

Interactive Learning Media Development using Articulate Storyline in Fundamentals of Electric Power Engineering

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Article Information

Article history:

No. 695

Rec. September 22, 2022

Rev. November 22, 2022

Acc. Januari 31, 2023

Pub. Februari 08, 2023

Page. 51 – 63

Keywords:

- Articulate Storyline
- Basic Electrical Engineering
- Interactive Learning Media

ABSTRACT

Interactive learning media is a teaching material that is needed as an intermediary information that can directly interact with students so it can be easily learned independently. This research aims to produce a valid and practical interactive learning media in the subject of Basic Electrical Engineering using Articulate Storyline at SMK Negeri 2 Lubuk Basung. The type of research used is R&D (Research & Development) with a 4-D development model that goes through four main procedures: (1) Define, (2) Design, (3) Development, and (4) Disseminate. This learning media was tested by media experts, subject matter experts, teachers, and students at SMK Negeri 2 Lubuk Basung. The results of the media expert assessment were 0.89 (valid), subject matter expert 0.87 (valid), practicality test by teachers 91% (very practical), and practicality test by students of SMKN 2 Lubuk Basung obtained 91% (very practical). Based on the assessment results, it shows that the interactive learning media with a clear storyline on the basic electrical engineering topics is very good and practical to use in learning activities at SMK (vocational high school).

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1. INTRODUCTION

The Covid-19 pandemic has had a significant impact on various aspects of life, including health, economy, society, and even education[1]. One of the most profound impacts on the education sector is the shift from face-to-face learning to distance learning, also known as online learning [2]. The implementation of online learning is aimed at achieving physical distancing, which requires physical restrictions. This certainly restricts physical activity space. This policy was taken by the government in an effort to prevent the spread of the Covid-19 virus on a larger scale, especially in the educational environment[3][4]–[6].

The shift from face-to-face learning to online learning certainly presents new problems in schools, especially at SMK Negeri 2 Lubuk Basung. Based on observations from the researcher during Practical Field Education (PLK) during the pandemic, the biggest problem experienced by both teachers and PLK researchers is the limited availability of digital learning materials for the existing subjects. This is because there are still some teachers at SMK who have difficulty using applications to develop digital learning materials, especially for the subject of Basic Electrical Engineering.

Basic Electrical Engineering is a required course for students in grade X. The current media is not interactive, and the learning media used by the teacher for Basic Electrical Engineering is in the form of PDF file media only. Based on interviews with teachers at SMK Negeri 2 Lubuk Basung regarding the implementation of online learning in Basic Electrical Engineering, the teacher conveys the material and questions through WhatsApp, Google Classroom, material in the form of a PDF file, and then students are asked to read and understand, and then students do the questions sent by the teacher through these applications [7]. Then the questions that have been completed by students are sent back to the teacher through private chat. Learning that is only focused on self-reading will result in most students getting bored and eventually not very interested and not understanding the material, because there is no stimulation and evaluation of their own understanding [8], [9]. Yet learning media is one of the important elements as a support source for achieving learning goals.

Learning media itself is a teaching aid that influences the climate, conditions and learning environment created by the teacher [10]. The right choice of learning media will result in better learning outcomes and processes. Therefore, using the right learning media in the learning process can help achieve effective interaction between educators and students, especially in the delivery of learning materials. The use of learning media in the teaching and learning process can awaken the desire, interest, motivation and stimulation of learning, even bring psychological influences to students [11]. In the teaching and learning process, the teacher has a duty to encourage, guide and provide learning facilities for students to achieve the goal. The role of media is very important to help the teacher in achieving the goal [7], [11], [12].

Given this background, the researcher wants to develop the teacher's teaching media, which previously was a PDF file, into an interactive learning media using the Articulate Storyline application, in order to improve the quality of the material to be delivered and attract students' interest in learning independently, so that it can ultimately improve students' learning outcomes [13], [14]. The advantage of Articulate Storyline is its simple smart browser with interactive tutorial procedures through templates that can be published both offline and online, and Articulate Storyline is also multimedia-based, which is a combination of various media (file formats) such as text, images, graphics, sound, animation, video, interaction, and others that have been packaged into digital files (computerized) can make learning more interesting. In addition, with Articulate Storyline,

the developed learning media also has an interactive quiz feature so that students can self-evaluate their learning while at home.

2. RESEARCH METHOD

The research model used is the Research and Development (R&D) method [15]. The R&D method is a research method used to produce a specific product and test its effectiveness. The research and development methodology in the field of educational technology is related to product development and design problems, especially media, teaching materials, and learning systems. We know that educational technology can be defined as the theory and practice of design, development, utilization, management, and evaluation of resources for learning. Therefore, this method is chosen because it aims to develop learning media that is suitable for the needs of learners.

The Research and Development (R&D) method has a scope in the research process. Research and Development is divided into four levels [16]:

Level 1: Researching without making and testing the product.

Level 2: Testing existing products without research.

Level 3: Researching and developing existing products.

Level 4: Researching and creating new products.

However, the ten steps of Research & Development in research, as described by Sugiyono, are (Fig.1):

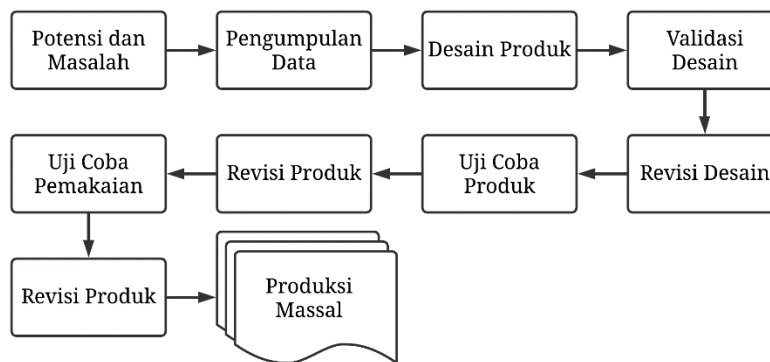


Figure 1. the ten steps of Research & Development in research

The development model that will be used in this research is the 4-D (Four D) model. Developed by Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel (1974), the 4-D research method is an acronym for four stages of research, Define, Design, Develop, and

Disseminate. The steps of this research are carried out step by step, so it can be seen based on the following flow:

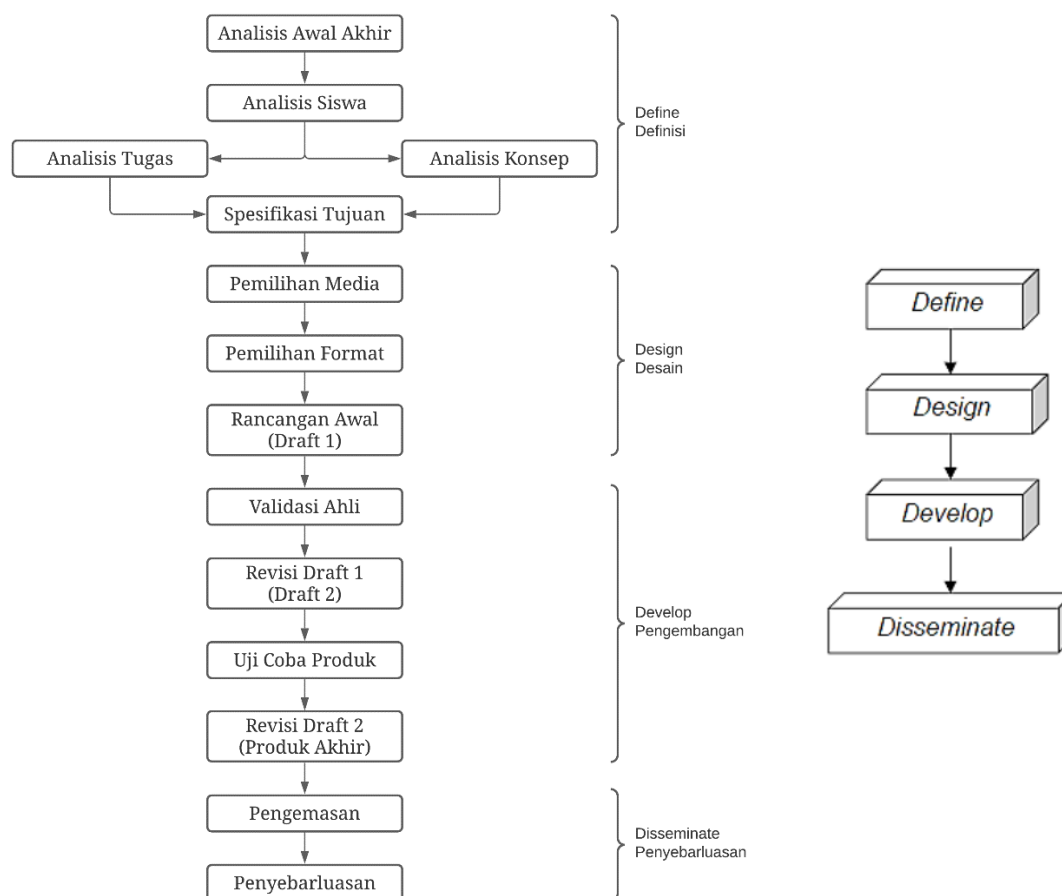


Figure 2. research procedure

The research conducted is the development of an interactive media product for the subject of Basic Electrical Engineering using Articulate Storyline software. The research was carried out at SMK N 2 Lubuk Basung using the 4D research model and consists of four stages: Define, Design, Development, and Disseminate [17]. This research only aims to determine the validity and practicality of the developed product and only goes up to the development stage.

3.1. Define

The Definition stage (Define) is the initial stage that is carried out before developing the interactive learning media product. At this stage, problems that exist in the learning

activities will be identified and solutions will be formulated. Based on observations that have been carried out at SMK N 2 Lubuk Basung, there are several things that form the basis of this research. Some of these include:

a) Initial Analysis

In this stage, the researcher conducted observations at SMK N 2 Lubuk Basung, related to finding out problems encountered in teaching and learning activities. Based on the observation and interview results with the subject teacher, the Basic Electricity Engineering subject is a new subject in the SMK PK (Center of Excellence) program, so there is still a lack of availability of interesting learning media. This causes students' learning outcomes to not be optimal.

b) Student Analysis

Based on the observation results in the learning process, the media used is quite monotonous, causing the students' interest in the Basic Electricity Engineering subject to be relatively low. The limitations of learning media also become a factor that forces the educator to provide media that is not varied, such as books with limited quantities in the school library and PDF files that are not much different from books. Furthermore, the characteristics of students who tend to prefer electronic-based learning media rather than media using blackboards and text books.

c) Task Analysis

Interactive learning media using Articulate Storyline is designed based on the student and teacher books for Basic Electricity Engineering in vocational schools. Based on the characteristics of the students, an interactive learning media product using Articulate Storyline in the Basic Electricity Engineering subject was developed, because it has advantages in combining various media such as animations, images, sounds and colors.

d) Concept Analysis

Based on the elements contained in the Basic Electricity Engineering learning outcomes, a systematically arranged concept was born. The material concept starts with simple knowledge, then followed by more complex knowledge.

e) Learning Objective Specification

The formulation of learning objectives or learning outcome indicators is made based on the elements listed in the learning outcomes. These elements are elaborated into materials, then presented in the Articulate Storyline interactive learning media, which must be adjusted to the learning objectives.

2.2. Design

The design stage is carried out to design the interactive learning media that will be developed. This stage has three steps, namely media selection, format selection, and initial design.

a) Media Selection

The software selected to design the interactive learning media is Articulate Storyline. Articulate Storyline is software that can support the process of developing interactive learning media because it has advantages in the field of authoring tools. This media development is made using Articulate Storyline software with a laptop and published as an application.

b) Format Selection

This stage starts with adjusting the media design to the learning material that refers to the elements in the Learning Outcome (CP). Based on this, the selected media format is arranged according to the following concept map.

c) Initial Design

The initial design process is carried out before entering the development stage. The process carried out in this stage starts from planning the form of learning media, then preparing the basic materials for the media using Adobe Photoshop software, such as the design of the application icon, background, images, navigation buttons, audio, and materials, and finally, the basic materials are used in the creation of Articulate Storyline interactive learning media.

2.3. Develop

The Development stage aims to assess the feasibility of the media for use after its completion. The feasibility of the media is measured by conducting a validation survey through expert assessments in their respective fields to obtain suggestions for improvement and refinement.

2.4. Disseminate

The dissemination stage is the final stage in the 4-D research. In this stage, the media that has undergone the feasibility evaluation process and has been deemed feasible and practical for use is spread. This stage is carried out by publishing the learning media through a website that can be accessed via the internet network, and can also be distributed through a download link for installation on a smart phone for easy access without using a network.

3. RESULTS AND DISCUSSION (11 pt)

a. Application Main Page

On the main page, the title of the related learning material will be displayed along with an entrance button that will guide the student to the name filling column, where the student must fill in the user name of the media before proceeding to the main menu page (Figure 3-5).



Figure 3. Interactive Learning Media



Figure 4. Main Menu

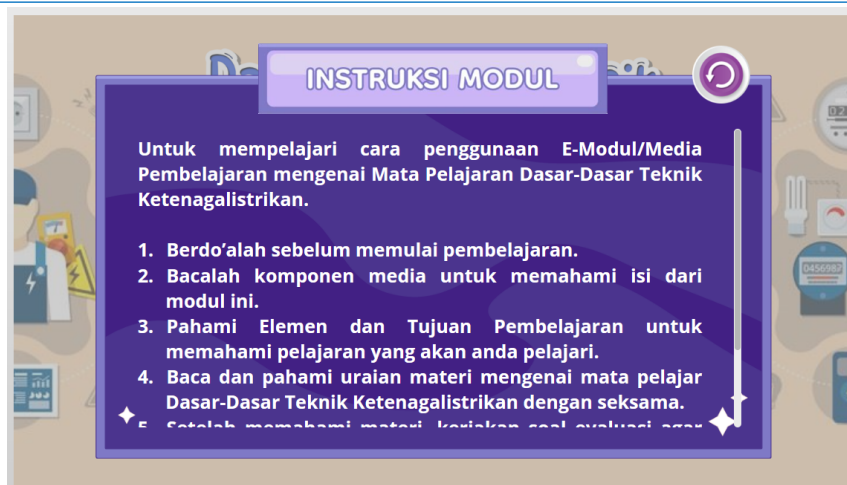


Figure 5. Instructional Display

b. Validity Testing

An expert in media is a chosen validator to assess the quality and presentation of the Articulate Storyline Interactive Learning Media, including the practicality of the media, language use, selection of background sound, image quality, layout and consistency of illustrations. The process of evaluating the validity of the media expert is done through filling out a questionnaire about the validity of the media and data from the validation process with media experts are outlined in the following table 1.

Table 1. Media Validation Result

Aspect	Max Score	Validator				V	Category
		I	II	III	IV		
Media Practicality	15	15	15	13	15	0,96	Valid
Language Use	15	13	14	12	14	0,85	Valid
Background Sound Selection	10	9	9	9	10	0,91	Valid
Image Quality	15	14	14	13	13	0,88	Valid
Layout	10	9	9	9	10	0,91	Valid
Illustration fit	5	5	4	3	5	0,81	Valid
Total						5,31	Valid
Average						0,89	

Based on the results of media validation by media experts above, it can be concluded that from the aspect of practicality of media in interactive learning media using Articulate Storyline, it obtained a score of 1 with a valid category, the practicality aspect obtained a

score of 0.96, the use of language aspect obtained a score of 0.85 with a valid category, the selection of background sound obtained a score of 0.91 with a valid category, the quality of images obtained a score of 0.88 with a valid category, the layout aspect obtained a score of 0.91 with a valid category, and the compatibility of illustrations obtained a score of 0.81 with a valid category.

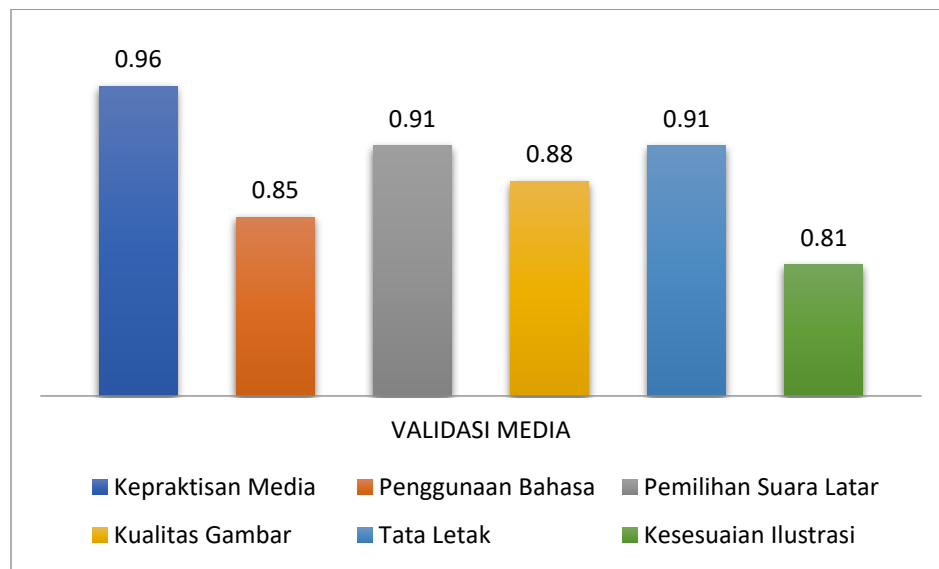


Figure 6. Bar Graph of Media Validation Results

From several assessment results, it can be concluded that the interactive learning media using Articulate Storyline in the Basic Electricity and Electrotechnics subject has an average score from the total sum of all aspects with a score of 0.89. The validity category of the media by experts was analyzed using Aiken's V statistical formula. The range of categories is from 0 to 1.00 with a validity limit of $V \geq 0.8$. The result obtained from media validation is 0.89 with a valid category (Table 1 & Figure 6).

Table 2. Material Validation Result

Aspect	Max Score	Validator		V	Category
		I	II		
Competency Suitability	15	15	15	1,00	Valid
Giving Motivation	15	13	14	0,88	Valid
Evaluation	10	8	10	0,88	Valid
Material Quality	15	12	13	0,83	Valid

Material Selection	10	8	9	0,81	Valid
Relevance	10	8	9	0,81	Valid
Total				5,21	Valid
Average				0,87	

Based on the calculation of the validation data by subject matter experts, it can be concluded that in terms of competence suitability in the interactive learning media using Articulate Storyline, the evaluation result is 1 with the category valid, motivation aspect got a result of 0.88, evaluation aspect got a result of 0.88 with the category valid, material quality aspect got a result of 0.83 with the category valid, material selection aspect got a result of 0.81 with the category valid, and relevance aspect got a result of 0.81 with the category valid (Table 2 and Figure 7).

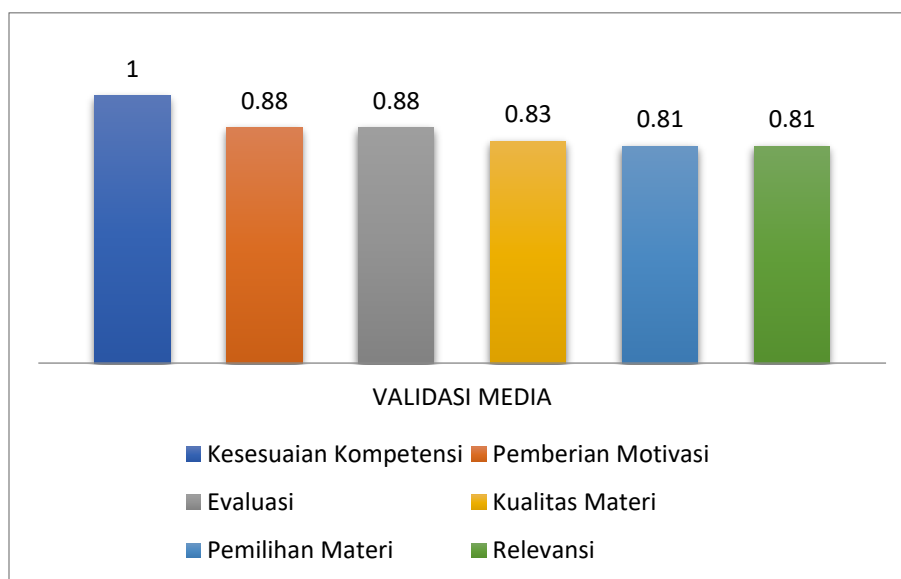


Figure 7. Bar Graph of Material Validation Results

c. Practicality Testing

The practicality of the media was tested by conducting a practice session with students and teachers to obtain their response or feedback regarding the Articulate Storyline interactive learning media. The students involved were from grade 10 at SMK N 2 Lubuk Basung. The students were given an explanation and a link to access and use the Articulate Storyline interactive learning media. After using and following the material presented, the students provided their response through a survey questionnaire. The following is a detail of the results from the practical session:

Table 3. Practicality Testing Result

No.	Respondents	Total	Max Total	Percentage	Crtieria
1	R1	70	70	100%	Very Practical
2	R2	61	70	87%	Very Practical
3	R3	63	70	90%	Very Practical
4	R4	65	70	93%	Very Practical
5	R5	64	70	91%	Very Practical
6	R6	57	70	81%	Very Practical
7	R7	66	70	94%	Very Practical
8	R8	61	70	87%	Very Practical
9	R9	65	70	93%	Very Practical
10	R10	61	70	87%	Very Practical
11	R11	56	70	80%	Practical
12	R12	65	70	93%	Very Practical
13	R13	60	70	86%	Very Practical
14	R14	69	70	99%	Very Practical
15	R15	69	70	99%	Very Practical
16	R16	62	70	89%	Very Practical
17	R17	63	70	90%	Very Practical
18	R18	64	70	91%	Very Practical
19	R19	69	70	99%	Very Practical
20	R20	59	70	84%	Very Practical
Total		1269	1400	91%	Very Practical

Based on the results table of the practical test conducted on 20 students, a total score of 1269 was obtained from the total overall score of 1400. As shown in the table, the percentage of the level of practicality of the interactive learning media using articulate storyline can be calculated as follows:

The Practicality Value = (obtained score)/(maximum score) × 100%

The Practicality Value = 1269/1400 × 100%

The Practicality Value = 91%

Based on the calculation above, the result of the student's practicality is 91% with the category of "very practical".

4. CONCLUSION

Based on the results of the research that have been described, the research and development objectives for the learning media using Articulate Storyline in the subject of Basic Electrical and Electronic Techniques for class X at SMK N 2 Lubuk Basung have been achieved. This learning media uses the 4D method which consists of four stages, Define, Design, Development, and Disseminate. The validity of the learning media was calculated using the Aiken's V statistical formula and obtained an overall average of 0.89 with a valid category. Then, the validity of the material was carried out by lecturers in electrical engineering education and basic electrical power engineering subject teachers, resulting in an average of 0.87 with a valid category. The practicality test was conducted on teachers of Class X SMK N 2 Lubuk Basung and 20 Class X SMK N 2 Lubuk Basung students. The practicality test was carried out directly with the practicality sheet after the teacher and students used the learning media being developed. The overall results of the teacher's practicality test obtained an average assessment of 91% with the criteria of being very practical, so it can be concluded that the teacher can use the Articulate Storyline learning media as teaching materials in teaching and learning activities. The student trial was carried out offline using a laptop and smartphone that had already installed the DTKL X SMK_1_1.0.apk media application. The overall results of the student's practicality test obtained an average assessment of 91% with the criteria of being very practical, meaning that the learning media can be used in learning activities. Based on the results and limitations of the research, there are several recommendations aimed at optimizing future research. Here are some of the suggestions that can be given: (1) The learning media with Articulate Storyline can be used as a supporting tool for teaching Basic Electrical Engineering for class X in SMK. (2) It is expected that future research will develop a learning media that can be operated in a connected form to other devices, so that the use of media by students can be monitored by the teacher without manual supervision. (3) This media needs further development on other topics, such as first semester materials.

REFERENCES

- [1] Williem Iskandar Pasar, "MULTIMEDIA INTERAKTIF SEBAGAI MEDIA PEMBELAJARAN PADA MASA PANDEMI COVID 19 Purbatua Manurung."
- [2] L. Afriani and Y. Fitria, "Pengembangan Media Pembelajaran Berbasis Teknologi Berbantuan Adobe Flash Cs6 untuk Pembelajaran pada Masa Pandemi Covid-19," *EDUKATIF: JURNAL ILMU PENDIDIKAN*, vol. 3, no. 4, pp. 2141–2148, Aug. 2021, doi: 10.31004/edukatif.v3i4.1171.
- [3] S. Y. Almossa, "University students' perspectives toward learning and assessment during COVID-19.," *Educ Inf Technol (Dordr)*, no. 0123456789, pp. 1–19, 2021, doi: 10.1007/s10639-021-10554-8.
- [4] S. J. Daniel, "Education and the COVID-19 pandemic," *Prospects (Paris)*, vol. 49, no. 1–2, pp. 91–96, 2020, doi: 10.1007/s11125-020-09464-3.
- [5] A. Sadikin and A. Hamidah, "Pembelajaran Daring di Tengah Wabah Covid-19," *Biodik*, vol. 6, no. 2, pp. 109–119, 2020, doi: 10.22437/bio.v6i2.9759.

- [6] S. L. Schneider and M. L. Council, "Distance learning in the era of COVID-19," *Archives of Dermatological Research* 2020 313:5, vol. 313, no. 5, pp. 389–390, May 2020, doi: 10.1007/S00403-020-02088-9.
- [7] R. Salam, H. Akib, and D. Daraba, "Utilization of Learning Media In Motivating Student Learning," vol. 226, no. Icsc, pp. 1100–1103, 2020, doi: 10.2991/icss-18.2018.232.
- [8] F. P. Rachmavita, "Interactive media-based video animation and student learning motivation in mathematics," *J Phys Conf Ser*, 2020, doi: 10.1088/1742-6596/1663/1/012040.
- [9] S. Bachri, L. Y. Irawan, and M. Aliman, "E-module in Blended Learning: Its Impact on Students' Disaster Preparedness and Innovation in Developing Learning Media.," *International Journal of ...*, 2021, [Online]. Available: https://www.researchgate.net/profile/Muhammad-Aliman/publication/353317656_E-module_in_Blended_Learning_Its_Impact_on_Students'_Disaster_Preparedness_and_Innovation_in_Developing_Learning_Media/links/60f3780afb568a7098b9488b/E-module-in-Blended-Learning-I
- [10] K. S. Kartini, N. Tri, and A. Putra, "Respon Siswa Terhadap Pengembangan Media Pembelajaran Interaktif Berbasis Android," *Jurnal Pendidikan Kimia Indonesia*, vol. 4, pp. 12–19, 2020, [Online]. Available: <https://ejournal.undiksha.ac.id/index.php/JPK/index>
- [11] Y. D. Puspitarini and M. Hanif, "Using Learning Media to Increase Learning Motivation in Elementary School," *Anatolian Journal of Education*, vol. 4, no. 2, pp. 53–60, 2019, doi: 10.29333/aje.2019.426a.
- [12] K. M. Y. Law, S. Geng, and T. Li, "Student enrollment, motivation and learning performance in a blended learning environment: The mediating effects of social, teaching, and cognitive presence," *Comput Educ*, vol. 136, pp. 1–12, Jul. 2019, doi: 10.1016/J.COMPEDU.2019.02.021.
- [13] S. Setyaningsih and A. Wahyudi, "Pengaruh Penggunaan Media Pembelajaran Interaktif Berbasis Articulate Storyline Terhadap Motivasi Belajar Dan Hasil Belajar Siswa Pada Materi Kerajaan Hindu Budha Di Indonesia."
- [14] Marriyatul Kiptiyah, Munoto Ismet Basuki, and Euis Ismayati, "Pengembangan Media Pembelajaran Interaktif Menggunakan Articulate Storyline 3 Pada Mata Pelajaran Dasar-Dasar Teknik Ketenagalistrikan Di Smkn 1 Sidoarjo."
- [15] Sugiyono, "METODE PENELITIAN DAN PENGEMBANGAN (Research and Development/ R&D)," p. 38, 2019.
- [16] Sugiyono, *Metodologi Penelitian Kuantitatif, Kualitatif, dan R&D*. 2016. doi: <https://doi.org/10.3929/ethz-b-000238666>.
- [17] I. Solikin and R. Amalia, "Materi Digital Berbasis Web Mobile Menggunakan Model 4D," *Sistemasi*, vol. 8, no. 3, p. 321, 2019, doi: 10.32520/stmsi.v8i3.461.