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Digitalizing History: Development of E-Module for History Learning on the Subject of Japanese Colonialism Period in Indonesia

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Abstract

This study aims to investigate the effectiveness of using e-module teaching materials in history education. This study is development research conducted using direct observation techniques and the distribution of questionnaire surveys to the research location, in this case, SMA Srijaya Negara Palembang. The development of teaching materials was conducted using the Rowntree model, which comprises three stages: planning, development, and evaluation. The criteria utilized included the success rate and students' achievement in learning activities. The research findings indicate that the utilization of case-based learning e-modules is valid and suitable for history education in classrooms. This is supported by assessments from three validators of the materials, media and language aspects of the e-module, categorized as highly valid (4.4); individual assessments as valid (4.1); and small group assessments as highly valid (4.2). Moreover, there is a noticeable improvement in the students' learning outcomes, classified as valid (88.0), with an effectiveness score of N-gain reaching 0.80, falling into the high or very effective category.

Keywords: *Digitalizing History; Development; E-Module; SMA Srijaya Negara Palembang.*

INTRODUCTION

In this era of globalization, advances in science and technology (IPTEK) have become the cornerstone of the transformation in various sectors of life (Wuhe et al., 2021). One of the aspects most profoundly impacted is the education sector. The digitalization of education is a tangible manifestation of the integration of IPTEK in the learning process (Eka et al., 2023; Siti et al., 2021). This transformation not only modernizes teaching methods but also expands access to knowledge (Arviansyah &

Safitri, 2022; Ulfah et al., 2022). By leveraging technology, learning becomes more flexible and accessible (Arviansyah & Shagena, 2022).

One application of technological advancements in education is the implementation of e-modules or digital modules (Minamatov & Turobova, 2021; Usman et al., 2023). E-modules have become a key instrument in supporting the digitalization of education (Kalimullina et al., 2021). These modules facilitate the presentation of learning materials in an interactive format that can be accessed online (Arviansyah & Shagena, 2022; Liu et al., 2020) . Through the use of e-modules, it is expected to provide a new experience for students with various conveniences (Putri & Syarifuddin, 2023).

The convenience of e-modules allows students to study according to their learning styles (Duszenko et al., 2022; Ernawati & Susanti, 2021; Guiamalon et al., 2021) creating a more personalized and adaptive learning environmentz (Erdi & Padwa, 2021; Vesin et al., 2018; Zyu, 2022). However, based on the findings from observations and interviews conducted at SMA Srijaya Negara, there are various issues, including a low interest in literacy among students due to the perceived monotony of the learning process. This monotony arises because, in practice, teaching and learning activities still rely on thick, printed textbooks.

The limitations of using printed books in teaching are also attributed to the lack of training and guidance for teachers in creating engaging teaching materials based on technology (Amin, 2019). Therefore, the researchers here leverage available technology by creating teaching materials that can be utilized by both teachers and students in the learning process. Given this situation, there is a need for innovation in creating technology-based teaching materials that can facilitate students in understanding a subject (Sukmawati, 2021). Thus, this study aims to develop teaching materials in the form of e-modules (Nikou & Economides, 2018).

The use of e-modules as teaching materials can provide significant solutions and innovations in supporting the learning process (Cahyati et al., 2022). This is because of the integration of multimedia elements such as images, audio, and video (Noeryanti & Rejekiningsih, 2023), which would make the learning process more engaging and interactive (Keleşzade et al., 2018; Linzalone et al., 2020). By carefully designing said e-modules, we can create a learning experience that aligns with the individual needs of the students (Crisianita & Mandasari, 2022; van Boxtel & van Drie, 2018).

This presents a challenge in the history subject, particularly at SMA Srijaya Negara Palembang, where this research was conducted. The selection of this school was based on the implementation of the 2013 curriculum, which is still in effect and aligns with the materials developed by the researchers. Additionally, the availability of adequate internet access and permission for students to bring

smartphones provide support in the implementation of e-modules in the learning activities conducted.

The idea of applying electronic modules to learning activities in this study is supported by several previous, related studies on the matter, the first one being that from Susanti and Chairunisa (2020) titled "Development of E-Modules for Learning the History of Development Figures Post-Independence in South Sumatra," trying to gauge students' perceptions regarding the tested modules in their learning activities. Their study also indicates the success of electronic module teaching materials in learning.

Another study by Herwina et al., (2023) titled "Development of E-Modules Assisted by Sigil Software in High School History Subjects" showed practicality in this regard based on their data processing and practicality testing involving teachers and students with a practicality level of 80.73% deemed "very practical," indicating positive responses from students to the use of such e-modules in the learning.

Additionally, the study by Oktari, (2021) titled "Development of 3D PageFlip-Based Electronic History Modules" indicated that the use of e-modules had facilitated the teaching process they conducted. The module could be effectively and efficiently used by teachers to deliver learning materials to their students.

Based on the relevant research mentioned above, it can be concluded that the use of e-modules in the learning process is effective, as evidenced by the students' improved learning outcomes after using said e-modules. The novelty in the current study, meanwhile, lies in the development of history learning e-modules using the Calibre application, focusing on the Japanese colonization of Indonesia.

Calibre is one of several feasible applications to be used in creating digital learning modules. It can be easily used to create digital modules as it is open-source based on E-pub (electronic publication) introduced by the International Digital Publishing Forum (IDPF) in 2011. Additionally, the advantage of using Calibre is its accessibility on both smartphones and laptops (Mahsup et al., 2023).

Therefore, this study aims to develop teaching materials not only as a means in the learning process but also with a specific focus on increasing motivation and ease of use for both teachers and the 11th-grade Science 2 students at SMA Srijaya Negara Palembang as the research participants. The development of these e-modules is expected to facilitate the learning of history and make it easier for students to understand the material.

METHODS

The development of e-modules in this study on the topic of the Japanese colonization of Indonesia is conducted through a development research method, as illustrated in Figure 1 below:

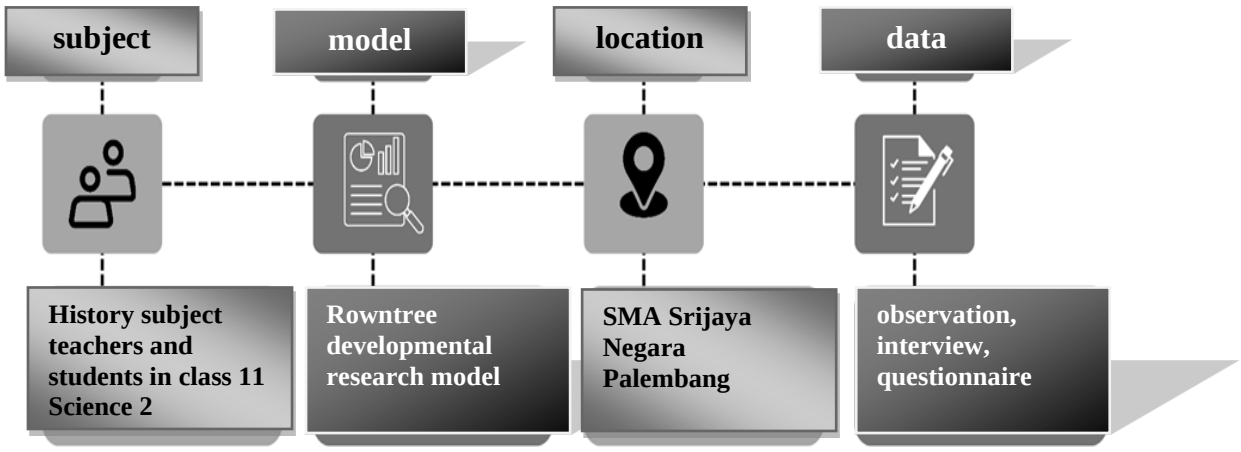

Figure 1. Research Method

As seen in Figure 1, the research method employed in this study is the Rowntree model development research, with the subjects being history teachers and 11th-grade Science 2 students at SMA Srijaya Negara. The research process was conducted at SMA Srijaya Negara, Palembang, and the data were collected through observation, interviews, and questionnaires. The data obtained were then analyzed from the results of the students' learning outcomes using the basic pre-test and post-test comparison formula and N-gain score formula. Development research is a method used to create and develop new products such as teaching modules, learning media, teaching materials, learning models, teaching methods, books, and more (Prucha et al., 2016). The research location is at SMA Srijaya Negara, Palembang, which is one of several private schools in the city.

The development model and its subsequent stages designed by the researchers in this study can be seen in Figure 2 below:

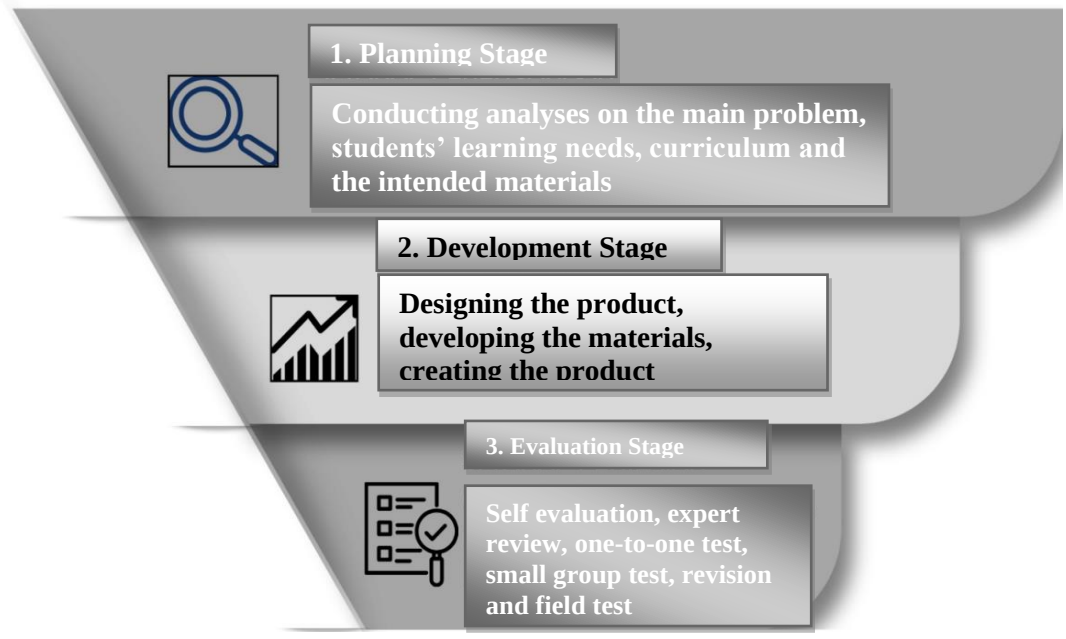

Figure 2. Rowntree Developmental Research Design

The diagram above represents the Rowntree development model, divided into several stages followed herein: planning, development, and evaluation (Dua Dhiu & Ngurah Laba Laksana, 2021). In the planning stage, direct observation was conducted by visiting the 36 students of class XII Science 2 at SMA Srijaya Negara Palembang for observation during their learning and for carrying out interviews with the history teachers at the school (Kurniawati et al., 2017; Onishchuk et al., 2020). Additionally, a questionnaire containing a survey was distributed to understand the various learning needs of the students and gather feedback from them (Fulcher, 2012).

Moving on to the development stage, it involves four follow-up steps. Firstly, the researchers designed the intended e-module learning product, followed by developing the material topic to be put in the e-module, then created the product itself, and finally drafted expert validation sheets. Furthermore, in the evaluation stage, formative assessment by Tessmer (Fahmir et al., 2021) was employed. Tessmer's assessment consists of five types of tests of its own: self-assessment, expert assessment, one-to-one (or individual) assessment, small group assessment, and field test (Osman et al., 2021).

The instruments used in this developmental research include 1) direct observation, conducted by the researchers in the planning stage to observe the school's conditions, students, and the learning environment; 2) interviews, used to identify various issues in the learning process, curriculum use, materials, and teaching aids; and 3) questionnaires, used to measure the ease of use of the developed product and assess students' understanding.

The validation score categories, converted from qualitative data to quantitative data, can be seen in Table 1 below:

Table 1. Conversion of qualitative data to quantitative data

Average score	Criteria
>4.2 s/d 5.0	Very valid
>3.4 s/d 4.2	Valid
>2.6 s/d 3.4	Less valid
>1.8 s/d 2.6	Invalid
>1.8 s/d 2.6	Invalid

(Source: Prahani et al., 2016)

The data obtained were then analyzed descriptively and statistically. Qualitative data, in the form of various comments and suggestions for improvement, were described qualitatively and descriptively for further product revision. A conversion table for the data and their analysis referring to and adapted from Syakura (2017) was used.

Regarding the field test activity, the researchers involved 36 11th-grade Science 2 students to assess the impact of using the product. Data in this testing process were obtained through pre-test and post-test sessions given to the students, and the analysis was conducted using the calculation of the N-gain score to determine expected improvements in the students' learning outcomes. The N-gain score can be obtained through the following formula:

$$N - gain = \frac{Posttest\ Score - Pretest\ Score}{Maximum\ Score - Pretest\ Score}$$

(Source: Prahani et al., 2016)

Following this, the results of the average N-gain calculation can be classified into criteria as shown in Table 2 below:

Table 2. Categorization of N-gain score

Percentage	Criteria
$g \geq 0.7$	High (very effective)
$0.3 \leq g < 0.7$	Medium (effective)
$g < 0.3$	Low (not effective)

(Source: Oksa & Soenarto, 2020)

RESULT AND DISCUSSION

E-modules have become an engaging instructional tool in educational contexts with the use of digital technology getting more implemented in schools (Rawashdeh et al., 2021). This aligns well with the innovative 21st-century learning approach, which focuses on technology-based engaging education (Arabloo et al., 2022). However, it is acknowledged that the implementation of technology-based instructional materials in education is not yet widespread (Malicka et al., 2019). With this in mind, this study was aimed at filling in this learning gap by developing an e-module entitled "Digitalizing History: Development of E-Module for History Learning on the Japanese Colonialism Period in Indonesia." Following the steps of the Rowntree research and development model, consisting of three stages, the outcomes of the research process are as follows:

Planning

In the planning stage, a set of analyses of problems, students' needs, curriculum, and materials was conducted. For the problem analysis, the researchers interviewed history teachers at SMA Srijaya Negara Palembang. Regarding the needs analysis, it can be seen in Figure 3 below:

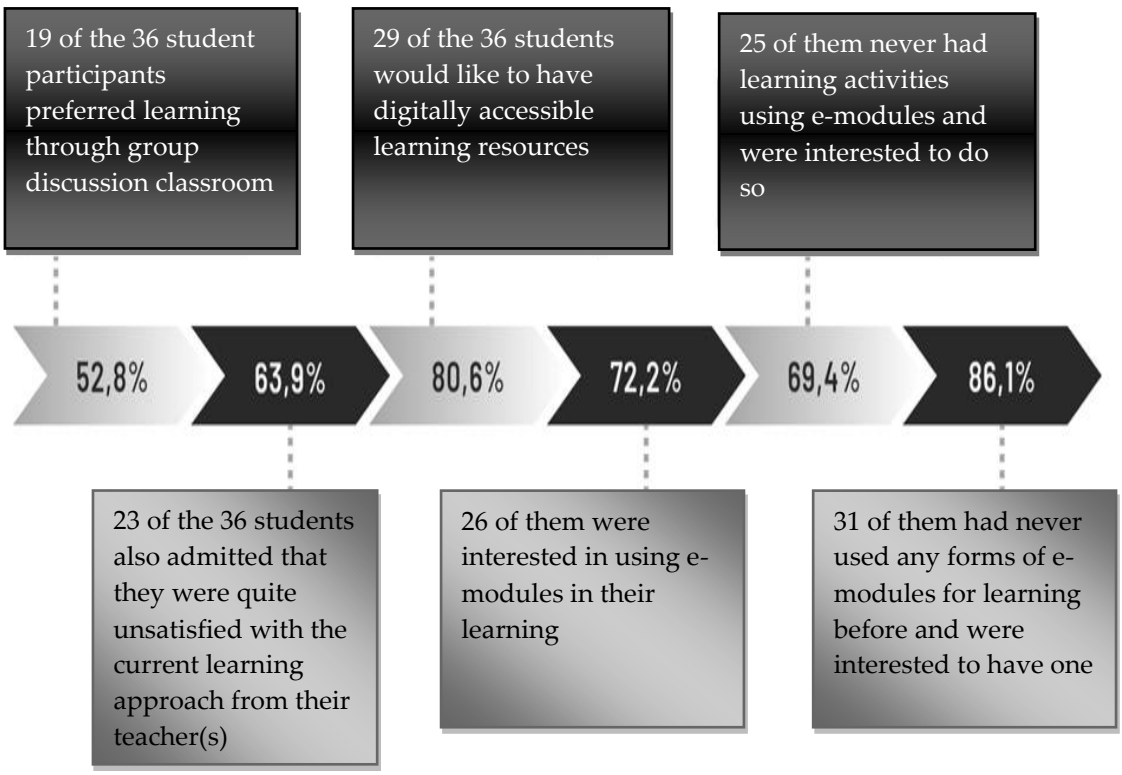

Figure 3. Analysis of Students' Learning Needs

Based on the needs analysis results, it can be concluded that only a relatively small number of students were satisfied with traditional history teaching methods. The majority of students have not used e-modules in their learning processes but express a strong interest in doing so. Interview data also indicates a desire for innovative and engaging learning methods using attractive learning media.

This study employed the Rowntree development model, focusing on developing a product in three steps: planning, development, and evaluation (Dua Dhiu & Ngurah Laba Laksana, 2021). In the planning stage, direct observation was conducted by visiting SMA Srijaya Negara for two observation activities (i.e. on the students and the teachers), the results of which are as follows:

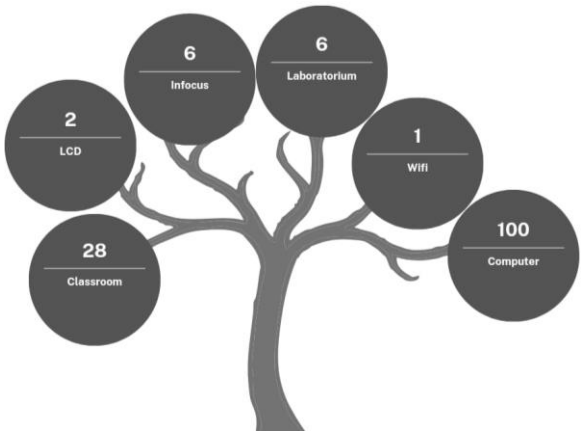

Figure 4. Observation results

Based on the observation results and interviews with history teachers regarding the material to be developed in the e-module, questionnaire surveys were also distributed to the students (Kurniawati et al., 2017; Onishchuk et al., 2020). Additionally, a questionnaire was distributed to understand various students' learning needs and gather their feedback (Fulcher, 2012).

In this context, it is evident that students require e-modules as a novel and technology-based instructional tool. For this reason, the researchers modified the details of the sub-materials to be covered, as seen in Figure 5 below:

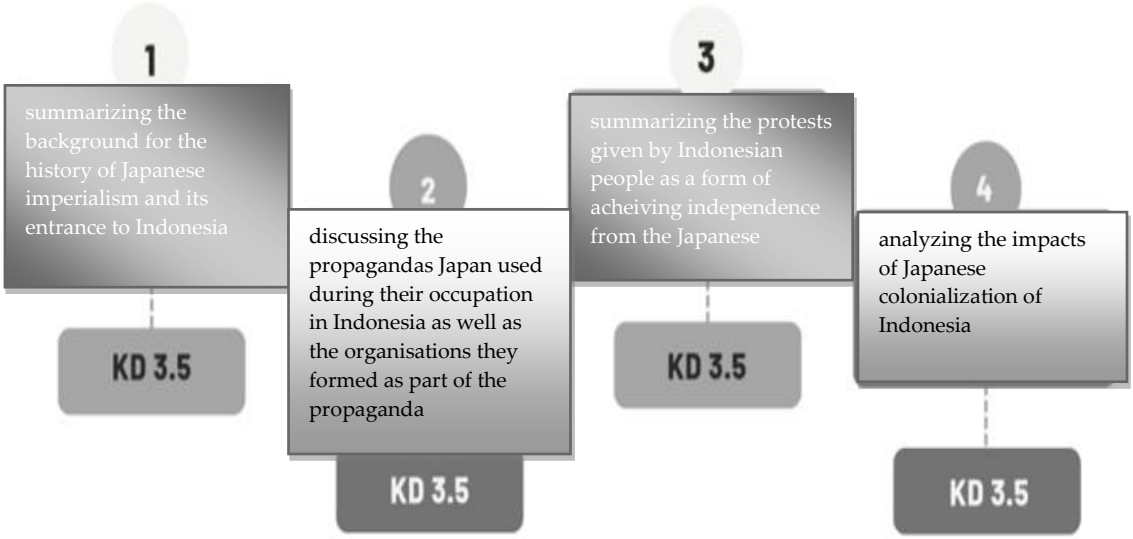

Figure 5. Analysis of the Intended Materials

In the material analysis shown above, it can be seen the research activities of observing and interviewing history teachers at the research location about the Competence Basis and the material to be developed, which are part of the 2013 curriculum. Curriculum analysis was also conducted, revealing that students at SMA Srijaya Negara in grade 10 use the Merdeka curriculum, while students in grades 11 and 12 use the 2013 curriculum.

Development

This study focuses on creating and developing a product in the form of an e-module using the Calibre application. The development steps begin with designing and conceptualizing the material, including selecting learning objectives, followed by the processing of said material and the creation of the e-module using the Calibre application itself, which involves designing the cover, creating the content, and adding elements such as photos, illustrations, backgrounds, color selection, and layout adjustments. Below is the initial display of the e-module, as seen in Figure 6:


MODUL AJAR SEJARAH
PENDUDUKAN JEPANG DI INDONESIA
KELAS XI SMA/MA
M. Reza Arviansyah


DAFTAR ISI
PENDUDUKAN JEPANG DI INDONESIA


DAFTAR GAMBAR
PENDUDUKAN JEPANG DI INDONESIA


PENDAHULUAN
A. Identitas Modul
Mata Pelajaran : Sejarah Indonesia
Kelas/Semester : XI/Genap
Alokasi Waktu : 40 Menit
Judul Modul : Pendudukan Jepang di Indonesia
B. Kompetensi Dasar
3.5 Menganalisis Sifat Pendudukan Jepang dan respon bangsa Indonesia
4.5 Menalar sifat pendudukan Jepang dan respon bangsa Indonesia dan menyajikannya dalam bentuk cerita sejarah
C. Deskripsi Singkat Materi
D. Petunjuk Belajar
PENDUDUKAN JEPANG DI INDONESIA

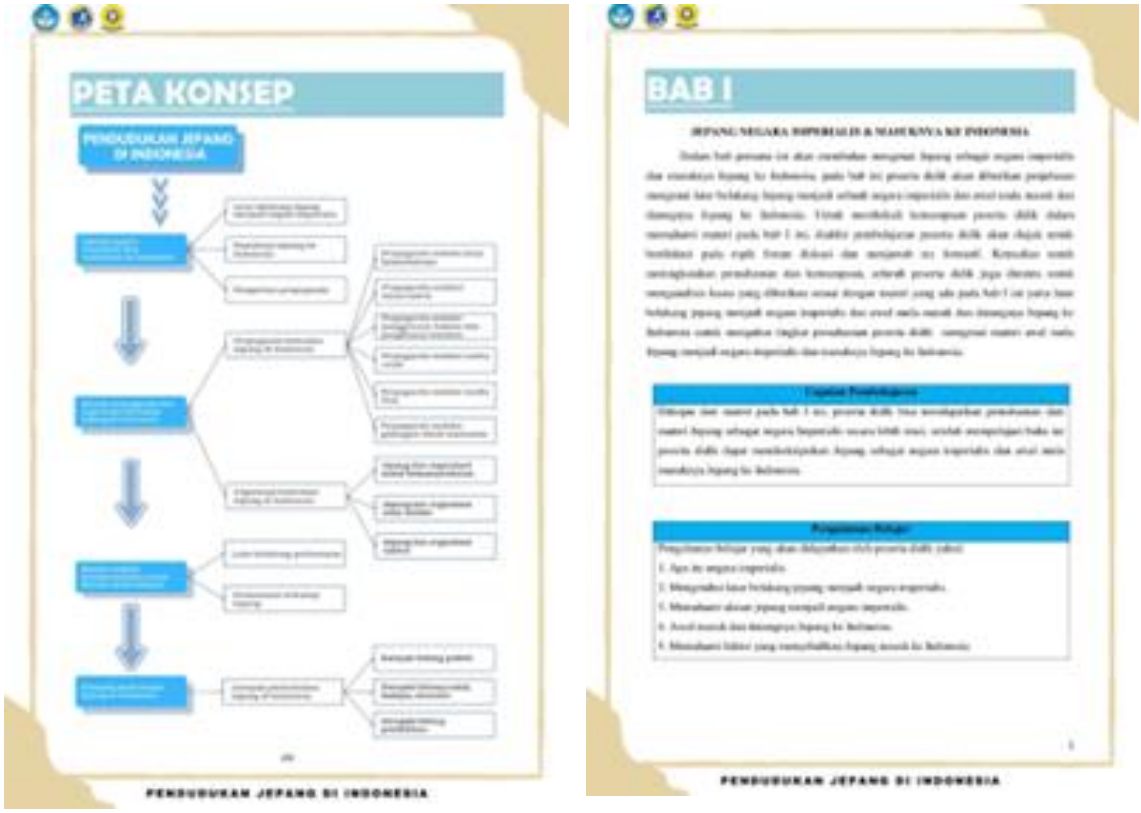

Figure 6. Initial look of the developed e-module

Evaluation

Self-evaluation was conducted on the developed e-module. Subsequently, an evaluation and scoring were carried out by experts regarding its several key aspects: Helen Susanti, M.A., an expert in history learning content, Yudi Pratama, M.Pd., an expert in learning media design, and Vitria Marsela, M.Pd., an expert in language structure, as shown in Table 3 below:

Table 3. Results of the Expert Validation Process

No	Aspects validated	Average
1.	Materials	4.7
2.	Media	4.6
3.	Language	4.1
	Total average	4.4 (very valid)

Based on Table 3, it can be observed that, in addition to obtaining an average score of 4.4, the validators also provided suggestions and feedback for improvement in this e-module. Various suggestions and feedback provided by the validators can be seen in Table 4 below:

Table 4. Summary of comments and advice from the expert validators

No	Comment from the expert	Before	After
1.	Provide more references to enrich the materials and give the e-module more factual strength—at least one reference per paragraph		
2.	The references need to be written more consistently		
3.	Wrong uses of capital letters and misplacement of several punctuations need to be addressed, as well as some mistakes in using italics and bold types		

Based on Table 4, the evaluation was conducted to measure the level of validity of the product, guided by the assessment of the validators. The evaluation was carried out according to various suggestions provided by the validators. Validators involved in the evaluation process were experts in history content, history learning media, and Indonesian language usage. After the evaluation and revision based on the received feedback, the developed e-module became suitable for field testing.

The next step involved field testing, consisting of individual and small group testing activities. The results obtained from the field testing process are presented in Table 5 below:

Table 5. Results of the individual and small group testing

No	Kind of test	Average
1.	One-to-one	4.3 (very valid)
2.	Small group	4.4 (very valid)
	Total average	4.35 (very valid)

Based on Table 5 above, the conducted field testing process has proven that the developed e-module in this study can be implemented in the learning process. As explained, the field testing process was conducted before the application of the developed media.

Next, field testing was conducted with 36 11th-grade Science 2 students at SMA Srijaya Negara Palembang. Initially, a pre-test and post-test were administered at the end of the learning process. In the pre-test stage, students obtained low scores and an overall low average. The recapitulation of the students' pre-test and post-test scores can be seen in Figure 7 and 8 below:

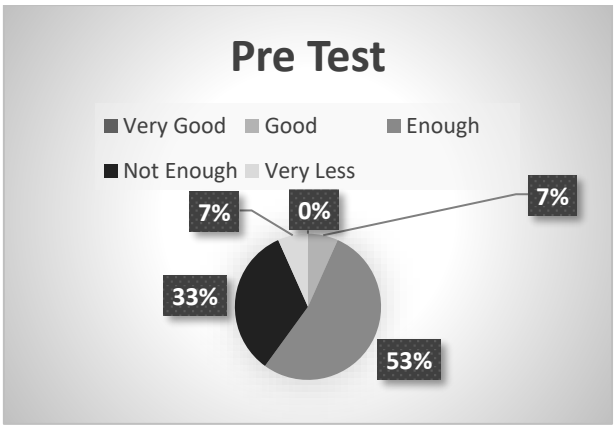

Figure 7. Result of the pretest session

Based on the recapitulation graph of pre-test scores above for the 36 participants, the majority of the students received scores in the relatively low range, with 16.53% falling in the 41-60 score range (considered adequate), while 10.33% scored in the 21-40 range (considered inadequate).

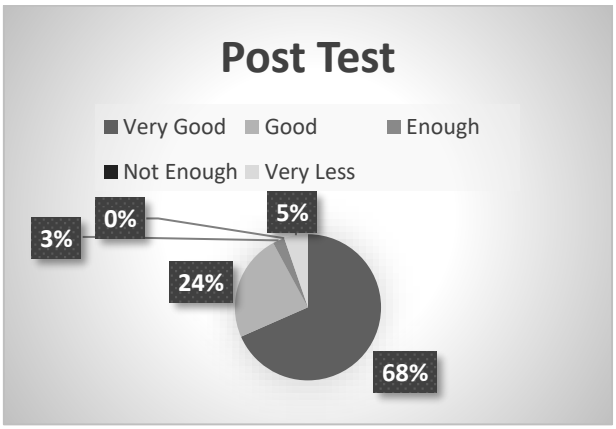

Figure 8. Result of the posttest session

The recapitulation graph of the post-test scores above for the 36 participants, meanwhile, shows a significant improvement compared to the pre-test results. The

majority of the students demonstrated an increase in their understanding of the tested material. Specifically, 68% of them achieved the highest scores in the 81-100 range (categorized as very good) while 9.24% achieved scores in the 61-80 range (categorized as good).

A comparison of the pre-test and post-test scores achieved by the student participants can be seen in Figure 9 below:

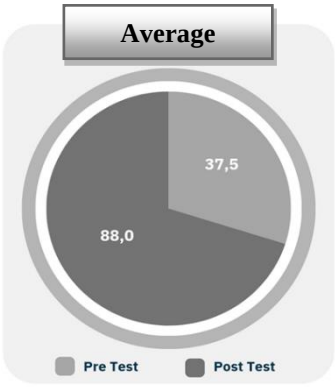

Figure 9. Comparison between the pretest and posttest results

The comparison graph between pre-test and post-test scores above illustrates an improvement in students' understanding of the material. The pre-test and post-test scores were calculated using the N-gain formula, and the results can be seen in Table 6 below:

Table 6. Average student scores in the pretest and posttest sessions

Pretest average score	Posttest average score	N-gain
37.5	88.0	0.80

Looking at Table 6, the analysis of individual improvements in their understanding shows an increase in the average score from 37.5 to 88.0. The average N-gain or score improvement reaches 0.80. Therefore, the use of case-based learning e-modules as instructional materials that this study was focused on has successfully and significantly improved students' understanding of the history of Japanese colonialism material, both for those with initially low understanding and those with a better understanding. This indicates the effectiveness of using e-modules to enhance students' understanding of the provided material.

Discussion

With the continuous development of the education sector, digitalization is progressing rapidly (Kalolo, 2019; Malahilla et al., 2023). Referring to the research results, the e-module-based case-based learning on the Japanese colonization of Indonesia provides new information for students, positively impacting learning

outcomes. The results obtained in the pre-test session for the 36 students involved had an average score of 37.5. Meanwhile, in the post-test session, completed by the same 36 students, there was a significant improvement in their test scores, with an average N-gain score of 88.0.

This improvement can be attributed to the students' enthusiasm in engaging with the learning material and their interest in the e-module on the Japanese colonization of Indonesia. This aligns with Antari's (2023) the opinion that the use of e-modules can enhance students' motivation and encourage critical thinking. Furthermore, as stated by Amartha (2022), e-modules can enhance students' independence in studying because the interactive and enjoyable nature of e-modules makes the learning process more active, leading to improved learning outcomes.

The increase in students' learning outcomes is evident from the 50.5% rise in the percentage comparison between pre-test and post-test scores. Some students experienced significant improvement, and this can be associated with the role of constructivist learning theory. According to Lin et al. (2021), a person's cognitive structure can develop and change when acquiring knowledge and experience. Research conducted by Khozaei (2022) supports the idea that students applying the constructivist learning theory achieve higher learning achievements compared to those using traditional learning approaches (Magdalena, et al., 2020; Pratiwi, 2022; Syarifuddin et al., 2021).

The influence of implementing the constructivist learning theory is notable because, during the classroom learning activities, students attentively followed the explanations presented through the e-module on the Japanese colonization of Indonesia, displayed using engaging PowerPoint slides. Consequently, the delivered material is absorbed effectively and becomes easy to remember (Tafakur et al., 2023). This aligns with a perspective from Bawamenewi (2019) that well-developed modules are systematically organized, making it easier for students to achieve the learning objectives.

The e-module on the Japanese colonization of Indonesia presents both advantages and disadvantages in the realm of education. On the positive side, it offers ease of access through a convenient Google Drive link, ensuring students can readily engage with the content. The comprehensive nature of the learning materials, utilizing a case-based approach with a blend of text, images, and videos, enhances the educational experience by making it engaging and appealing. Moreover, the e-module is designed with a high level of complexity, incorporating core competencies, indicators, and learning objectives that align with students' achievements, promoting a more profound understanding of the Japanese colonization of Indonesia.

However, the e-module on the Japanese colonization of Indonesia comes with its set of disadvantages. Firstly, it introduces device dependency, as students need electronic devices like smartphones or laptops to access the module. This may pose a challenge for those without such devices, creating a potential barrier to their engagement with the educational content. Additionally, the digital format of the module raises concerns about prolonged screen exposure, potentially leading to eye strain or fatigue for students who need to concentrate on the material continuously, whether on smartphones or laptops. These drawbacks highlight the importance of considering accessibility and the impact of digital learning on students' well-being in the context of e-modules.

CONCLUSION

Based on the research findings and the analysis conducted throughout the study, the conclusion regarding the development of an e-module on the history of the Japanese colonization of Indonesia at SMA Srijaya Negara Palembang using the Calibre application is that it is both valid and effective for use in history learning activities. The validity is evident from the assessment results obtained from the validators, encompassing content, media, and language aspects of the learning media, all yielding an average score categorized as highly valid at 4.4. The effectiveness is demonstrated by the average learning outcomes score of the students, which reached 88.0.

The electronic module developed in this study successfully meets the criteria for good validity and effectiveness as a learning resource, allowing history subjects to be used as alternative teaching material for both teachers and students to support their teaching and learning activities. The presence of technology-based teaching materials like this is expected to promote digital literacy skills, thereby further enhancing historical thinking abilities.

The development of electronic modules can have a positive impact on teachers specifically, transforming the learning styles from conventional to more diverse, engaging, and efficient using these modules in line with curriculum demands for IT-based teaching. Additionally, these electronic modules can be used for both face-to-face and online learning.

The developed e-module in this study meets the criteria of being valid and effective, making history a potential alternative teaching material for both teachers and students to support the teaching and learning process. The integration of digital technology-based teaching materials is expected to enhance digital literacy skills, ultimately improving historical thinking. Therefore, considering the application of science and technology in history education is crucial. A suggestion for future research would be to explore the development of e-modules using alternative

teaching methods such as problem-based learning. The diversity in e-module applications can be a solution to enhance students' digital literacy skills and create engaging history teaching materials aligned with 21st-century innovative learning approaches.

REFERENCES

Ali, J. (2018). Outbound as The Alternative Method to Have Fun Arabic Learning. *Alsinatuna*, *3*(2), 244. https://doi.org/10.28918/alsinatuna.v3i2.1276

Amartha Raqzitya, F., Agung, A., & Agung, G. (2022). E-Modul Berbasis Pendidikan Karakter Sebagai Sumber Belajar IPA Siswa Kelas VII. *Jurnal Edutech Undiksha*, *10*(1), 108–116.

Amin, S. (2019). Peningkatan Profesionalisme Guru melalui Pelatihan Pengembangan Media Pembelajaran Sparkol Videoscribe di Kabupaten Malang. *Jurnal Pengabdian Pada Masyarakat*, *4*(4), 563–572. https://doi.org/10.30653/002.201944.238

Antari, P. L., Widiana, I. W., & Wibawa, I. M. C. (2023). Modul Elektronik Berbasis Project Based Learning Pembelajaran IPAS untuk Meningkatkan Hasil Belajar Siswa Sekolah Dasar. *Jurnal Imiah Pendidikan Dan Pembelajaran*, *7*(2), 266–275. https://doi.org/10.23887/jipp.v7i2.60236

Arabloo, P., Hemmati, F., Rouhi, A., & Khodabandeh, F. (2022). Publisher: Imam Khomeini International University 126. *Journal of Modern Research in English Language Studies*, *9*(1), 125–150. https://doi.org/10.30479/jmrels.2020.14077.1730

Arviansyah, M. R., & Safitri, S. (2022). Pengaruh Media Pembelajaran Terhadap Proses Belajar Mengajar di Masa Pandemi Covid-19. *Khazanah Pendidikan: Jurnal Ilmiah Kependidikan*, *16*(2), 49–54. https://doi.org/10.30595/jkp.v16i2.13383

Arviansyah, M. R., & Shagena, A. (2022). 1803-Article_Text-5370-1-10-20220705. *Efektivitas Dan Peran Dari Guru Dalam Kurikulum Merdeka Belajar*, *17*(1), 40–50.

Bawamenewi, A. (2019). Pengembangan Bahan Ajar Memprafrasekan Puisi "Aku" Berdasarkan Model Pembelajaran Problem Based Learning (Pbl). *Jurnal Review Pendidikan Dan Pengajaran*, *2*(2), 310–323. https://doi.org/10.31004/jrpp.v2i2.631

Cahyati, S. S., Tukiyo, T., Saputra, N., Julyanthry, J., & Herman, H. (2022). How to Improve the Quality of Learning for Early Childhood? An Implementation of Education Management in the Industrial Revolution Era 4.0. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(5), 5437–5446. https://doi.org/10.31004/obsesi.v6i5.2979

Crisianita, S., & Mandasari, B. (2022). the Use of Small-Group Discussion To Improve Students' Speaking Skill. *Journal of English Language Teaching and Learning*, *3*(1), 61–66. https://doi.org/10.33365/jeltl.v3i1.1680

Dua Dhiu, K., & Ngurah Laba Laksana, D. (2021). The Aspects Of Child Development On Early Childhood Education Curriculum. *Journal of Education Technology*, *1*(1), 1–7.

Duszenko, M., Fröhlich, N., Kaupp, A., & Garaschuk, O. (2022). All-digital training course in neurophysiology: lessons learned from the COVID-19 pandemic. *BMC Medical Education*, *22*(1), 1–14. https://doi.org/10.1186/s12909-021-03062-3

Eka D, S. S., Syarifuddin, S., & Oktarina, S. (2023). Needs Analysis of Digital-Based History Learning Resources in Senior High School. *AL-ISHLAH: Jurnal Pendidikan*, *15*(1), 307–318. https://doi.org/10.35445/alishlah.v15i1.2335

Erdi, P. N., & Padwa, T. R. (2021). Penggunaan E-Modul Dengan Sistem Project Based Learning. *JAVIT : Jurnal Vokasi Informatika*, *1*(1), 23–27. https://doi.org/10.24036/javit.v1i1.13

Ernawati, T., & Susanti, S. (2021). E-Modul IPA 2 untuk Pembelajaran Mandiri di Masa Pandemi Covid-19. *KoPeN: Konferensi Pendidikan Nasional*, *3*(1), 107–114. http://ejurnal.mercubuana-yogya.ac.id/index.php/Prosiding_KoPeN/article/view/1658

Fahmi, Fajeriadi, H., Irhasyuarna, Y., Suryajaya, & Abdullah. (2021). The practicality of natural science learning devices on the concept of environmental pollution with problem-solving learning models. *Journal of Physics: Conference Series*, *2104*(1). https://doi.org/10.1088/1742-6596/2104/1/012025

Fulcher, G. (2012). Assessment literacy for the language classroom. *Language Assessment Quarterly*, *9*(2), 113–132. https://doi.org/10.1080/15434303.2011.642041

Guiamalon, T. S., Alon, S. A. S., & Camsa, S. U. (2021). Teachers' Issues and Concerns on the Use of Modular Learning Modality. *IJASOS- International E-Journal of Advances in Social Sciences*, *VII*(20), 457–469. https://doi.org/10.18769/ijasos.970927

He, W., Zhang, Z. (Justin), & Li, W. (2021). Information technology solutions, challenges, and suggestions for tackling the COVID-19 pandemic. *International Journal of Information Management*, *57*(1). https://doi.org/10.1016/j.ijinfomgt.2020.102287

Herwina, R., Husnita, L., & Junaidi, J. K. (2023). Pengembangan E-Modul Berbantuan Sigil Software Pada Mata Pelajaran Sejarah di Tingkat SMA. *Jurnal Pendidikan Tambusai*, *7*(3), 20292–20300.

Kalimullina, O., Tarman, B., & Stepanova, I. (2021). Education in the context of digitalization and culture: Evolution of the teacher's role, pre-pandemic overview. *Journal of Ethnic and Cultural Studies*, *8*(1), 226–238. https://doi.org/10.29333/ejecs/629

Kalolo, J. F. (2019). Digital revolution and its impact on education systems in developing countries. *Education and Information Technologies*, *24*(1), 345–358. https://doi.org/10.1007/s10639-018-9778-3

Keleşzade, G., Güneyli, A., & Özkul, A. E. (2018). Effectiveness of history teaching based on social constructivist learning and development of historical thinking skills. *Education and Science*, *43*(195), 167–191. https://doi.org/10.15390/EB.2018.7479

Khozaei, S. A., Zare, N. V., Moneghi, H. K., Sadeghi, T., & Taraghdar, M. M. (2022). Effects of quantum-learning and conventional teaching methods on learning

achievement, motivation to learn, and retention among nursing students during critical care nursing education. *Smart Learning Environments*, *9*(1). https://doi.org/10.1186/s40561-022-00198-7

Kurniawati, M. W., Anitah, S., & Suharno, S. (2017). Developing Learning Science Teaching Materials Based on Scientific to Improve Student Learning Outcome in Elementary School. *European Journal of Education Studies*, *3*(4), 319–330. https://doi.org/10.5281/zenodo.398991

Lin, K. Y., Wu, Y. T., Hsu, Y. T., & Williams, P. J. (2021). Effects of infusing the engineering design process into STEM project-based learning to develop preservice technology teachers' engineering design thinking. *International Journal of STEM Education*, *8*(1), 1–15. https://doi.org/10.1186/s40594-020-00258-9

Linzalone, R., Schiuma, G., & Ammirato, S. (2020). Connecting universities with entrepreneurship through digital learning platform: functional requirements and education-based knowledge exchange activities. *International Journal of Entrepreneurial Behaviour and Research*, *26*(7), 1525–1545. https://doi.org/10.1108/IJEBR-07-2019-0434

Liu, Z. Y., Lomovtseva, N., & Korobeynikova, E. (2020). Online learning platforms: Reconstructing modern higher education. *International Journal of Emerging Technologies in Learning*, *15*(13), 4–21. https://doi.org/10.3991/ijet.v15i13.14645

Magdalena, I., Sundari, T., Nurkamilah, S., Nasrullah, & Ayu Amalia, D. (2020). Analisis Bahan Ajar. *Nusantara: Jurnal Pendidikan Dan Ilmu Sosial*, *2*(2), 311–326. https://ejournal.stitpn.ac.id/index.php/nusantara

Mahsup, Fitriani, E., & Ibrahim. (2023). Pengembangan E-Modul Berbasis Metode Penemuan untuk Meningkatkan Pemahaman Belajar Mahasiswa. *Paedagoria : Jurnal Kajian, Penelitian Dan Pengembangan Kependidikan*, *14*(4), 515–520.

Malahilla, A., Nizar, M., Haifaturrahmah, Najamudin, & Nagy, E. K. (2023). Developing Sasak ethnicity comic character-based student worksheets to improve students' critical thinking skills. *JINoP (Jurnal Inovasi Pembelajaran)*, *9*(2), 154–164. https://doi.org/10.22219/jinop.v1i1.2441

Malicka, A., Gilabert Guerrero, R., & Norris, J. M. (2019). From needs analysis to task design: Insights from an English for specific purposes context. *Language Teaching Research*, *23*(1), 78–106. https://doi.org/10.1177/1362168817714278

Minamatov, Y. E. ugli, & Turobova, R. R. (2021). Application Of Modular Teaching Technology In Technology. *Scientific Progress*, *2*(8), 911–913.

Nikou, S. A., & Economides, A. A. (2018). Mobile-Based Micro-Learning and Assessment.pdf. *Journal of Computer Assisted Learning*, *34*(3), 269–278.

Noeryanti, A. T., & Rejekiningsih, T. (2023). Learning Innovation through the Development of Interactive Multimedia Based on Local Wisdom for Sociology Learning in the Digital Era. *Jurnal Edutech Undiksha*, *11*(1), 41–53. https://ejournal.undiksha.ac.id/index.php/JEU/article/view/60441%0Ahttps://ejournal.undiksha.ac.id/index.php/JEU/article/download/60441/26944

Oksa, S., & Soenarto, S. (2020). Pengembangan E-Modul Berbasis Proyek Untuk Memotivasi Belajar Siswa Sekolah Kejuruan. *Jurnal Kependidikan*, *4*(1), 99–111.

Oktari, M. (2021). *Oktari, Mela. (2021). Pengembangan Modul Elektronik Berbasis 3D*

Pageflip pada Mata Pelajaran Sejarah Kelas X SMA Negeri 1 Tanjung Raja.

Onishchuk, I., Ikonnikova, M., Antonenko, T., Kharchenko, I., Shestakova, S., Kuzmenko, N., & Maksymchuk, B. (2020). Characteristics of Foreign Language Education in Foreign Countries and Ways of Applying Foreign Experience in Pedagogical Universities of Ukraine. *Revista Romaneasca Pentru Educatie Multidimensionala*, *12*(3), 44–65. https://doi.org/10.18662/rrem/12.3/308

Osman, N., Hamzah, M. I., Rouyan, N. M., & Noor, S. S. M. (2021). Formative Evaluation of Arabic Language Modules Based on Blended Learning. *International Journal of Academic Research in Progressive Education and Development*, *10*(3), 1339–1348. https://doi.org/10.6007/ijarped/v10-i3/11464

Prahani, B. K., Limatahu, I., Soegimin, Yuanita, W. W., & Nur, M. (2016). Effectiveness of Physics Learning Material Through Guided Inquiry Model To Improve Student's Problem-Solving Skills Based on Multiple Representation. *International Journal of Education and Research*, *4*(12), 231–242.

Prucha, B., Graham, D., Watson, M., Avenant, M., Esterhuyse, S., Joubert, A., Kemp, M., King, J., Roux, P. le, Redelinghuys, N., Rossouw, L., & Rowntree, K. (2016). MIKE-SHE integrated groundwater and surface water model used to simulate scenario hydrology for input to DRIFT-ARID: the Mokolo River case study. *Creative Commons Attribution License*, *42*(3), 384–398. https://doi.org/http://dx.doi.org/10.4314/wsa.v42i3.03

Putri, S. D., & Syarifuddin, S. (2023). Development of Interactive E-Module on Biye Tradition to Improve Students' Learning Outcomes. *Proceeding of the 3rd International Conference on Social Knowledge Sciences and Education (ICSKSE)*, 289–302. https://doi.org/10.2991/978-2-38476-168-5_26

Rawashdeh, A. Z. Al, Mohammed, E. Y., Arab, A. R. Al, Alara, M., & Al-Rawashdeh, B. (2021). Advantages and disadvantages of using E-learning in university education: Analyzing students' perspectives. *Electronic Journal of E-Learning*, *19*(2), 107–117. https://doi.org/10.34190/ejel.19.3.2168

Siti, A., Agnia, G. N., Furnamasari, Y. F., & Dewi, D. A. (2021). Pengaruh Kemajuan Teknologi terhadap Pembentukan Karakter Siswa. *Jurnal Pendidikan Tambusai*, *5*(3), 9331–9335. https://www.jptam.org/index.php/jptam/article/view/2473

Sukmawati, H. (2021). Komponen-komponen kurikulum dalam sistem pembelajaran. *Ash-Shahabah : Jurnal Pendidikan Dan Studi Islam*, *7*(1), 62–70.

Susanti, S., & Chairunisa, E. D. (2020). Pengembangan E-Modul Pembelajaran Sejarah Tokoh-Tokoh Pembangunan Pacsa Kemerdekaan Di Sumatera Selatan. *Kalpataru: Jurnal Sejarah Dan Pembelajaran Sejarah*, *6*(2), 110–113. https://doi.org/10.31851/kalpataru.v6i2.5255

Syakura, V. H., & Tawardjono Us. (2017). Pengembangan multimedia pembelajaran sistem kopling bidang keahlian Teknik Kendaraan Ringan SMK Muhammadiyah 3 Yogyakarta. *E-Jurnal Pendidikan Teknik Otomotif - S1*, *18*(2), 131–137. http://journal.student.uny.ac.id/ojs/index.php/otomotif-s1/article/view/10133

Tafakur, Retnawati, H., & Shukri, A. A. M. (2023). Effectiveness of project-based learning for enhancing students critical thinking skills: A meta-analysis. *JINoP*

(Jurnal Inovasi Pembelajaran), *9*(2), 191–209. https://doi.org/10.22219/jinop.v1i1.2441

Ulfah, Supriani, Y., & Arifudin, O. (2022). Kepemimpinan Pendidikan di Era Disrupsi. *JIIP-Jurnal Ilmiah Ilmu Pendidikan*, *5*(1), 153–161.

Usman, Fakhruddin, Z., Hardiyanti, Adam, Z., Kadaruddin, & Rahmani, B. (2023). Developing EFL teachers' competence in designing learning materials through electronic English book design training. *JINoP (Jurnal Inovasi Pembelajaran)*, *9*(2), 140–153. https://doi.org/10.22219/jinop.v1i1.2441

van Boxtel, C., & van Drie, J. (2018). Historical Reasoning: Conceptualizations and Educational Applications. *The Wiley International Handbook of History Teaching and Learning*, 149–176. https://doi.org/10.1002/9781119100812.ch6

Vesin, B., Mangaroska, K., & Giannakos, M. (2018). Learning in smart environments: user-centered design and analytics of an adaptive learning system. *Smart Learning Environments*, *5*(1). https://doi.org/10.1186/s40561-018-0071-0

Z.Yu, A. (2022). The Role Of Modern Pedagogical Technologies In Improving The Quality Of The Educational Process. *Экономика и Социум*, *94*(2), 12–16. www.aging-us.com