

Online learning videos to develop creative thinking skills of students

Mila Ermila Hendriyani ^{a,1}, Ika Rifqiawati ^{a,2}, Diana Lestari ^{a,3,*}

^a Biology Education Study Program, Faculty of Teacher Training and Education, Sultan Ageng Tirtayasa University, Jl. Raya Palka KM 3 Sindangsari, Serang, Banten 42124, Indonesia

¹ mila.hendriyani@gmail.com; ² ikarifqiawati@untirta.ac.id; ³ dianalstr99@gmail.com *

* Corresponding author

Abstract: Creative thinking skills are 21st Century Skills which are difficult to improve when online learning is implemented. This study aimed to develop online learning videos to improve students' creative thinking skills. The product development process includes problem analysis, material collection, product design, expert test, limited trial, design revision, usage trial, and product revision. The material and design determine the feasibility of the product. Aspects of material assessment include conformity to the curriculum, indicators of creative thinking, and language. Elements of the assessment in terms of media include instructional design, visual communication, and aspects of creative thinking. The validation results show the average percentage of material experts is 97.55%, and media experts is 93.7%. The results of the user response test (teachers and students) were 99.76%. This value shows that online learning videos were included in the very appropriate category as learning media to improve students' creative thinking skills on the material of the circulatory system. Therefore, the media that has been developed in this study is expected to be followed up in further research and applied in biology learning.

Keywords: circulatory system; creative thinking skills; online learning videos

Citation: Hendriyani, M. E., Rifqiawati, I., & Lestari, D. (2022). Online learning videos to develop creative thinking skills of students. *Research and Development in Education (RaDEn)*, 2(2), 67-75. <https://doi.org/10.22219/raden.v2i2.20035>

Received: 31 January 2022

Revised: 13 July 2022

Accepted: 11 December 2022

Published: 12 December 2022



Copyright © 2022, Hendriyani et al.

This is an open access article under the CC-BY-SA license

1. Introduction

The learning process requires students to have thinking skills. One of the thinking skills that students must have is creative thinking skills (Chakra, 2016; Mumford et al., 2012). Creative thinking directs students to be imaginative, think inventive, come up with new ideas, and think out of the box (Glăveanu, 2014). Given the importance of these thinking skills, critical thinking skills are included in the 21st Century skills that must be mastered by students (Alismail & McGuire, 2015; Binkley et al., 2012).

On the other hand, since the end of 2019, the world has been attacked by COVID-19 that has caused a global pandemic. The Covid-19 pandemic required people to stay at home, keep their distance, wear masks, and wash their hands to reduce the spread of the virus. The Covid-19 pandemic has an impact on health problems. In addition, it affects the education aspect (Burki, 2020; Sparrow et al., 2020; Xie et al., 2020). During pandemic, the learning process shifts from the face-to-face learning process to online distance learning or online learning (García-Peñalvo et al., 2021; Moorhouse, 2020; Qazi et al., 2020). This condition is a challenge for teachers in Indonesia and other countries (Adedoyin & Soykan, 2020; Cutri et al., 2020; Leader et al., 2021; Qonita et al., 2021; Rannastu-Avalos & Siiman, 2020; Yusuf, 2020). Teachers must be more creative in delivering the material to achieve the learning objectives well (Dick et al., 2020; Mhlanga & Moloi, 2020). However, in fact, in the learning process, the teacher only provides teaching materials and assignments. This result follows the questionnaire results, which states that in online learning, 58% of teachers only offer material in the form of *power points*, modules, and teaching materials, not to develop the thinking skills that students must possess.

Media is one of the supports in online learning. The media is very influential on the learning process because the success or failure of the learning process is determined by the media used. One learning media that can support online learning and develop students' creative thinking skills is video learning. Video media can increase student participation, generate student learning creativity, help students improve understanding, and create more effective and efficient communication. Alternative online learning videos are expected to help students have creative thinking skills in biology learning, especially on the material of the circulatory system.

The circulation system is a difficult topic for students to learn (Çimer, 2012). The circulatory system is an abstract material (Fauzi et al., 2021). This material cannot be studied directly by students with the naked eye, mainly just by reading textbooks, so this material is difficult for students to understand. This result follows the questionnaire results, which stated that as many as 18% of students had difficulty digesting the material of the circulatory system. For that, learning videos to visualize the material and help students repeat the material anytime and anywhere is needed. Using learning videos as online learning media is considered sufficient to seize students' attention in learning from home. Students are interested or the emergence of learning motivation in students, so students will find it easier to learn.

Several studies have attempted to develop video as a medium for learning biology. Some studies do not analyze the effectiveness of videos to improve certain competencies (Fajar et al., 2022; Muliana, 2022; Varisa & Fikri, 2022). Several others have attempted to analyze the effectiveness of video on several competencies, such as student attitudes (Shabrina & Dewi, 2020) and learning outcomes (Handayani et al., 2021). However, development research that develops video media to improve thinking skills in biology lessons is still difficult to find. Therefore, the purpose of this research was to develop learning videos to improve students' critical thinking skills.

2. Materials and Methods

Research Design

This research was conducted from November 2020 to June 2021 at Sultan Ageng Tirtayasa University and MAN 1 Tangerang. This Research and Development (R&D) study using a development model according to Sugiyono, which consists of stages of potential problems, data collection, product design, design validation, product trial/test, limited trials, product revisions, usage trials, and product revisions (Sugiyono, 2016).

Problem Analysis

The first step was problem analysis. At this stage, the concept and type of media will be determined based on the data taken from the needs analysis by distributing questionnaires to 10 teachers and 50 students in class XI, which are taken randomly. First, the questionnaires were distributed to find out what kind of learning video information is effectively used in online learning, to find out more clearly what obstacles teachers and students face in online learning, and what materials are complex for students to understand online learning. After that, a curriculum analysis was carried out to obtain research supporting information based on the applicable curriculum. Then, an analysis of the essential material on the circulatory system material was carried out by distributing questionnaires to 10 biology teachers and 10 class XI students who were taken randomly so that the material in this online learning video is essential and follows the needs in the field.

Material Collection

Material and data collection is following the concept and learning video that has been determined based on a needs analysis. The data was in materials, images, videos, and applications used.

Product Design

Based on the needs analysis, the next step in research and development is to design the product to be developed. At this stage, the design was carried out flowchart and storyboard. Flow cards were developed to see the flow of making learning videos in general,

while storyboards were designed to visualize the product for function and logic designs using scenarios.

Expert Test

The validation/expert test phase was carried out to assess the feasibility of the media to be used in the biology learning process in schools. Several experienced experts carry out this stage to evaluate the new product design. Experts in design validation include two materials experts and two media experts. Each expert is asked to rate the product to identify the advantages and disadvantages. Material experts have qualifications as university lecturers in the field of biology studies. Media expert qualifications include having knowledge, skills, and experience in understanding media characteristics. In this study, media experts, namely lecturers, have capabilities in learning media.

Limited Trial

Limited trial conducted in schools with real students in the form of simulation activity in operationalizing the learning program plan in the classroom using online learning videos. The online learning videos used have undergone revisions from material experts and media experts. It aims to determine the response of users (teachers and students) in the use of online learning videos using a scale assessment questionnaire Guttman. The subject of the limited trial was carried out on one biology teacher and ten students of class XI science because, according to Arikunto small group trials were carried out on 4-14 respondents and for large groups between 15-50 respondents (Arikunto, 2013). The biology subject teacher chose the test subjects from the students to avoid the subjective influence of the researcher.

Product Revision

Based on the research results from experts and response tests users (teachers and students), all the advantages and disadvantages of learning videos can be seen for further revision of the product design.

Final

The final product was "Online Learning Videos to Develop Students' Creative Thinking Skills," validated, simulated or limited trials, and revised.

Research Subjects

In a study, the research subject has a very strategic role because the research subject is data about the variables that the research observes. In research on the development of online learning videos to develop students' creative thinking skills with research subjects consisting of two material experts, two media experts, and users (teachers and students).

Data Collection Techniques and Types of Instruments

The data collection technique in this study was the non-test technique. The data generated comes from needs analysis and media feasibility analysis. The needs analysis results come from primary data (giving closed questionnaires to a sample of teachers and students) and secondary data (through literature study). The results of the media feasibility analysis come from a media feasibility assessment by a team of experts and users (teachers and students). The following are the various types of instruments used in this study: (1) Needs analysis questionnaire to 10 biology teachers and 50 class XI students taken at random. This questionnaire was filled out to find out information about the media used for online learning, videos used for online learning, obstacles in online learning, and materials that are difficult to understand in online learning. (2) The media assessment sheet is used to assess the feasibility of the learning media made. This assessment sheet was given to a team of experts, two material experts, and two media experts. (3) Response limited assessment sheet (teachers and students) was used to assess the quality of online learning videos by teachers and students.

Data Management Techniques

The data processing technique used in this study was data processing on the expert and test assessment instruments user (students and teachers) on online learning videos

assessed based on the scores listed in the questionnaire using the scale Guttman with modifications. First, Guttman's scale by adding a note to the agreed answer. So that on the scale Guttman with changes into three categories of assessment.

Processing of data from the expert team's

Assessment the quality of the assessment instrument by the online learning video expert team will be assessed based on two aspects: the feasibility of the material and the feasibility of the learning media.

Instrument in a closed questionnaire was used to determine the eligibility category and quality of online learning videos. The research instrument was a checklist containing feasibility and quality assessment of online learning videos. Table 1 inform the scoring for evaluating the feasibility and quality of online learning videos.

Table 1. Criteria for assessing the feasibility and quality of online learning videos to develop students' creative thinking skills.

Rating Score	Score
Do not Agree	1
Agree with note	2
Agree without note	3

The following are the steps of data processing carried out on the assessment of the expert test instrument: a) The percentage value of each aspect of the criteria can be calculated using the formula 1 based on Purwanto (Purwanto, 2013). In formula 1, NP is the percent value sought or expected, R is the row score obtained, and SM is the maximum ideal score.; and b) The percentage value obtained is then converted into a qualitative value according to the criteria for the assessment category can be seen from Table 2.

$$P(\%) = \frac{R}{SM} \times 100 \dots\dots\dots\text{formula 1}$$

Table 2. Criteria for the ideal assessment category

Score (%)	Level of Eligibility
81-100	Very worthy
61-80	worthy
41-60	Enough
21-40	Less
0-20	Not

Data processing of the results of the limited response test (teachers and students)

In response assessment instrument (teachers and students), online learning videos are assessed for quality based on four criteria: an interest in videos, mastery of the material, appearance, and implementation.

When determining the category of responses users (teachers and students) to online learning videos, an instrument in a closed questionnaire is used. This research instrument is in the form of a sheet checklist. The determination of the score for the assessment of responses users (teachers and students) to online learning videos can be seen in Table 1. In processing the data from the limited test results of the user of the response (teachers and students), the steps and criteria for the category of assessment of responses user (teachers and students) are the same as on the expert test assessment instrument (Table 2).

Storyboard

This video was packaged in a short film that will explain the material that comes from the problems. For example, there are two problems in this video: why after running or exercising, the heart beats faster than usual and the myth or fact that consuming too

much salty food can cause high blood pressure. This will describe the video content that will be developed starting from the board, video visualization and script, aspects of creative thinking that can be developed, and time.

3. Results

Problem analysis is the first step taken by researchers. Based on the results of observations of the learning process carried out by researchers, it shows that the learning process is hampered due to the COVID-19 pandemic, and students feel bored when learning activities are carried out online.

The product resulting from this research is an online learning video to improve creative thinking skills. This online learning video contains various multimedia aspects that increase student activity and involvement in learning activities, including a combination of stories/scenarios, audio, animation, images, and text. Furthermore, this online learning video emphasizes the process of active student involvement and flexible and efficient student independent learning activities so that students can be motivated to always study anytime and anywhere without being adrift of space and time. To view the video of the results of the development of this study, it can be accessed via the barcode in [Figure 1](#).



Figure 1. Barcode to access the developed video

The problem analysis phase was implemented to gather information about the learning process online. This stage includes needs analysis, curriculum analysis, and material analysis. First, a needs analysis was carried out by randomly distributing questionnaires to biology teachers and class XI high school students. Although based on the results of the questionnaire distribution, it is known that in the online learning process, the teacher only provides power points, modules, and teaching materials. The teacher and student questionnaires also state that 100% and 58% of teachers use power points as a medium for online learning.

The material for the circulatory system is the material that will be included in this online learning video; this is based on the results of the questionnaire stating that 18% of students have difficulty digesting the material on the circulatory system. Then a curriculum analysis is carried out, and this activity is carried out so that the media created can help students master the competencies that have been determined.

In material collection phases, circulatory system material as the content or contents of online learning videos becomes the initial data in media development was collected. The material consists of media material (description of the material concept and illustrations) and the need for equipment to develop online learning videos. The online learning video materials was Illustrated videos and pictures that taken from the Youtube Channel of LifeOF Syams and Sobat IPA. The material explains the constituent parts and heart and blood vessels work. This research uses software (Filmorago, Inshoot, and Ms. PowerPoint) and hardware (Laptop and Mobile).

After that, the design and development of media started from developing storyboards, developing research products in the form of online learning videos to develop students' creative thinking skills, product validation by a team of experts, and product design revisions.

The results of the material expert validation for each temporal assessment indicator were obtained to determine the feasibility of the material in the online learning video. The score in each indicator by filling in the material feasibility test instrument. Material experts are shown, the material aspect of the material expert obtained a percentage value of 95.44%. Then, the creative thinking aspect received a percentage value of 97.22%. Finally,

the linguistic aspect got a percentage value of 100%. Next, the average value obtained from the material expert team is 97.55% in the very good category.

The results of media expert validation on each media assessment indicator were obtained to determine the feasibility of online learning videos to develop students' creative thinking skills. Getting a score for each indicator through filling out the media feasibility test instrument conducted by media experts.

The percentage value for the instructional design aspect is 93.33%. Then the visual communication aspect is 93.33%. Finally, aspects of creative thinking media experts obtained a percentage value of 94.44%. Based on the overall media evaluation results from the tests conducted by the media expert team, the overall average score percentage from the expert media team was 93.7%, with a very good category.

Based on the overall percentage from the assessment of material and media experts, about 95.6% of online learning videos to develop students' creative thinking skills are included in the very good category and are worthy of being used as learning media to develop students' creative thinking skills on the material of the human circulatory system. The media have shown great potential in training students' creative thinking skills because in this video already there are aspects of creative thinking. In addition, appropriate learning media must follow the material and learning objectives to be achieved.

Furthermore, online learning videos to improve students' creative thinking skills that have been revised will proceed to the final stage of this research, namely the user response test stage (teachers and students) as media users to 1 teacher and ten students in class XI IPA MAN 1 Tangerang. The teacher's response test results for each media assessment indicator were obtained to determine the teacher's response to online learning videos to develop students' creative thinking skills. The score obtained in each indicator through filling out the media response test instrument carried out by one teacher. The percentage results in all aspects show a value of 100%.

The results of the student response test for each media assessment indicator were obtained to determine student responses to online learning videos to develop students' creative thinking skills. It is getting a score in each indicator by filling out the media response test instrument conducted by ten students are getting 100%. The indicators are eligibility, interest in media, material mastery, and media display.

Based on the user response test (teachers and students), the percentage value of 99.76% is a good medium. Therefore, it can be interpreted that teachers and students accept well the existence of learning videos to develop students' creative thinking skills to use in helping develop students' creative thinking skills and help students understand the material of the circulatory system.

4. Discussion

Video is a suitable medium for various kinds of learning, such as classes, small groups, even one student alone (Smaldino et al., 2019). Furthermore, this result cannot be separated from the current condition of students growing up in the arms of technological culture. Therefore, videos with only a few minutes can provide more flexibility for teachers and direct learning directly to student needs.

In relation to this research, creative thinking skills are a parameter of the effectiveness of the media that has been developed. The choice of this competency is due to creative thinking skills including 21st Century skills that students need to master (Alismail & McGuire, 2015; Binkley et al., 2012; Chakra, 2016; Mumford et al., 2012). With this skill, students can think outside the box when facing problems (Glăveanu, 2014). Creative thinking can be developed in learning through several methods or approaches. In this online learning video, there are already problems that students must solve. Problem-solving-based learning models can also develop creative thinking skills (Cheng, 2010).

Through this video, learning activities for the circulatory system can help students learn online and independently. The results of this study are in accordance with the results of previous studies, such as study in Kudus (Shabrina & Dewi, 2020) and West Lombok

(Handayeni et al., 2021). After watching this online learning video, students will understand the learning material and develop their creative thinking skills. Aspects of creative thinking consist of thinking smoothly (*fluency*) in solving problems, thinking flexibility to produce ideas for solving problems, thinking originality to provide different ideas, and thinking in detail to develop ideas. Through this research, it is hoped that learning videos can be used more optimally as an effort to maximize students' creative thinking skills.

5. Conclusions

This research has developed a learning video on circulation system topic. The results of the expert test analysis showed that the average score from the material expert team was 97.55% and from the expert media team was 93.7%, with a very good media category. The results of the user response test (teachers and students) showed a score of 99.76%. This result means that online learning videos to develop students' creative thinking skills are a good medium for teachers and students to accept online learning videos as suitable media to help develop creative thinking skills.

There are several suggestions for developing this media, namely: (1) research needs to be carried out to extensive testing so that the influence of online learning videos can be seen to develop students' creative thinking skills; (2) it is necessary to add platforms (such as YouTube, Instagram, TikTok, and others) for collecting student reaction so that the wider community can see them; and (3) it is necessary to add assignments and instructions by the teacher so that all competencies on the material of the human circulatory system can be appropriately achieved.

Author Contributions: Methodology, M. E. H., I. R., and D. L.; validation, M. E. H., I. R., and D. L.; analysis, M. E. H., I. R., and D. L.; writing—original draft preparation, M. E. H., I. R., and D. L.; review and editing, M. E. H., I. R., and D. L.

Conflicts of Interest: Authors declare there are no conflicts of interest.

6. References

- Adedoyin, O. B., & Soykan, E. (2020). COVID-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments*, 1–13.
<https://doi.org/10.1080/10494820.2020.1813180>
- Alismail, H. A., & McGuire, P. (2015). 21st Century standards and curriculum: current research and practice. *Journal of Education and Practice*, 6(6), 150–155.
<http://files.eric.ed.gov/fulltext/EJ1083656.pdf>
- Arikunto, S. (2013). *Prosedur penelitian suatu pendekatan praktik*. Rineka cipta.
<https://onsearch.id/Record/IOS7783.ai:slims-19921>
- Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining twenty-first century skills. In P. Griffin, B. McGaw, & E. Care (Eds.), *Assessment and teaching of 21st century skills* (pp. 17–66). Springer. <https://doi.org/10.1007/978-94-007-2324-5>
- Burki, T. K. (2020). COVID-19: Consequences for higher education. *The Lancet Oncology*, 21(6), 758.
[https://doi.org/10.1016/S1470-2045\(20\)30287-4](https://doi.org/10.1016/S1470-2045(20)30287-4)
- Chakra, A. (2016). A life skills approach to adolescent development. *International Journal of Home Science*, 2(1), 234–238.
<https://www.homesciencejournal.com/archives/2016/vol2issue1/PartD/2-1-46-353.pdf>
- Cheng, V. M. Y. (2010). Teaching creative thinking in regular science lessons: Potentials and obstacles of three different approaches in an Asian context. *Asia-Pacific Forum on Science Learning and Teaching*, 11(1), 1–21.
https://www.eduhk.hk/apfslt/download/v11_issue1_files/chengmy.pdf

- Çimer, A. (2012). What makes biology learning difficult and effective: Students' views. *Educational Research and Reviews*, 7(3), 61–71. <https://doi.org/10.5897/ERR11.205>
- Cutri, R. M., Mena, J., & Whiting, E. F. (2020). Faculty readiness for online crisis teaching: transitioning to online teaching during the COVID-19 pandemic. *European Journal of Teacher Education*, 43(4), 523–541. <https://doi.org/10.1080/02619768.2020.1815702>
- Dick, G., Akbulut, A. Y., & Matta, V. (2020). Teaching and learning transformation in the time of the Coronavirus crisis. *Journal of Information Technology Case and Application Research*, 22(4), 243–255. <https://doi.org/10.1080/15228053.2020.1861420>
- Fajar, N., Lestari, I. N., Rizki, Nurlaila, & Haviz, M. (2022). Validity of media video blog via youtube on human skeletal system material. *AIP Conference Proceedings*, 030004. <https://doi.org/10.1063/5.0112335>
- Fauzi, A., Rosyida, A. M., Rohma, M., & Khoiroh, D. (2021). The difficulty index of biology topics in Indonesian senior high school: Biology undergraduate students' perspectives. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, 7(2), 149–158. <https://doi.org/10.22219/jpbi.v7i2.16538>
- García-Peñalvo, F. J., Corell, A., Abella-García, V., & Grande-de-Prado, M. (2021). Recommendations for mandatory online assessment in higher education during the COVID-19 pandemic. In D. Burgos, A. Tlili, & A. Tabacco (Eds.), *Radical Solutions for Education in a Crisis Context. Lecture Notes in Educational Technology* (pp. 85–98). https://doi.org/10.1007/978-981-15-7869-4_6
- Glăveanu, V. P. (2014). *Distributed creativity*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-05434-6>
- Handayani, T., Artayasa, I. P., & Rasmi, D. A. C. (2021). Developing online learning video based on the science technology society (STS) to improve biology learning outcomes. *Jurnal Pijar Mipa*, 16(4), 473–478. <https://doi.org/10.29303/jpm.v16i4.2794>
- Leader, A. E., Capparella, L. M., Waldman, L. B., Cammy, R. B., Petok, A. R., Dean, R., Shimada, A., Yocavitch, L., Rising, K. L., Garber, G. D., Worster, B., & Dicker, A. P. (2021). Digital Literacy at an Urban Cancer Center: Implications for Technology Use and Vulnerable Patients. *JCO Clinical Cancer Informatics*, 5(5), 872–880. <https://doi.org/10.1200/CCI.21.00039>
- Mhlanga, D., & Moloi, T. (2020). COVID-19 and the digital transformation of education: What are we learning on 4IR in South Africa? *Education Sciences*, 10(7), 180. <https://doi.org/10.3390/educsci10070180>
- Moorhouse, B. L. (2020). Adaptations to a face-to-face initial teacher education course 'forced' online due to the COVID-19 pandemic. *Journal of Education for Teaching*, 609–611. <https://doi.org/10.1080/02607476.2020.1755205>
- Muliana, G. H. (2022). Development of biology learning media video tutorial. *Budapest International Research and Critics Institute ...*, 5(4), 29764–29770. <https://doi.org/10.33258/birci.v5i4.7131.29764>
- Mumford, M. D., Medeiros, K. E., & Partlow, P. J. (2012). Creative thinking: Processes, strategies, and knowledge. *Journal of Creative Behavior*, 46(1), 30–47. <https://doi.org/10.1002/jocb.003>
- Purwanto, M. (2013). *Prinsip-prinsip dan teknik evaluasi pembelajaran*. Remaja Rosdakarya. <https://opac.perpusnas.go.id/DetailOpac.aspx?id=647732>
- Qazi, A., Naseer, K., Qazi, J., AlSalman, H., Naseem, U., Yang, S., Hardaker, G., & Gumaei, A. (2020). Conventional to online education during COVID-19 pandemic: Do develop and underdeveloped nations cope alike. *Children and Youth Services Review*, 119, 105582.

<https://doi.org/10.1016/j.chilyouth.2020.105582>

- Qonita, R., A'tourrohman, M., Ulwiyah, U., & Wijayanti, E. (2021). Student learning difficulties in online biochemistry practicum: An experiences during COVID-19. *Bioeduscience*, 5(1), 74–79. <https://doi.org/10.22236/j.bes/515597>
- Rannastu-Avalos, M., & Siiman, L. A. (2020). Challenges for distance learning and online collaboration in the time of COVID-19: Interviews with science teachers. In A. Nolte, C. Alvarez, R. Hishiyama, I. A. Chounta, M. Rodríguez-Triana, & T. Inoue (Eds.), *Collaboration Technologies and Social Computing* (pp. 128–142). Springer. https://doi.org/10.1007/978-3-030-58157-2_9
- Shabrina, K. L. N., & Dewi, N. K. (2020). The video effectiveness based on ethnobiology in Komodo Island as the Learning Media of PLH. *Journal of Biology Education*, 9(3), 275–282. <https://doi.org/10.15294/jbe.v9i3.39255>
- Smaldino, S., Lowther, D., Mims, C., & Russell, J. (2019). *Instructional technology and media for learning*. Pearson. https://books.google.co.id/books/about/Instructional_Technology_Media_For_Learn.html?hl=id&id=opk-DwAAQBAJ&redir_esc=y
- Sparrow, R., Dartanto, T., & Hartwig, R. (2020). Indonesia under the new normal: Challenges and the way ahead. *Bulletin of Indonesian Economic Studies*, 56(3), 269–299. <https://doi.org/10.1080/00074918.2020.1854079>
- Sugiyono. (2016). *Metode penelitian pendidikan (Pendekatan kuantitatif, kualitatif, dan R&D)*. Alfabeta. <http://pustaka.unm.ac.id/opac/detail-opac?id=35458>
- Varisa, N., & Fikri, A. A. (2022). Development of biology learning media based on video blogs (vlog) on environmental change topic. *Research and Development in Education*, 2(1), 33–39. <https://doi.org/10.22219/raden.v2i1.22056>
- Xie, X., Siau, K., & Nah, F. F. H. (2020). COVID-19 pandemic–online education in the new normal and the next normal. *Journal of Information Technology Case and Application Research*, 22(3), 175–187. <https://doi.org/10.1080/15228053.2020.1824884>
- Yusuf, B. N. (2020). Are we prepared enough? A case study of challenges in online learning in a private higher learning institution during the COVID-19 outbreaks. *Advances in Social Sciences Research Journal*, 7(5), 205–212. <https://doi.org/10.14738/assrj.75.8211>