden global horizons. Through interactive methods, participants are taught various vocabulary, grammar and applicable communication skills. Arabic language teaching is focused on mastering basic vocabulary, grammar, and the ability to read and understand religious texts. Meanwhile, English language teaching places more emphasis on speaking and writing skills, with the aim of preparing participants to be able to compete at the international level. It is hoped that these two languages will open up opportunities for participants to develop academically and professionally in the future.



Figure 5. English and Arabic Language Teaching

Futsal as a community service program at the Muhammadiyah Boarding School is a form of activity that aims to develop physical skills, teamwork and a spirit of sportsmanship among students. This futsal activity not only aims to improve physical fitness, but also to teach positive values such as discipline, responsibility and mutual respect among the participants. In this community service program, futsal is used as a medium to build a sense of togetherness among students and between the school and the surrounding community. Through futsal matches, students are expected to develop technical skills in playing mini football, as well as strengthen the spirit of teamwork which is very important in social and academic life. (Figure 6)

After a series of community service activities at Muhammadiyah Boarding School, **post-test** carried out to evaluate the extent to which participants have absorbed and applied the knowledge taught. This post-test aims to measure changes in participants' understanding, skills and attitudes regarding the material that has been given, such as fiqh muamalah, Arabic and English, as well as other activities such as futsal. The post-test results will provide an overview of the program's effectiveness and become a basis for program improvements in the future. At stage **closing**, the community service team expressed its appreciation to all parties involved, including participants, teachers and those who supported this activity. This closing is also an opportunity to reflect on the program's achievements and ensure that the knowledge and skills gained can be applied in everyday life. It is hoped that this program will have a long-term positive impact, strengthen the relationship between the school and the community, and be the first step for future community service programs (Figure 8).



Figure 6. Futsal Match



Figure 7. Post Test



Figure 7. Closing

An integral part of Community Service activities is evaluation, which aims to measure the results of the training that has been carried out in teaching Arabic, English and muamalah fiqh (Agustianti et al., 2022). Evaluation is carried out through a post-test in the form of a practical exam to assess participants' understanding and skills after participating in learning activities (Ricci et al., 2019). Looking at the participants' post-test results, it can be seen that there is a significant influence in increasing language competence and understanding of muamalah fiqh. This improvement can be seen from the participants' skills in speaking and writing in Arabic and English, as well as their better understanding of the concepts of muamalah fiqh. Apart from that, participants also showed an increase in the practice of daily prayers and the application of religious teachings in daily life. They become more aware of the procedures for social interaction in accordance with the principles of muamalah fiqh, such as fair transactions, honesty and correct business ethics.

The success of this Community Service method can be measured from a number of factors that involve active participation and a positive impact on participants' understanding of language and fiqh. This success can also be seen from the increased awareness of participants to apply the knowledge they learn in their daily lives. With regular evaluations and continuous learning, this program can ensure that the results achieved are in line with the desired goals, and have a positive impact on participants in the long term.

CONCLUSION

The community service program has added a new dimension to the Muhammadiyah Boarding School's efforts to enrich religious education. Efforts to integrate activities in the classroom and educate Islam outside the classroom show significant innovation. Students' enthusiasm for understanding Islamic religious themes and spiritual intelligence increases thanks to this innovation, which is very good for instilling a sense of worship. As a result, from an early age, students are instilled with the understanding that worship is more than just a ritual. Several efforts have been made to ensure the continuity of the community service program, including making it a mandatory annual activity at the Muhammadiyah Boarding School. Based on the success of this program in increasing students' spiritual intelligence in the fields of fiqh, Arabic and English and generating enthusiasm for understanding the Islamic religion, this program is worthy of being used as a model for Muhammadiyah Boarding Schools and other similar educational institutions.

The quality of Islamic religious education has a very important role in shaping the character and morals of Muslim individuals, understanding Islamic values, and providing a solid spiritual foundation. Quality Islamic religious education plays a major role in forming individuals with good character, responsibility and spiritual awareness. This religious education provides a strong moral and ethical foundation for everyday life as well as a positive contribution to society and the world at large. Quality education helps shape students' character and morals. The moral and ethical values taught in schools help develop good attitudes and behavior.

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REFERENCES

- Abidin, A. M. (2019). Pengaruh penerapan kegiatan keagamaan di lembaga pendidikan formal terhadap peningkatan kecerdasan spiritual anak. *An-Nisa: Jurnal Studi Anak Dan Gender*, 12(1), 570–582. <https://doi.org/10.30863/annisa.v12i1.452>
- Afdal, A., & Widodo, H. (2020). Analisis pelaksanaan kegiatan Pramuka di SD Negeri 004 Samarinda Utara tahun 2019. *Pendas Mahakam: Jurnal Pendidikan Dasar*, 4(2), 68–81. <https://doi.org/10.24903/pm.v4i2.399>
- Agustianti, R., Nussifera, L., Angelianawati, L., Meliana, I., Sidik, E. A., Nurlaila, Q., Simarmata, N., Himawan, I. S., Pawan, E., & Ikhrum, F. (2022). *Metode penelitian kuantitatif dan kualitatif*. Tohar Media.
- Amin, A. (2018). Konsep ukhuwwah Islamiyyah sebagai materi PAI. *Ta'dibuna: Jurnal Pendidikan Islam*, 1(1), 29–39.
- Amirrudin, T., Saepuddin, A., & Tsauri, A. M. (2017). Implikasi pendidikan dalam QS Faathir Ayat 32 tentang makna sabiqun bil khairat terhadap kepribadian muslim. *Prosiding Pendidikan Agama Islam*, 3(1), 93–97.
- Anindyarini, A., & Wijayanti, K. D. (2019). Penerapan metode perlombaan tim dengan media permainan kebenaran dan tantangan untuk meningkatkan kemampuan menelaah teks eksposisi pada siswa SMA. *Pedagogia: Jurnal Penelitian Pendidikan*, 22(2). <https://doi.org/10.20961/paedagogia.v22i2>
- Anjarsari, R., Syahidin, S., & Sumarna, E. (2017). Program gerakan cinta Alquran “genta” dalam mengoptimalkan pendidikan agama Islam di sekolah (Studi deskriptif di SMP Unggulan Al-Amin Ngamprah). *Tarbawy: Indonesian Journal of Islamic Education*, 4(1), 57. <https://doi.org/10.17509/t.v4i1.6992>
- Audina, D., Soleh, D. A., & Sumantri, M. S. (2022). Pendidikan karakter cinta tanah air dan kedisiplinan dalam kegiatan upacara bendera di sekolah dasar DKI Jakarta. *EduStream: Jurnal Pendidikan Dasar*, 5(1), 60–68. <https://doi.org/10.26740/eds.v5n1.p60-68>
- Erliani, S. (2017). Peran gerakan Pramuka untuk membentuk karakter kepedulian sosial dan kemandirian (Studi Kasus di SDIT Ukhwah dan MIS An-Nuriyyah 2 Banjarmasin). *Jurnal Ilmiah Pendidikan Guru Madrasah Ibtidaiyah*, VII(1), 36–52.
- Fitrah, M., & Luthfiah, L. (2017). *Metodologi penelitian: Penelitian kualitatif, tindakan kelas & studi kasus*. CV Jejak.
- Hasanah, M. (2021). *Landasan Pendidikan Islam*. CV. Kanhayakarya.
- Herawati, H. (2020). Memahami proses belajar anak. *Bunayya: Jurnal Pendidikan Anak*, 4(1), 27–48. Herwani.
- (2020). Ukhwah Islamiyah dalam pandangan Al-Qur'an. *Cross-Border*, 3(2), 294–301.
- Ismail, M. I., & Hasan, A. H. (2022). Implementasi standar proses pada mata pelajaran pendidikan agama Islam di sekolah dasar swasta terpadu Bani Rauf Kabupaten Gowa. *Inspiratif Pendidikan*, 11(1), 85–100.

- Jamhuri, M. (2017). Kurikulum PAI multikultural dalam proses pembelajaran prespektif al Qur'an. *Mafhum*, 2(2), 185– 308.
- Juwantara, R. A. (2019). Efektivitas ekstrakurikuler pramuka dalam menanamkan karakter jujur disiplin dan bertanggung jawab pada siswa madrasah ibtidaiyah. *Premiere Educandum: Jurnal Pendidikan Dasar Dan Pembelajaran*, 9(2), 160. <https://doi.org/10.25273/pe.v9i2.4994>
- Johansyah, J. (2017). Pendidikan karakter dalam Islam: Kajian dari aspek metodologis. *Jurnal Ilmiah Islam Futura*, 11(1), 85–103.
- Lestari, S. D., & Maunah, B. (2022). Dasar-dasar yuridis sistem pendidikan nasional. *Jurnal Ilmu Pendidikan Sekolah Dasar*, 9(3), 193–204.
- Magdalena, I., Nurul Annisa, M., Ragin, G., & Ishaq, A. R. (2021). Analisis penggunaan teknik pre-test dan post-test pada mata pelajaran matematika dalam keberhasilan evaluasi pembelajaran di SDN Bojong 04. *Jurnal Pendidikan Dan Ilmu Sosial*, 3(2), 150–165.
- Nurfatimah, S. A., Hasna, S., & Rostika, D. (2022). Membangun kualitas pendidikan di Indonesia dalam mewujudkan program sustainable development goals (SDGs). *Jurnal Basicedu*, 6(4). <https://doi.org/10.31004/basicedu.v6i4.3183>
- Nurmiati, N. (2021). *Implementasi kurikulum PAI di sekolah dasar*. PT. Nasya Expanding Management.
- Prihatmojo, A., & Badawi, B. (2020). Pendidikan karakter di sekolah dasar mencegah degradasi moral di era 4.0. *DWIJA CENDEKIA: Jurnal Riset Pedagogik*, 4(1), 142–152. <https://doi.org/10.20961/jdc.v4i1.41129>
- Puspaningrum, Y., Zuhria, S. A., Sulton, M., & Baharudin, M. (2021). Upaya peningkatan kreativitas dan karakter anak islami melalui lomba kreasi santri di TPQ Al Muttaqin Desa Kayen. *Informatika: Jurnal Pengabdian Masyarakat*, 2(2), 83–86.
- Putra, A. D. (2016). Indahny kebersamaan dengan shalat berjama'ah. *Tafsere: Jurnal UIN Alauddin Makassar*, 4(1), 165–175.
- Putri, H. (2023). Pentingnya motivasi dan pengalaman mahasiswa dalam mengikuti lomba MTQ Nasional Gebyar Qur'ani. *Nautical : Jurnal Ilmiah Multidisiplin*, 1(10), 1098–1103.
- Qolbiyah, A., Mansur, A., & Bakar, A. (2022). Inovasi dan modernisasi kurikulum dalam pembelajaran pendidikan agama Islam. *Jurnal Penelitian Ilmu Pendidikan Indonesia*, 1(2), 301–309.
- Rauhah, L., Ngulwiyah, I., & Nurahman, I. (2021). Implementasi kompetensi kepribadian guru dalam penguatan karakter religius peserta didik melalui pembiasaan di kelas IV MIN 2 Serang. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, 10(6), 1643–1653.
- Ricci, L., Lanfranchi, J. B., Lemetayer, F., Rotonda, C., Guillemine, F., Coste, J., & Spitz, E. (2019). qualitative methods used to generate questionnaire items: A systematic review. *Qualitative Health Research*. <https://doi.org/10.1177/1049732318783186>
- Rusli, R. (2021). Pengaruh teknologi terhadap dekadensi moral anak. *SYATTAR*, 2(1), 63–76.
- Sa'diyah, T. (2022). Penerapan pembelajaran pendidikan agama Islam dalam membentuk karakter pribadi yang Islami. *KASTA: Jurnal Ilmu Sosial, Hukum, Agama, Budaya Dan Terapan*, 2(3), 148–159.
- Saepudin, A., Setiawati, A. F., & Qoyim, N. (2022). Pengabdian mahasiswa di masyarakat terpencil (Studi PAR di Cigarukgak, Desa Sukatani, Kecamatan Sukatani, Kabupaten Purwakarta). *ADINDAMAS: Jurnal Pengabdian Kepada Masyarakat*, 1(2), 128–139. <https://doi.org/10.37726/adindamas.v1i2.323>
- Susetyo, A. M. (2016). Pelatihan membaca Al-Qur'an yang BAIK. *Jurnal Pengabdian Masyarakat Ipteks*, 2(1), 34–42.
- Taubah, M., & Chasanah, U. (2018). Peranan gerakan Pramuka dalam menanamkan sikap nasionalisme di madrasah ibtidaiyah (Studi kasus Di MIN Kudus Tahun Pelajaran 2017/2018). *Elementary: Islamic Teacher Journal*, 6(2), 337–354.
- Yuliyanti, Y., Damayanti, E., & Nulhakim, L. (2022). Perkembangan kurikulum sekolah dasar di Indonesia dan perbedaan dengan kurikulum di beberapa negara. *Lingua Rima: Jurnal Pendidikan Bahasa dan Sastra Indonesia*, 11(3), 95– 106.
- Yusanto, Y. (2020). Ragam pendekatan penelitian kualitatif. *Journal of Scientific Communication (jsc)*, 1(1), 1–13. <https://doi.org/10.31506/jsc.v1i1.7764>
- Yusrie, C. S., Noviansyah, I., & Nasrudin, M. (2021). Minat remaja dalam mengikuti shalat berjamaah. *Mimbar Kampus: Jurnal Pendidikan Dan Agama Islam*, 20(1), 1–12. <https://doi.org/10.47467/mk.v20i1.437>
- Zarkasyi, H. F. (2020). *Minhaj berislam, dari ritual hingga intelektual*. Institut for The Study of Islam Thought and Civilizations (INSISTS)

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Assisting 10-week CLIL enrichment program for Islamic-affiliated primary school students

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ARTICLE INFO	ABSTRACT
Article history Received: 2023-11-04 Revised: 2024-01-17 Accepted: 2024-01-20 Published: 2024-01-25 Keywords CLIL EYL Enrichment program Islamic-affiliated primary school	Teaching English to Young Learners starts to reach its growth as parents want their children to be competent in one of the 21st century skills, it is being communicative. Having the ability to communicate in one foreign language, particularly English, is considered important for many parents whose children study at Islamic-affiliated schools, other than Arabic skill. However, English teaching at primary school level is still limited in terms of its teaching duration, they learn only for 90 minutes per week. Therefore, this community service aims at providing more opportunities for primary graders at SD Aisyiyah Kota Malang to learn English through Content Language Integrated Learning (CLIL) enrichment program which was done on weekend class that lasted for ten consecutive meetings. The program was conducted in as semester, starting from July up to December 2023. Further, the methods implemented were analyzing students' learning needs, designing science-based topics as teaching material, developing materials, implementing the learning design through 10-week teaching, and evaluating the program. Results show that the content of the subject at the school was taught in English. Some materials designed for this project were about science, thus, in this program students discussed the topic of science in English. Also, the content was designed by integrating Islamic elements, the topics were animals mentioned in the Quran such as camel, whale, bird, donkey, and crow. At the end of the session, this activity has gained a positive response from students, content teacher, homeroom teacher, and also the school principal. This indicates that the community service which was designed in the form of the enrichment program for weekend class was effectively run.
Kata Kunci CLIL Pengajaran bahasa Inggris untuk anak-anak Program pengayaan Sekolah Dasar Islam	Program pengayaan CLIL selama 10 pekan bagi siswa sekolah dasar Islam. Pengajaran Bahasa Inggris untuk anak-anak mulai mencapai pertumbuhannya karena orang tua ingin anak-anak mereka kompeten dalam salah satu keterampilan abad ke-21, yaitu keterampilan komunikatif. Kemampuan berkomunikasi dalam satu bahasa asing, khususnya bahasa Inggris, dianggap penting bagi banyak orang tua yang anaknya bersekolah di sekolah Islam, selain kemampuan bahasa Arab. Namun pengajaran bahasa Inggris di tingkat sekolah dasar masih terbatas dalam hal durasi pengajarannya, mereka hanya belajar selama 90 menit per minggu. Oleh karena itu, pengabdian pada masyarakat ini bertujuan untuk memberikan kesempatan lebih luas kepada siswa kelas SD SD Aisyiyah Kota Malang untuk belajar bahasa Inggris melalui program pengayaan Content Language Integrated Learning (CLIL) yang dilakukan pada kelas akhir pekan yang berlangsung selama sepuluh pertemuan berturut-turut. Kegiatan program pengabdian ini diselenggarakan selama satu semester dari Bulan Juli 2023 sampai Desember 2023. Terlebih, Metode yang dilakukan adalah menganalisis kebutuhan belajar siswa, merancang topik berbasis sains sebagai bahan ajar, mengembangkan materi, melaksanakan desain pembelajaran melalui pengajaran 10 minggu, dan mengevaluasi program. Hasil menunjukkan bahwa konten atau mata pelajaran di sekolah diajarkan dalam bahasa Inggris. Di akhir sesi, kegiatan ini mendapat respon positif dari siswa, guru materi, dan wali kelas, serta kepala sekolah. Hal ini merupakan indikasi bahwa pengabdian masyarakat yang merancang program pengayaan kelas akhir pekan berjalan efektif.

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INTRODUCTION

Teaching English since early age has been done by many researchers. However, little attention is put on how it is integrated to other subjects such as science. Teaching English through science can build young learners' communicative competences—the competence about the knowledge and the context of a language is operated. In such notion, the concept of Content and Language Integrated Learning (CLIL) can be a way to support the belief that young learners will successfully learn a second language (Coyle, 2015; Dalton-Puffer et al., 2021; Farah & Khoiriyah, 2023; Marsh & Langé 2000). Even though there is a debate whether or not a second language is appropriately taught to young learners, numerous research results reveal that at least a great attainment on language learning is proven to be successful in young learners in the aspect of pronunciation and grammar compared to their counterpart, adult language learners (Ellis, 2008; Heras & Lasagabaster, 2015; Nugroho, 2020; Xanthou, 2011).

In a similar vein, teaching English to young learners can also be a medium for intercultural communicative competence. Mattson and Norrby (2013) assert that student will gain greater achievement on intercultural communicative competence when enough time is allocated to produce the target language in a communicative context. In this case, teachers in Islamic school context can enrich their students with materials that support the discourse used in that school, i.e. Islamic cultures and values. If happens other cultures are infused in the teaching process, the curriculum must be planned very carefully (Byram, 2008; Liao & Li, 2023; Torres-Velasquez et al., 2023). Thus, the idea of integrating science with Islamic content is highly suggested.

This effort supports the implementation of Culturally Responsive Teaching (CRT) that in teaching English, teachers cannot impose the idea of teaching the culture of the center (Western) but they also need to take a serious concern on learners' background and school context. In its implementation, the work of Gay (2018), Gay (2015), and Ladson-Billing (2009) view that English teachers in using the CRT use learners' linguistics and cultural resources to support their learning gain and personal development. CRT teachers value their learners' personal experience and interest to address cultural gap in English learning. The cultural gap in English teaching lies on how Western values can be brought in the textbook and methods. In such a way, teachers in the periphery culture, i.e. Asian culture needs to have this awareness.

Some efforts to infuse local cultures into English teaching have been undertaken by number of researchers. Integrating Islamic content into English instruction has become a topic of growing interest, as evidenced by the increasing number of academic works exploring this research area. For example, Indonesian researchers have tried to inculcate Islamic values through chapters in the Quran, Islamic topics, and framework of instilling Islamic values into English instruction (Anshari & Widyantoro, 2020; Asmawati & Riadi, 2022; Madkur & Albantani, 2017). In a larger area, this attempt has also been initiated in other Muslim countries like Malaysia and Jordan through English teaching need analysis of Islamic content for Muslim students (Bataineh et al., 2016; Hassim & Aziz, 2021). The idea of CRT is further highlighted for number of reasons, as it caters inclusive teaching strategy, values students' cultural references, identities, backgrounds, and empowers minority students; thus, CRT can create a meaningful learning environment and help students attain academic success (McKoy et al., 2017; Rhodes, 2017; Villegas & Lucas, 2002).

However, this present study is different from the previous related research in the aspect of its context and methodology. The context where this research takes place is situated in Islamic-affiliated primary school where English is taught for young learners. Secondly, in its method, this study empowers the primary graders with series of simultaneous training on the use of Islamic topics which are derived from students' religious book, the Quran.

To provide more opportunities for students at primary school level with English exposure, enrichment programs need to be conducted. To address this concern, a program of 10-week CLIL enrichment program that infuse Islamic content was done. This community service program was held by involving English teachers, home-room teachers, primary school graders, and pre-service teachers (students of PMM Mitra Dosen program). The program is supported by the Directorate of Community Service and Research Universitas Muhammadiyah Malang (DPPM-UMM). In addition, the program is implemented to support the Sustainable Development Goals (SDGs) number 4 (United Nation, n.d.), it is quality education, mainly to improve students' English competence in receptive and productive skills. The program aims at providing more opportunities for primary graders in operating their English competence so that it prepares them for higher level of education. Thus, this community service can contribute to the improvement on students' English skill acquisition as well as the enrichment of English teaching quality at the school partner.

METHOD

This community services aims to assist student teachers and English teachers in providing an extracurricular for primary school students. The school partner is SD Aisyiyah Kota Malang, located at Jalan Gajayana III D / 570 D Dinoyo, Lowokwaru District, Malang (See Figure 2). This community services are follow-up program from the previous one (Farah & Khoiriyah, 2023; Khoiriyah et al., 2022; Waloyo et al., 2021). Hence, in this year, based on the school's need and demand, the community service program is designed in integrating CLIL (Content and Language Integrating Learning) approach in English classes, named English CLIL program. The students in higher level of primary school, consisting of fourth grade, fifth grade and sixth grade. Further, the total number of students involved in this CLIL program were 45

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students. To implement weekly program, the project team were collaborated with student teachers of English Language Education Department, Universitas Muhammadiyah Malang for assisting student to learn English. In total, the project team and school partner involved in this community services in Table. 1.

Table. 1 the participants of community service program

No.	Details	Number of people involved
1.	Project team from lecturers of English Language Education Department	2 lecturers with expertise in TESOL, material development and CLIL
2.	English teachers and home-room teachers from school partner	4 teachers (two English teachers and three home-room teachers)
3.	Student teachers from English Language Education Department	6 student teachers (students who join PMM Mitra Dosen)
4.	Primary school students	45 students
Total		57

The community services were conducted in eight months, starting from March 2023 to October 2023. To implement the community services, there were several stages including analysis, design, development, and implementation. The details are in Figure 1.

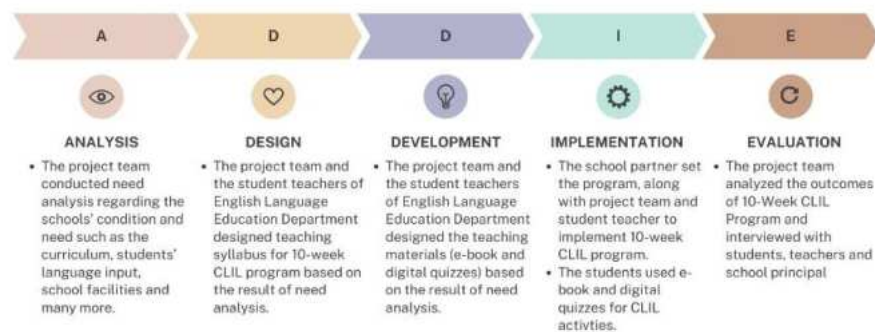


Figure 1. The stages in conducting community service program

As it was illustrated in Figure 1, this community service program was conducted in four stages. Firstly, the project team conducted need analysis regarding the schools' condition and need such as the curriculum, students' language input, school facilities and many more. Secondly, the project team and the student teachers of English Language Education Department designed teaching syllabus for 10-week CLIL program based on the result of need analysis. The project team and the student teachers of English Language Education Department designed the teaching materials (e-book and digital quizzes) based on the result of need analysis. Next, the school partner set the program, along with project team and student teacher to implement 10-week CLIL program. The students used e-book and digital quizzes for CLIL activities. Lastly, after implementing the whole program (10 meetings), the project team conducted evaluation by interviewing the students, the home-room teachers and English teacher, and the school principal of SD Aisiyah Kota Malang.

RESULTS AND DISCUSSION

Pre-implementation

Analysis

In the pre-implementation phase, the project team conducted three activities namely need analysis, designing, and developing the teaching materials. Based on the result of classroom observation and interview with the school principal, the school partner (SD Aisiyah Kota Malang, see Figure 2) has encouraged students to learn English by having international collaboration. The international schools that have collaborated with SD Aisiyah Kota Malang among others are primary schools in India (Lakshya International School Andrapradesh and Vidya Bharati School Ghaziabad) and Korea Selatan (Dajeong Primary School). In the near future, this school is also projected to have collaboration with schools in the US, Japan, and Saudi Arabia. The effort of this international projection is not only aimed at exposing students to improve their English competence but also to increase their Arabic. Thus far, the international collaboration has invited students from 3rd to 6th graders to perform speaking English and storytelling via a virtual platform, zoom.



Figure 2. School visit by the project team to SD 'Aisyiyah Kota Malang

Further, the project team formulated the problems encountered as well as its possible solution in the table 1. The problems encountered were mostly related to the need for international exposure for student, the need for contextual teaching resources based on the school vision and mission (Islamic-affiliated school) and Kurikulum Merdeka, and the need for effective teaching and learning method to improve students' English competence. The project team was in attempt to provide some solutions. One of which is by introducing CLIL program to primary school students in order to enhance their learning process in English and other content subject such as Science, Math and Islamic science (Table 2).

Table 2. The matrix of problems encountered, solutions, indicators, and outcomes

Problems encountered	Solutions	Indicators	Outcomes
The need for international language exposure for students	Mentoring for the implementation of CLIL program as an enrichment program or extracurricular	100 % Mentoring for the implementation of CLIL program as an enrichment program or extracurricular every week (within 10 week)	Teaching syllabus Ready-use teaching materials and worksheet 10-week meeting of CLIL program
The need for contextual teaching resources based on the school vision and mission (Islamic-affiliated school) and Kurikulum Merdeka	Designing student activity book by integrating English, Islamic content and other content lesson	100%In collaboration with students of PMM Mitra Dosen program and English teachers of SD Aisyiyah Kota Malang designing student activity book	Student activity book Digital worksheet
The need for effective teaching and learning method to improve students' English competence	Implementing digital students' workbook and interactive quizzes to enhance students' engagement in learning English	70% English teacher and home-room teachers are able to use and facilitate their students	ready use digital interactive quizzes

Design

Design is the second phase of ADDIE. This phase will begin with the design of digital teaching materials, which will be created in accordance with the findings of earlier needs, curriculum, and student analyses. In the design phase, the project team designed the teaching materials into a digital student workbook. The teaching materials varied based on the result of need analysis. In order to implement CLIL approach, the teaching materials are integration of English, math, science and Islamic value. Since the implementation of CLIL program was divided into 2 phases, based on the school needs, the syllabus also was designed into two parts. The details of the syllabus are presented in Table 3. The syllabus of topic animals stated in the Quran are presented in Table 4, for the second phase of CLIL program. It was implemented starting from meeting 6 to meeting 10.

Table 3. Syllabus for first phase of CLIL program

Chapter	Topic	Activity	Content materials
1	Introduction	Singing a classroom password Self-introduction	Islamic value (starting activity by reciting <i>bismillah</i> , and saying <i>hamdalah</i> – to be grateful in day-to-day activities)
2	Dream jobs	Presenting the future dream jobs Writing a letter to friends in India	Islamic value
3	Gardening	Learning about science (Part of plants) Global warning Gardening	science (Part of plants)
4	My favorite animals	Learning about lifecycle of butterfly Learning math	Science (lifecycle of butterfly) Math (addition and multiplication)
5	Save our earth	Learning about water pollution Presenting a poster	Science (water pollution)

Table 4. Syllabus for second phase of CLIL program

Chapter	Topic	Activity	Islamic Value
1	Whale	Reading Text CROWD Concept Interactive Quiz	Prophet Yunus story and the whale (Al-Anbiya: 87)
2	Birds	Reading Text CROWD Concept Interactive Quiz	Birds are symbol of Allah's power. (Al-Mulk: 19)
3	Donkey	Reading Text CROWD Concept Interactive Quiz	Allah's command of not rising voices like donkey. (Luqman: 19)
4	Camel	Reading Text CROWD Concept Interactive Quiz	Camel is one of the amazing creations that people can take benefit from it. (Al-Ghasiyah: 17)
5	Crow	Reading Text CROWD Concept Interactive Quiz	Allah sent a crow searching in the ground to show the son of Adam how to hide the disgrace of his brother. (Al-Maida: 31)

Development

In this phase, the project team developed the syllabus into teaching materials. The teaching materials were integrated in online quiz and digital student workbook as it was illustrated in Figure 3.

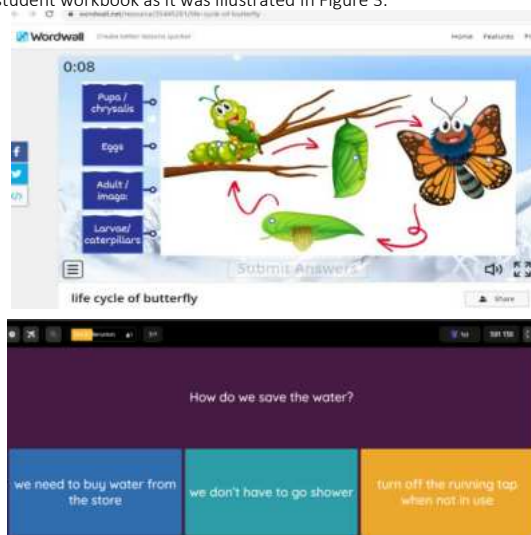


Figure 3. The exemplary of adopted digital learning sources from wordwall.net and quizzes.com

Figure 4 is the sample of material that has been developed by the project team.



Figure 4. an exemplary of digital workbook developed by the project team

Implementation

1. Students were asked to sing a long opening classroom password in every meeting

Students were given a song to open the class. This song is the opening classroom password. This song is an adaptation of a popular children's song with the lyrics changed to English and given Islamic values. In this CLIL program activity, the song chosen was a song from the famous movie "Spongebob Squarepants". The lyrics of opening classroom password are as follows:

Are you ready students? (Aye, aye Teachers)
I can't hear you (aye, aye Teachers)
Ooh
Who are ready to learn today?
(We are Marvelous)
Intelligent and excited are we
(We are Marvelous)
We learn English with so much fun
(We are Marvelous)
Let's start the class with **basmalah**
(We are Marvelous)
We are Marvelous
We are Marvelous
We are Marvelous
We are Marvelous

Meanwhile, the opening classroom password are as follows:

Goodbye my friend,
goodbye teacher,
Let's go home, let's go home,
Don't forget to say thanks,
don't forget to say thanks,
Thanks teacher,
Thanks my friends, **alhamdulillah**

2. Students learned introducing themselves and their dream jobs

The agenda for the second meeting is about dream jobs. In connection with the material at the first meeting, which was introduction, students were asked to introduce themselves and their dream jobs. Students wrote down the introduction to make it into a letter, which later would be sent to pen pal friends in India. The student-teachers (PMM

Mitra Dosen members) facilitated learning with examples of introductory sentences that students can implement, as well as providing paper with attractive designs to use as letters.

3. Students learned science and got involved in out-door activity (gardening)

The agenda for the third meeting was part of plants. The students firstly did online interactive quizzes related to parts of plant. After that, the student-teachers explained and drilled the students some words to describe parts of plant. In this activity, students were encouraged to not only learning English but also learning content subject (science). Further, one by one, students presented their speaking activities by explain part of plants in front if the class. The student-teachers gave some hints as presentation starter such as each plant has six important parts called the root, stem, leaves, flowers, fruits and seeds. The students were formed into five groups, and the student-teacher distributed plant seeds to each group. Students learn to plant using the planting media provided. After the gardening activity, the students were asked to talk about their gardening activities on a paper (Figure 5).



Figure 5. After studying science (Part of Plant), students were asked to plan a flower in their school yard

4. Students learned about science (life cycle of butterfly) and did some online quizzes

The agenda for the fourth meeting was to learn about the life cycle of butterflies. The students were divided into four groups, each group guided by one of the members of PMM Mitra Dosen. Each group learned about the butterfly life cycle, followed by quiz time using each member's laptop. After the group discussion, students were learning about multiplication with the same theme, the life cycle of butterflies.

5. Students learned about water pollution and created a public campaign related to environment

The agenda for the fifth meeting was to learn about water pollution. Students at SD Aisyiyah learned about the causes, impacts, and types of water pollution. Besides that, students also learned various new vocabulary terms regarding water pollution. At the end of the activity, the students made posters with the theme "Save the environment and save our earth". The aim was for the students to be more aware of their surroundings and maintain a clean environment (Figure 6).



Figure 6. The students presented their work under the theme "Save the environment and save our earth"

6. Students learned some animals mentioned in the Quran

In the sixth until tenth meeting, students learned some animals mentioned in the Quran such as camel, whale, donkey, birds, and crow. In those meeting, students were set to read an e-book about those aforementioned animals using a concept of read aloud activity, CROWD (Completion, Repeat, Open-ended question, Wh-question, and Distancing). In its implementation, students were divided into several groups and assisted by one student-teacher in discussing the content of the book. At the end of every topic, students were assigned to complete an interactive quizz designed using online platform such as quizziz, educandy, and wordwall. This activity was also a form of formative assessment that assess students' comprehension of a topic that recently read (Figure 7).



Figure 7. The students learned some animals mentioned in the Quran

Post-implementation

Evaluation

At the end of program, the project team interviewed the school principal, home-room teacher, student-teacher and students to have feedback on its implementation. The school principal responded positively towards the enrichment program as it gives a new direction of English learning at the school.

"I asked the students about the program they joined and they are very happy as the activities designed are new for them such as do gardening in English and they seem to enjoy learning English. That's what we want our students to instill in themselves, love learning English. With this, we are positive that we are able to support our international program at the school, also encourage our students to become part of global citizen."

Similarly, the home-room teacher who enthusiastically supervise the enrichment program feel assisted with the program.

"I observe that the student-teacher from PMM along with the project team have actively and appropriately designed the learning material that is contextualized to our students' English level and importantly the team has also created the content into more specific that is congruent to our school context. I am contented when I see my students were engaged in the activities. I asked them whether they enjoy the class and most of them nodded their head."

In other session, one student-teacher were also invited to share their hands-on experience in teaching English at the school partner.

"Thanks to the project team who supervised us in designing the material and evaluating our day-to-day teaching so that we learn handling primary graders. Also, we learn a lot how to do classroom management and in fact it is practically not that easy teaching young learners. We need to dedicate our energy to the fullest. The use of the designed materials is also helpful to our teaching." (STR1)

"I am actually a bit an introvert person, but I cannot really stand with the kids because they are very inquisitive so that I need to respond their every questions. Therefore, I also try my best to find the answers when they raised a question which I do not know the specific term in English." (STR2)

Finally, one of the students were randomly asked to have their impression joining the enrichment program.
“The activity I like the most were gardening, doing some quizzes and games, and participating in group work. I enjoy reading the animals stated in the Quran. I know that birds are toothless, they do not chew their food, they just swallow it right away, that is interesting.” (ST-AMR)

“I feel enthusiastic learning English with the student-teachers, they are very kind and helpful. With that, I am keen on completing the activities assigned to me.” (ST-ASH)

The enrichment program has attracted school partner’s attention. Teachers were all assisted with the material designs and teaching practices, students’ enthusiasm in practicing their oral skills by interacting with their peers and teachers is also observed. This community service aims to promote CLIL approach in primary school partner. The educational approach known as Content and Language Integrated Learning (CLIL) facilitates the simultaneous development of content and language (Coyle et al., 2010; Dalton-Puffer, 2011; Meyer et al., 2015). Through implementing CLIL program as an enrichment program for the school partner, the students were expected to gain more language and content knowledge input. This finding is consistent with previous research as well (Agustín-Llach & Canga Alonso, 2016; Castellano-Risco et al., 2020; Fernández-Sanjurjo et al., 2019; Gierlinger & Wagner, 2016; Jafarigohar et al., 2022; Tragant et al., 2016), positing that implementing CLIL approach enabled learners to enrich their vocabulary in target language. Therefore, the framework of 4C CLIL was integrated into the teaching and learning process. This 4C framework consists of Content, Cognition, Communication and Culture. In this CLIL program, take an example, for *Content* and *Cognition*, students were stimulated to improve their higher order thinking skills. By solving some math questions, teachers encouraged students to have more cognitive load. Students also asked to comprehend Science knowledge such as part of plant, ecosystem, water pollution. It was expected that students learned both language and content materials. Meanwhile, for *Communication*, group work and presentation were a mandatory of learning activity in every meeting. By participating in group work and classroom presentation, students were facilitated to improve their speaking skills so that they had more effective communication skills in English. Lastly, regarding *Culture*, the teaching materials were adapted related to the school context. The integration Islamic values in learning materials such as animal named in the Qur’an, was projected to promote more-relevant and contextualized foreign language learning.

Further, teachers use games and CLIL activities to engage students’ interests and improve their skills. Using games for young learners were strongly suggested to create stress-free learning environment (Behnamnia et al., 2020; Liu et al., 2021; Sun et al., 2021). This learning activity is relevant to the context of CLIL in primary schools as CLIL centers on using language *with* and *through* content, rather than treating language *as* content (Anderson et al., 2015). Using digital quizzes, the students were more engaged in learning process. They enjoyed to learn the language as well as the content materials unconsciously. According to Prensky (2011), young learners have an innate need to play games. Effectively designed educational games facilitate learning by offering pupils amusement, fervent engagement, inspiration, inventiveness, and interpersonal engagement. Those, in this 10-week CLIL program, the project team provides students with various educational games using quizzes, wordwall.net, canva and other relevant digital learning sources. The provided games were also designed in a group-work. Playing games makes students more willing to communicate both within and outside of the classroom. This is consistent with work of (Liu et al., 2021), asserting that games are very effective and powerful instruments that promote collaborative learning. In a nutshell, this collaborative learning supports the effectiveness of CLIL approach in relation to *Communication* (4C framework).

Lastly, CLIL concept is applicable to be integrated in English teaching at primary school level for two main reasons that CLIL is combining subject and language learning in one go, so learning a language will be more efficient and meaningful; second, another CLIL element is culture, that in English teaching, teachers are supposed to accommodate students’ culture. Cultural element is what matters in language learning. Using students’ cultural background is highly suggested in language classroom as it becomes a hook for students’ brain in associating their background knowledge to the new ones. This idea is supported by Culturally Responsive Pedagogy proponents who assert that English language teachers are encouraged to design their teaching by taking a serious concern on students’ cultural and linguistic background which includes their life experiences (Gay, 2018; Ladson-Billing, 2009; Villegas & Lucas, 2007; Ladson-Billing, 2006). Another urgency of infusing students’ culture in Islamic-affiliated school is mainly because English teaching has an association to ‘other values and ideologies’ which is different to Islamic worldview. English teaching is ideology-sensitive as it is not free from political and social condition (Makoni & Pennycook, 2005), it is also linked to Western discourse (Varghese & Johnston, 2007; Pennycook & Makoni, 2005; Pennycook & Coutand-Marin, 2003); whereas students’ culture at Islamic school upholds Islamic value and Eastern culture. Thus, this community service implies that teachers at Islamic-affiliated school should be aware of such issues, their main jobs are not only teaching students to be proficient in English but also to teach English in appropriately designed activities.

CONCLUSION

By providing science and Islamic value in learning materials of English enrichment program to primary graders at SD Aisyiyah Kota Malang, this community service highlights the implementation of CLIL approach for young learners. The 10-week CLIL program was implemented well, according to the results, which also shows that both the students and the school partner provided positive remarks. This study also emphasizes the fact that an enrichment program for English exposure such as CLIL program in primary schools, serves a variety of purposes, such as fostering language acquisition, content learning, and cultural awareness. This cultural awareness is crucial to provide more relevant teaching and learning activities at Islamic-affiliated school. Additionally, digital games are also used to encourage entertaining learning and increase student involvement during class sessions. The findings of this study may offer pedagogical guidance to EFL instructors—more especially, primary school teachers at Islamic school context and CLIL practitioners.

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REFERENCES

- Anderson, C. E., McDougald, J. S., & Cuesta Medina, L. (2015). CLIL for young learners. *Children Learning English: From Research to Practice*, 2000, 137–151. <https://doi.org/10.4324/9781003173151-19>
- Anshari, M. Z., & Widyantoro, A. (2020). Inculcating Islamic values contented in Qs. Luqman through english speaking materials. *Journal of Education and Learning (EduLearn)*, 14(1), Article 1. <https://doi.org/10.11591/edulearn.v14i1.14285>
- Asmawati, A., & Riadi, A. (2022). Integrating Islamic values into english materials. *English Language, Linguistics, and Culture International Journal*, 2(3), Article 3. <https://doi.org/10.24252/elstic-ij.v2i3.34684>
- Agustín-Llach, M. P., & Canga Alonso, A. (2016). Vocabulary growth in young CLIL and traditional EFL learners: evidence from research and implications for education. *International Journal of Applied Linguistics (United Kingdom)*, 26(2), 211–227. <https://doi.org/10.1111/ijal.12090>
- Behnamnia, N., Kamsin, A., Ismail, M. A. B., & Hayati, A. (2020). The effective components of creativity in digital game-based learning among young children: A case study. *Children and Youth Services Review*, 116(March), 105227. <https://doi.org/10.1016/j.childyouth.2020.105227>
- Bataineh, R., Jaber, E., & Bataineh, R. (2016). The Compatibility of total English with the Arab Islamic culture as Revealed by content analysis and Jordanian EFL instructors' and students' views. *International Journal of Language and Applied Linguistics*, 2, 19–43.
- Byram, M. (2008). From foreign language education to education for intercultural citizenship essays and reflections. Great Britain: The Cromwell Press Ltd.
- Castellano-Risco, I., Alejo-González, R., & Piquer-Piriz, A. M. (2020). The development of receptive vocabulary in CLIL vs EFL: Is the learning context the main variable? *System*, 91. <https://doi.org/10.1016/j.system.2020.102263>
- Coyle, D. (2015). Strengthening integrated learning: Towards a new era for pluriliteracies and intercultural learning. *Latin American Journal of Content and Language Integrated Learning*, 8(2), 84–103. <https://doi.org/10.5294/lacil.2015.8.2.2>
- Coyle, D., Hood, P., & Marsh, D. (2010). *Content and language integrated learning*. Cambrigde.
- Dalton-Puffer, C. (2011). Content-and-language integrated learning: From practice to principles? *Annual Review of Applied Linguistics*, 31, 182–204. <https://doi.org/10.1017/S0267190511000092>
- Ellis, R. (1994). The study of second language acquisition. Oxford: University Press.
- Farah, R. R., & Khoiriyah. (2023). Implementation of CLIL program in Islamic affiliated primary school: Teaching assistants project. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, 10(1), 92–103. <https://doi.org/10.24256/ideas.v11i1.3691>
- Fernández-Sanjurjo, J., Fernández-Costales, A., & Arias Blanco, J. M. (2019). Analysing students' content-learning in science in CLIL vs. non-CLIL programmes: empirical evidence from Spain. *International Journal of Bilingual Education and Bilingualism*, 22(6), 661–674. <https://doi.org/10.1080/13670050.2017.1294142>
- Gay, G. (2018). *Culturally responsive teaching: Theory, research, and practice*. Teachers College Press.
- Gay, G. (2015). The what, why, and how of culturally responsive teaching: International mandates, challenges, and opportunities. *Multicultural education review*, 7(3), 123–139. [10.1080/2005615X.2015.1072079](https://doi.org/10.1080/2005615X.2015.1072079)

Commented [J6]: Information regarding funding must be written (if any), complete with contract number or assignment letter

Commented [J7]: The minimum number of references is 35, 80% must be from journals, most must be from reputable international journals, articles cited must be up to date (2014-2024).

- Gierlinger, E. M., & Wagner, T. A. (2016). The more the merrier – revisiting CLIL-based vocabulary growth in secondary education. *Latin American Journal of Content & Language Integrated Learning*, 9(1), 37–63. <https://doi.org/10.5294/lacil.2016.9.1.3>
- Hassim, S. H., & Aziz, A. A. (2021). Using Soleh English (SE) teaching materials with the integration of cultural and Islamic values: Islamic preschool teachers' voices. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 6(4), Article 4. <https://doi.org/10.47405/mjssh.v6i4.733>
- Heras, A., & Lasagabaster, D. (2015). The impact of CLIL on affective factors and vocabulary learning. *Language Teaching Research*, 19(1), 70–88. <https://doi.org/10.1177/1362168814541736>
- Jafarigohar, M., Divsar, H., & Etemad, P. (2022). The effect of CLIL context on the primary education EFL receptive and productive lexical growth. *Language Teaching Research*, 00(0), 1–25. <https://doi.org/10.1177/13621688221078997>
- Ladson-Billings, G. (2006). Yes, but how do we do it? Practicing cultural relevant pedagogy. *ESED 5234 - Master List*. 37. <https://digitalcommons.georgiasouthern.edu/esed5234-master/37>
- Ladson-Billings, G. (2009). *The dreamkeepers: Successful teachers of African American students*. San Francisco, CA: Jossey-Bass. <https://eric.ed.gov/?id=ED373128>
- Liao, H., & Li, L. (2023). Facilitating EFL learners' intercultural competence through culturally responsive teaching in oral English classrooms. *System*, 115. <https://doi.org/10.1016/j.system.2023.103070>
- Liu, F., Vadivel, B., Rezvani, E., & Namaziandost, E. (2021). Using games to promote English as a foreign language learners' willingness to communicate: Potential effects and teachers' attitude in focus. *Frontiers in Psychology*, 12(October), 1–10. <https://doi.org/10.3389/fpsyg.2021.762447>
- Madkur, A., & Albantani, A. M. (2017). Instilling Islamic values in foreign language teaching: An Indonesian context. *ICEMS*, 97–103. <https://doi.org/10.2991/icems-17.2018.20>
- Makoni, S., & Pennycook, A. (2005). Disinventing and (re) constituting languages. *Critical Inquiry in Language Studies: An International Journal*, 2(3), 137–156. https://doi.org/10.1207/s15427595cils0203_1
- Marsh, D., & Langé, G. (2000). Using languages to learn and learning to use languages. Finland: University of Jyväskylä, 88, 36–39. <http://clilcompendium.com/1uk.pdf>
- Mattsson, A. F., & Norrby, C. (2013). Language acquisition and use in multilingual contexts. *Theory and Practice Language Policy in Practice View project Grammar in interaction View project*. <https://lucris.lub.lu.se/ws/portalfiles/portal/5329199/4075031.pdf>
- McKoy, C. L., MacLeod, R. B., Walter, J. S., & Nolker, D. B. (2017). The Impact of an In-Service Workshop on Cooperating Teachers' Perceptions of Culturally Responsive Teaching. *Journal of Music Teacher Education*, 26(2), 50–63. <https://doi.org/10.1177/1057083716629392>
- Meyer, O., Coyle, D., Halbach, A., Schuck, K., & Ting, T. (2015). A pluriliteracies approach to content and language integrated learning – Mapping learner progressions in knowledge construction and meaning-making. *Language, Culture and Curriculum*, 28(1), 41–57. <https://doi.org/10.1080/07908318.2014.1000924>
- Nugroho, A. (2020). Content and Language Integrated Learning practice in English for Accounting course. *IJET (Indonesian Journal of English Teaching)*, 9(2), 172–181. <https://doi.org/10.15642/ijet2.2020.9.2.172-181>
- Pennycook, A., & Makoni, S. (2005). The modern mission: The language effects of Christianity. *Journal of Language, Identity & Education*, 4(2), 137–155. https://doi.org/10.1207/s15327701jlie0402_5
- Pennycook, A., & Coutand-Marin, S. (2003). Teaching English as a missionary language. *Discourse: Studies in the cultural politics of education*, 24(3), 337–353. <https://doi.org/10.1080/0159630032000172524>
- Prensky, M. (2011). *Fun, play and games: What makes games engaging*. New York: Digital Game-Based Learning. McGraw-Hill.
- Rhodes, C. M. (2017). A validation study of the culturally responsive teaching survey. *Universal Journal of Educational Research*, 5(1), 45–53. <https://doi.org/10.13189/ujer.2017.050106>
- Sun, L., Ruokamo, H., Siklander, P., Li, B., & Devlin, K. (2021). Primary school students' perceptions of scaffolding in digital game-based learning in mathematics. *Learning, Culture and Social Interaction*, 28(August 2020), 100457. <https://doi.org/10.1016/j.lcsi.2020.100457>
- Torres-Velasquez, D., Lobo, G., Parker, I. McCaskey, R., & Robichaux-Davis, R. R. (2023). "Culturally responsive mathematics teaching and English language learners." *Mathematics Teacher: Learning and Teaching PK-12*, 115(9). <https://doi.org/10.5951/mtlt.2022.0171>
- Tragant, E., Marsol, A., Serrano, R., & Llanes, Á. (2016). Vocabulary learning at primary school: a comparison of EFL and CLIL. *International Journal of Bilingual Education and Bilingualism*, 19(5), 579–591. <https://doi.org/10.1080/13670050.2015.1035227>
- United Nation. (n.d). *The 17 goals*. Retrieved October 30, 2023, from <https://sdgs.un.org/goals>. at 13.29
- Varghese, M. M., & Johnston, B. (2007). Evangelical Christians and English language teaching. *TESOL Quarterly*, 41(1), 5–31. <http://www.jstor.org/stable/40264329>
- Villegas, A. M., & Lucas, T. (2002). Preparing culturally responsive teachers: Rethinking the curriculum. *Journal of Teacher Education*, 53(1), 20–32. <https://doi.org/10.1177/0022487102053001003>

- Villegas, A. M., & Lucas, T. (2007). The culturally responsive teacher. *Educational leadership*, 64(6), 28.
<https://eric.ed.gov/?id=EJ766361>
- Xanthou, M. (2011). The impact of CLIL on L2 vocabulary development and content knowledge. *English Teaching: Practice and Critique*, 10(4), 116–126.