



## The Effectiveness and Practicality of Web-based Learning Media with Wix Platform in Vocational High Schools

Chairatul Umamah<sup>1)\*</sup>, Inayatun Diraya<sup>2)</sup>, Herman Jufri Andi<sup>3)</sup>

<sup>1),2),3)</sup>Physics Education Study Program, Universitas Islam Madura, Pamekasan, 69351, Indonesia

\*Corresponding author: [chairatul.physics@gmail.com](mailto:chairatul.physics@gmail.com)

Received: October 23, 2022; Accepted: January 06, 2023; Published: January 31, 2023

**Abstract** – Learning media is one of the instruments which is used to support the achievement of learning process. Now, the use of learning media based on technology is widely used at various levels of education based on school needs. One of the learning media used in this study is Wix platform. The purpose of this study was to describe and measure the effectiveness and practicality of using the web-based learning media with Wix platform in vocational high schools. This type of research is research and development employing Borg and Gall development model. The research subjects consisted of media experts, material experts, and sample class consist of 19 students of X class at SMKN 1 Pakong. In this study, the effectiveness of learning media is measured by students' learning outcomes before and after using learning media. The media practicality questionnaire for teachers was used to collect data as teacher responses after testing the media product developed in the form of web with Wix platform. The results of the research show that the practicality percentage of Wix platform as physics learning media was 95.7% which is categorized as "Very practical". In addition, the effectiveness of Wix platform as learning media gained a percentage of 0.6% or in the "effective" category. Therefore, it can be concluded that learning media based on Web with Wix platform is very practical and effective in physics learning activities.

**Keywords:** learning media; WEB; WIX platform

© 2023 Physics Education Department, Universitas Muhammadiyah Makassar, Indonesia.

### I. INTRODUCTION

The amount of education that students have acquired will decide the quality of human resources because education has a significant impact on how human character and personality are formed (Sari et al., 2022). The human resource quality and advancement of a country are assessed using the education quality index (Basilaia & Kvavadze, 2020). One of the industries that has been adversely

impacted by the COVID-19 pandemic is education. The government, in particular the Minister of Education and Culture, released MENDIKBUD Circular Letter No.4 of 2020 regarding Policies for Implementing Education in the Emergency Period of the Spread of Coronavirus Disease (Covid-19). In this condition, it is necessary for students to study independently at home because the learning process is also carried out online (in a

network) (Lo et al., 2013). Online learning does not fully satisfy students (Riggs & Linder, 2016; Sasikala et al., 2021).

In order to support learning activities effectively and efficiently and to foster a positive learning environment that will promote increased students' achievement and enhance the standard of education provided by schools, schools must develop learning programs and strategies during the COVID-19 pandemic. Similar to the situation at SMKN 1 Pakong-Pamekasan, this was carried out to adhere to government regulations and stop the spread of COVID-19 (Pandey et al., 2022).

Learning media are the main means to support the success of the teaching and learning process, especially during the current pandemic conditions, because they are increasingly needed to overcome various problems, such as limited space, time, and facilities (Kalatting et al., 2015). Learning media is a tool that has the nature of delivering messages and can stimulate the thoughts, feelings, and abilities of students so as to encourage the learning process (Anggraini, 2019). Learning media can assist teachers in creating a more lively learning atmosphere that is not monotonous or boring (Wahid, 2018). Especially during the current pandemic, learning media play an important role in the distance learning process. The use of the website can be an alternative learning medium that can be used in teaching and learning activities (Sancho et al., 2006).

The problem experienced by schools during the pandemic was that education services were carried out online, resulting in less than optimal learning by teachers and students (Alatas, 2019). Students do not fully understand programming languages for website creation (Syam, 2017). Students have not been able to take advantage of the platform for website creation. Some students have not fully mastered the programming language (Astuti et al., 2020). This condition can cause the material being studied to not be understood properly (Bosch et al., 2021; Nuraini et al., 2021; Mukti et al., 2020).

Based on the results of my observations at SMKN 1 Pakong, the learning media used in physics subjects were only Google Classroom and WhatsApp application. Website development as a learning medium can be one of the innovations and can be an option for use in online teaching and learning processes (Ferdiansyah & Irfan, 2021). Websites that can be used as learning media vary; one type is the Wix platform-assisted website. The use of a website assisted by the Wix platform as a learning medium can provide new learning experiences for students to study physics material. It is hoped that learning using the Wix platform can improve student's learning outcomes, especially in cognitive area (Anggraini, 2019; Eliyarti et al., 2020).

Research on web-based media has been conducted by Yu Ren Lin, who created an argumentation program to support the concept of science. According to Lin et al. (2020) WAP

(Web-based Argumentation Program) is used to build learning content because it is considered able to help beginners learn how to think critically and scientifically. The results obtained proved to be an increase in the quality of argumentation after using WAP. Then a web-based virtual laboratory for biodiesel material was studied by Peinazo-Morales Manuel. According to [Manuel et al. \(2019\)](#), this website is able to facilitate students' independent learning, evaluation of bathing, and evaluation of the learning process between students and teachers, and has been tested on master students with good results. [Shabrina & Diani, \(2019\)](#), in her research entitled "Development of Web-Based Physics Learning Media Enhanced Course With Guided Inquiry Model Development Of Physical Learning Media Based On Web Enhanced Course With Guided Inquiry Model", concluded that physics learning media in the form of a web is suitable for use as a learning Media ([Scolari, 2018](#); [Asyhari & Diani, 2017](#)).

The formulation of the problem in this research is how practical is the web-based physics learning media assisted by Wix platform on wave material for vocational high school students sourced from teachers and web-based assisted by the Wix platform on wave material for vocational high school students.

## II. METHODS

The method used in this study is the research and development method, or what is commonly referred to as the "research and development" (R&D) method with reference to the Borg & Gall development procedures, namely the descriptive method of the steps in developing a new product or perfecting an existing product that can be accounted for ([Agustini et al., 2018](#)). According to Borg and Gall ([Sugiyono, 2017](#)), the R&D method is research that develops or validates products to be used in research and learning. The product developed in this study is a web-based physics learning medium assisted by the wix platform for wave material in vocational high schools. The research and development steps were carried out using the Borg & Gall modification and development model. This study's sample consisted of class X students from the TKJ Department at SMK Negeri 1 Pakong. The sampling technique is a sampling technique. The sampling technique used in this research is simple random sampling.

The complete Borg & Gall development model refers to experiments conducted at the Far West Laboratory ([Agustini et al., 2018](#)), which include the ten steps listed below:

1. Research and data collection (research and information collection)
2. Planning (Planning)
3. Development of the product draft (develop a preliminary form of the product)

4. Preliminary field testing
5. Revise product results (main product revision)
6. Field trials (main field testing)
7. Completion of product results from field tests (operational product revision)
8. Field implementation test (operational field testing)
9. completion of the final product (field product revision)
10. Dissemination and Implementation (Dissemination and Implementation)

The researcher limited the development research of the ten research strategies to only seven due to time constraints, and the researcher focused on the appropriateness the practicality of the media to be used by the teachers in the classroom and how it effective the media was for the students. Thus, dissemination step was skipped.

Data analysis was conducted to figure out the results of assessments and subject teacher responses related to the practicality of products applied in the field. The questionnaire instrument was used by the teacher to collect data regarding the practicality of the media. To calculate the percentage of media practicality from the teacher, we use the equation below:

$$P(s) = \frac{s}{N} \times 100\% \quad (1)$$

(Riduwan & Akdon, 2010)

With;

- P(s) : Percentage of sub-variables
- S : Total score of each sub-variable
- N : Total maximum score

The researcher changed the results of the teacher's statement scale in the score scale. Based on the Likert scale, there are 5 rating scales in the table, as follows:

**Table 1.** Scoring rules

Description	Score
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

In the last step, the average percentage of practicality of the media from the teacher was grouped in the interpretation of the score according to the Likert scale so as to obtain the final result of the teacher's response. The following interpretation guidelines were used:

**Table 2.** Media Practicality Level Criteria

No	Practicality Scale	Criteria
1	81-100%	Very Practical
2	61-80%	Practical
3	41-60%	Pretty Practical
4	21-40%	Less Practical
5	0-20%	Impractical

(Sugiyono, 2008)

The test instrument is used to collect data from students on the effectiveness of the media. There are two kinds of tests that are often used in the development, namely pretest and post-test. In this research, the pretest and post-test were used to determine the effectiveness of products in the form of web-based learning media when they are implemented on students. In this study, the researchers measured the effectiveness of the

media by examining at students' learning outcomes before and after using the media.

The effectiveness of the media can be measured by using the following equation:

$$(g) = \frac{(\bar{x}_{\text{final}}) - (\bar{x}_{\text{early}})}{100\% - (\bar{x}_{\text{early}})} \quad (2)$$

(Ramdhani et al., 2020)

With;

(g) = Effectiveness Level

( $\bar{x}_{\text{early}}$ ) = Preliminary test average score

( $\bar{x}_{\text{final}}$ ) = final test average score

**Table 3.** Effectiveness Criteria

No	<g> gain %	Criteria
1	$g > 0,7$	High
2	$0,3 \leq g \leq 0,7$	Medium
3	$g < 0,3$	Low

(Ramdhani et al., 2020)

### III. RESULTS AND DISCUSSION

The results of this development research are (1) The web-based learning medium assisted by the Wix platform on wave material for class X TKJ students at SMK Negeri 1 Pakong which has been developed and uploaded, and can be accessed online via the url address:

<https://physicssites.wixsite.com/smkn1pakong>

(2) The results of the teacher's assessment of the media related to the practicality of the media that have been made, and (3) The results of the pretest and post-test related to the effectiveness of web-based learning media. The development of web-based learning media assisted by the Wix platform which refers to the Borg and Gall development model, has

been modified into seven stages: potentials and problems, data collection, product design, design validation, design revision, product testing, and finally design revision.

### Results of Media Practicality by Teachers

The developed media was then tested on real-life situations for physics subject teachers during the trial stage. Trials were carried out to find out whether the practicality of web-based learning media is practical or not when applied to learning. The trial was conducted with three teachers.

The first step before conducting the trial was to explain the instructions for using web-based learning media to the teacher. In the implementation process, the teacher was introduced to several supporting features available in the developed media. After the teacher could access media and understand media content, then the teacher applied web-based learning media to students directly. In the final stage, the teacher gave their responses and assessments through a questionnaire that had been provided by the researcher. The results of the assessment of the teacher's responses to web-based learning media are as follows:

**Tabel 4.** Results of the Media Practicality Assessment by the Teachers

	<b>Display Design</b>	<b>Content Quality</b>	<b>Technical/Performance Quality</b>
Teacher 1st	100%	95,6%	100%
Teacher 2nd	96%	100%	100%
Teacher 3rd	92%	91,1%	86,7%

Based on the results of the teacher's assessment regarding the practicality of the media, it can be seen that in the display design aspect, teacher 1 gave a perfect score percentage 100%, while teacher 2 and 3 gave a score percentage 96%, and 92%, respectively. In the aspect of content quality, it was teacher 2 which gave a perfect score that is 100%, while teacher 1 and teacher 3 gave a score of 95.6% and 91.1%. In terms of technical/performance quality, two teachers (teacher 1 and 2) gave a score of 100%, while teacher 3 gave a bit lower score that was 86.7%. Overall, the average percentage for teacher 1 was 98.5% in the very practical category with small-scale revisions, for teacher 2 was 98.7% in the very practical category without revision, and for teacher 3 was 89.9% in the very practical category without revision. The average results of the teacher's practicality assessment of the media are a practicality percentage of 95.7% in the "Very Practical" category. Teacher responses regarding web-based learning media assisted by the Wix platform indicate that this media is suitable for students' needs with text, images, videos, and animations. Through multimedia learning, students can learn independently and can utilize technology in the teaching process. The addition of a virtual practicum is very

useful if implemented, especially for schools with inadequate laboratory facilities. In addition, quizzes help teachers assess the extent to which students understand the material through the concept of educational games. However, there are problems when connecting to web-based learning media because the internet connection available at schools must be stable so that the media access process runs smoothly (Riggs & Linder, 2016).

Web-based learning media displays clear text, selects attractive colors, and determines images. Animations are appropriate so that they can help students understand course material with the help of multimedia-based learning. with a display tailored to the needs of students in order to improve performance in achieving predetermined learning objectives. Media that is equipped with multimedia can describe abstract things to attract more attention and interest without reducing the essence of learning media in general (Dwipamgestu et al., 2018).

The results of the average practicality test of media by teachers which was in the "very practical" category was supported by several previous studies. Research regarding website-based learning media for the Programmable Logic Controller (PLC) received a positive response from student,

(Agustina & Suprianto, 2018), obtaining an assessment of 31.27% for the very good category and 53.85% for the good category for all aspects assessed, namely media display, material/content, and language. If the two assessments with very good and good categories are added up, then an assessment of 85.12 percent is obtained, which can be interpreted that the learning media developed are very practical to use in learning. The research from (Shabrina & Diani, 2019) which produces a web enhanced course with a guided inquiry model with the categories obtained are very feasible and field trials can be carried out. In (Yasin et al., 2018) research concerning the practicality of interactive courseware media in IML subjects, two stages of trials were carried out on 283 students. Data were obtained through a questionnaire that focused on three aspects, namely the aspect of instruction, the quality of the media used, and the suitability of the content with the curriculum. From the results obtained, it was obtained an average of 90.23% which can be interpreted as a very practical learning media for researchers to use in learning.

### **Media Effectiveness Trial Results**

In the final stage, after the teacher tested the practicality of the media, the effectiveness of web-based learning media was tested on students of SMKN 1 Pakong Class X TKJ on wave material, with a total of 19 students. In the effectiveness test, students are given ten multiple-choice questions with the goal of

determining the increase in students' learning outcomes. At this stage, an increase in students' understanding of the course material will be seen when using web-based learning media. The effectiveness test was carried out before students used web-based learning media, namely the initial test (pretest), and after using web-based learning media, namely the post-test.

Based on the test results it was known that there was an increase of the score before and after using web-based learning media. The average value of the initial test was 42.63, and the average value of the final test was 76.84. Thus, it was obtained that the level of student understanding increased by 0.6%, and this result indicated that the web-based learning media have "medium" category of effectiveness. From 19 students in class X TKJ SMKN 1 Pakong, 17 students' score were classified into medium category and 2 students' scores were in high category media. Therefore, it can be concluded that the web-based learning media is effective and can be used in physics subjects as a learning tool at school and used to increase students' understanding of the material presented. Learning by using web-based learning media is effective because the teaching materials can be visualized in various formats, are more dynamic and interactive, and create digital transformations that are bridged by internet technology (Affandi et al., 2020; Kurniawan, 2017). Furthermore, e-learning can encourage students to develop their thinking skills by

requiring them to solve problems without the assistance of a teacher. This is in line with the results of research conducted by Setiyoadi et al. 2021 in (Sari et al., 2022), which explains that using e-learning media makes students more creative in solving existing problems so that it has a good impact on their learning outcomes.

The effectiveness of using the Wix platform for web media is the subject of other research. According to Suanah (2019), an increase in minimum completeness criteria score shows that the WIX website learning media is very effective for improving learning outcomes in learning activities. This is in line with the opinion according to Yasin et al. (2018), which state that the use of website-based learning media can improve learning outcomes in teaching and learning activities.

The results of the practicality and effectiveness assessment of web-based physics learning media assisted by the Wix platform are very feasible, very practical, and effective as learning media in learning activities. This is in accordance with research from (Shabrina & Diani, 2019) which produces a web-enhanced course with a guided inquiry model where the categories obtained are very feasible and field trials can be carried out (Milala et al., 2022). In addition to adding a practicum menu, there is a quiz menu that is presented on web-based learning media (Annisa et al., 2020). Utilizing quizzes on the web for students can attract students' interest in learning and make it easier for teachers to assess students' learning

outcomes (Nurfadilah et al., 2021; Haloho et al., 2019). Web-based learning media can utilize smartphones owned for learning at school and distance learning (Abiyoga & Rahmiati, 2021). According to research by Astuti et al. (2020), web-based learning media are utilized as online learning media due to its affordability, ease of access, and easy design using various platforms. Learning media are materials, tools, methods, or techniques used in teaching and learning activities with the goal of facilitating the educational combination interaction process between teachers and students using both hardware and software (Cahyadi et al., 2022). Learning media are media that convey messages with instructional or teaching purposes. The use of learning media can generate students' motivation and interest (Sakti & Napsawati, 2021).

#### IV. CONCLUSION AND SUGGESTION

From the data analysis, it was known that the average result of the practicality assessment of the developed media conducted by the teachers for wave materials is a percentage of 95.7% or in the "Very Practical" category. Besides, the level of students' understanding on wave materials increased by 0.6%, and this result indicated that the web-based learning media have "medium" category of effectiveness. Therefore, the teachers are recommended to use this web-based learning media that has been proven practical and effective to teach physics materials.



## ACKNOWLEDGMENTS

Sincere thanks are addressed to various parties, particularly the Universitas Islam Madura and all people who have helped the completion of this research.

## REFERENCES

- Abiyoga, B., & Rahmiati, R. (2021). Efektivitas media pembelajaran berbasis android pada mata pelajaran perawatan wajah, badan (body massage) dan waxing di SMK. *Jurnal Edutech Undiksha*, 9(2), 284-290. <https://doi.org/10.23887/jeu.v9i2.41038>
- Affandi, M. R., Widyawati, M., & Bhakti, Y. B. (2020). Analisis efektivitas media pembelajaran e-learning dalam meningkatkan hasil belajar siswa kelas X pada pelajaran fisika. *JPF (Jurnal Pendidikan Fisika) FKIP UM Metro* 8(2), 150–157. <http://dx.doi.org/10.24127/jpf.v8i2.2910>
- Agustina, R., & Suprianto, D. (2018). Analisis hasil pemanfaatan media pembelajaran interaktif aljabar logika dengan user acceptance test (UAT). *Smatika Jurnal: STIKI Informatika Jurnal*, 8(02), 67–73. <https://doi.org/10.32664/smatika.v8i02.205>
- Agustini, S., Arsyad, M., & Yani, A. (2018). Penggunaan media pembelajaran virtual lab terhadap pemahaman konsep fisika pada peserta didik SMA Negeri 1 Marioriwawo. *Prosiding Seminar Nasional Fisika Program Pascasarjana Universitas Negeri Makasar*, 1, 1–3.
- Alatas, F. (2019). Developing simple teaching aids on static fluid material as a learning media for physics. *Jurnal Pendidikan Fisika*, 7(2), 197–211. <https://doi.org/10.26618/jpf.v7i2.1749>
- Anggraini, R. M. (2019). Developing a module on sound wave of solid, liquid, and gas substances through problem solving model with matlab simulation on wave and optical courses. *Jurnal Pendidikan Fisika*, 7(2), 173–182. <https://doi.org/10.26618/jpf.v7i2.1996>
- Annisa, A. R., Putra, A. P., & Dharmono, D. (2020). Kepraktisan media pembelajaran daya antibakteri ekstrak buah sawo berbasis macromedia flash. *Quantum: Jurnal Inovasi Pendidikan Sains*, 11(1), 72-80. <https://doi.org/10.20527/quantum.v11i1.8204>
- Astuti, L., Wihardi, Y., & Rochintaniawati, D. (2020). The development of web-based learning using interactive media for science learning on levers in human body topic. *Journal of Science Learning*, 3(2), 89–98. <https://doi.org/10.17509/jsl.v3i2.19366>
- Asyhari, A., & Diani, R. (2017). Pembelajaran fisika berbasis web enhanced course: mengembangkan web-logs pembelajaran fisika dasar I. *Jurnal Inovasi Teknologi Pendidikan*, 4(1), 13-25. <https://doi.org/10.21831/jitp.v4i1.13435>
- Basilaia, G., & Kvavadze, D. (2020). Transition to online education in schools during a SARS-CoV-2 coronavirus (covid-19) pandemic in Georgia. *Pedagogical Research*, 5(4), 1-9. <https://doi.org/10.29333/pr/7937>
- Bosch, E., Seifried, E., & Spinath, B. (2021). What successful students do: Evidence-based learning activities matter for students' performance in higher education beyond prior knowledge, motivation, and prior achievement. *Learning and Individual Differences*, 91, 1-12. <https://doi.org/10.1016/j.lindif.2021.102056>

- Cahyadi, A. T., Miftahuddin, N., Islahiyah, N. S., Yulianti, F. D., & Masturah, B. N. H. (2022). Website designing for business enterprises using Wix.com. *Visualita: Jurnal Online Desain Komunikasi Visual*, 10(2), 23–33.  
<https://doi.org/10.34010/visualita.v10i02.6562>
- Dwipangestu, R., Mayub, A., & Rohadi, N. (2018). Pengembangan desain media pembelajaran fisika SMA berbasis video pada materi gelombang bunyi. *Jurnal Kumparan Fisika*, 1(1), 48–55.  
<https://doi.org/10.33369/jkf.1.1.48-55>
- Eliyarti, E., Rahayu, C., Zakirman, Z. (2020). Penerapan bahan ajar fisika dengan variasi bentuk tugas berbasis web untuk meningkatkan hasil belajar mahasiswa Teknik. *Jurnal Pendidikan Fisika Undksha*, 10(2), 82-90.  
<https://doi.org/10.23887/jjpf.v10i2.29910>
- Ferdiansyah, F., & Irfan, D. (2021). Interactive learning media based on website in vocational school. *Al-Ishlah: Jurnal Pendidikan*, 13(1), 755–762.  
<https://doi.org/10.35445/alishlah.v13i1.591>
- Haloho, K. H., Tanjung, R., & Sudarma, T. F. (2019). Rancangan media pembelajaran fisika berbasis website pada materi pokok fluida dinamis kelas XI. *Jurnal Ikatan Alumni Fisika Universitas Negeri Medan*, 5(1), 35-41.  
<https://doi.org/10.24114/jiaf.v5i1.12380>
- Kalatting, S., Serevina, V., & Astra, I. M. (2015). Pengembangan media pembelajaran fisika berbasis web menggunakan pendekatan guided discovery learning. *Jurnal Penelitian & Pengembangan Pendidikan Fisika*, 1(1), 1–8.  
<https://doi.org/10.21009/1.01101>
- Kurniawan, F. A. (2017). Pengaruh pembelajaran berbasis web terhadap motivasi dan hasil belajar siswa kelas X SMA Negeri Paguyangan pada mata pelajaran fisika pokok bahasan suhu dan kalor. *Scientiae Educatia: Jurnal Pendidikan Sains*, 6(1), 1-7.  
[Doi: 10.24235/sc.educatia.v6i1.1279](https://doi.org/10.24235/sc.educatia.v6i1.1279)
- Lin, Y. R., Fan, B., & Xie, K. (2020). The influence of a web-based learning environment on low achievers' science argumentation. *Computers & Education*, 151, 1-64.  
<https://doi.org/10.1016/j.compedu.2020.103860>
- Lo, H. J., Fu, G. L., & Chuang, K. C. (2013). Needs of the learning effect on instructional website for vocational high school students. *Tojet: The Turkish Online Journal of Educational Technology*, 12(4), 113-123.
- Manuel, P. M., Pilar, A. M., Dolores, R. M. M., Dorado, Sara, P., & Pilar, M. J. M. (2019). Characterization of biodiesel using virtual laboratories integrating social networks and web app following a ubiquitous- and blended-learning. *Journal of Cleaner Production*, 215, 399–409.  
<https://doi.org/10.1016/j.jclepro.2019.01.098>
- Milala, H. F., Endryansyah., Joko., & Agung, A. I. (2022). Keefektifan dan kepraktisan media pembelajaran menggunakan dobe flash player. *Jurnal Pendidikan Teknik Elektro*, 11(02), 195–202.
- Mukti, W. M., Puspita, Y. B., & Anggraeni, Z. D. (2020). Media Pembelajaran Fisika berbasis web menggunakan google sites pada materi listrik statis. *FKIP E-Proceeding*, 5(1), 51-59.
- Nuraini, S., Marini, A., Safitri, D., Rosinar, R., Rihatno, T., Hadi, W., & Putra, Z. E. F. F. Developing web-based character value integration in school culture. *IOP Conference Series. Materials Science and Engineering*, 1098, 1-6.

- Doi. [10.1088/1757-899X/1098/5/052067](https://doi.org/10.1088/1757-899X/1098/5/052067)
- Nurfadilah., Putra, D. P., & Riskawati. (2021). Pembelajaran daring melalui game edukasi quizizz terhadap hasil belajar fisika. *Jurnal Pendidikan Fisika dan Teknologi*, 7(2), 182-189. <https://doi.org/10.29303/jpft.v7i2.2870>
- Pandey, D., Ogunmola, G. A., Enbeyle, W., Abdullahi, M., Pandey, B. K., & Pramanik, S. (2022). Covid-19: A framework for effective delivering of online classes during lockdown. *Human Arenas*, 5, 322–336. <https://doi.org/10.1007/s42087-020-00175-x>
- Ramdhani, E. P., Khoirunnisa, F., & Siregar, N. A. N. (2020). Efektifitas modul elektronik terintegrasi multiple representation pada materi ikatan kimia. *Journal of Research and Technology*, 6(1), 162–167.
- Riduwan & Akdon. (2010). *Rumus dan data dalam analisis statistika*. Cet. 2. Alfabeta.
- Riggs, S. A., & Linder, K. E. (2016). Actively engaging students in asynchronous online classes. *IDEA Center*, 64, 1-10.
- Sakti, I., & Napsawati. (2021). The development of learning media using powtoon for junior high school. *Jurnal Pendidikan Fisika*, 9(3), 198–208. <https://doi.org/10.26618/jpf.v9i3.5565>
- Sancho, P., Corral, R., Rivas, T., González, M. J., Chordi, A., & Tejedor, C. (2006). A blended learning experience for teaching microbiology. *American Journal of Pharmaceutical Education*, 70(5), 120. <https://doi.org/10.5688/aj7005120>
- Sari, S. S., Zul, M., & Haris, A. (2022). Analysis of students' physics learning outcomes using e-learning during covid-19 pandemic. *Jurnal Pendidikan Fisika* 10(1), 67–74. <https://doi.org/10.26618/jpf.v10i1.6431>
- Sasikala, M., Rajam, A., & Prema, M. (2021). Effectiveness of social media in education. *Turkish Journal of Computer and Mathematics Education*, 12(10), 6430-6432. <https://doi.org/10.17762/turcomat.v12i10.5491>
- Scolari, C. A. (2018). *Teens, media and collaborative cultures (exploiting teens' transmedia skill in the classroom)*. Transmedia Literacy Research Team
- Shabrina, A., & Diani, R. (2019). Pengembangan media pembelajaran fisika berbasis web enhanced course dengan model inkuiri terbimbing. *Indonesian Journal of Science and Mathematics Education*, 2(1), 9–26. <https://doi.org/10.24042/ij sme.v2i1.3922>
- Suanah, S. (2019). Pengembangan media pembelajaran berbasis web desain wix materi bangun ruang matematika SD Kelas V. *Proceedings of The Internasional Consortium of Education and Culture Research Studies*, 2(1), 243–252. <https://doi.org/10.21070/picrcrs.v2i1.2412>
- Sugiyono. (2008). *Metode penelitian pendidikan: Pendekatan kuantitatif, kualitatif dan R&D*. Cet. 6. Alfabeta.
- Sugiyono. (2017). *Metode penelitian pendidikan: Pendekatan kuantitatif, kualitatif dan R&D*. Alfabeta.
- Syam, N. (2017). Pengembangan media tutorial pembelajaran IPA berbasis web untuk peserta didik kelas VIII SMPN 5 Pallangga. *Jurnal Pendidikan Fisika*, 5(2), 156–174. <https://doi.org/10.26618/jpf.v5i2.621>

- Wahid, A. (2018). Pentingnya media pembelajaran dalam meningkatkan prestasi belajar. *Istiqra': Jurnal Pendidikan dan Pemikiran Islam*, 5(2), 1–11.
- Yasin, B., Mustafa, F., & Permatasari, R. (2018). How much videos win over audios in listening instruction for EFL learners. *Tojet: The Turkish Online Journal of Educational Technology*, 17(1), 92–100.