



Development of E-Booklet Learning Media to Improve Student Learning Outcomes on Parabolic Kinematics Materials

Oktavia Sitorus^{1*}, Desy Hanisa Putri², Dedy Hamdani³

¹²³Physics Education Study Program, University of Bengkulu, Bengkulu- Indonesia

ARTICLE HISTORY.

Submitted : 12 November 2024
Revised : 14 April 2025
Accepted : 30 April 2025
Publication : 30 April 2025
Available Online : 1 May 2025

KEYS WORDS.

e-booklets, learning media, learning outcomes

CORRESPONDENCE AUTHOR

*E-mail:
oktaviasitorus123@gmail.com

ABSTRACT

This study aims to describe the feasibility of e-booklet learning media to improve student learning outcomes on parabolic kinematics material, describe the improvement of student learning outcomes after using e-booklet learning media on parabolic kinematics material, and describe students' responses to the e-booklet learning media that has been developed on parabolic kinematics materials. The method used is R&D, using the ADDIE model. The results of the study showed: (1). Validation of media feasibility obtained a score with a percentage of 87.26%; (2) N-gain obtained a value of 0.77; (3) the assessment of student responses to the media, the benefit aspect, in total obtained a percentage of 89.14%. Based on the results, it can be concluded that the use of e-booklet learning media is very feasible to be used for parabolic kinematics material, to improve student learning outcomes, and received a very good response from students.

INTRODUCTION

Learning is the interaction between students and teachers and learning resources in a certain learning environment as stated in Article 1 point 20 (Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, 2003). One of the factors that affects the quality of education is the lack of availability of teaching materials (Asma et al., 2022). The existence of learning media can help teachers convey messages (materials) from learning resources to students. Learning media can be developed by utilizing information and communication technology available today. However, the reality is that many schools do not develop and use technology-based learning media, even though the use of technology-based learning media can help teachers deliver lessons more easily and on target (Adlin, 2019). With the development of this technology, teachers are required to keep up with the times in providing materials (Mahzum et al., 2020).

The object of study in physics learning is inanimate objects and natural phenomena or events related to each other. Thus, it is difficult for students to understand some abstract concepts (Rizaldi et al., 2020). In addition, the lack of student interest in physics The object of study in physics learning is inanimate objects and natural phenomena or events related to each other. Thus, it is difficult for students to understand some abstract concepts (Rizaldi et al., 2020). Lack of interest in physics by students, because they considering the number of formulas that must be memorized. As a result, students feel bored and less interested in physics lessons. If this continues to happen, it will result in a decrease in student learning outcomes due to a lack of student understanding of the material (Paoliana et al., 2020). Some students understand the material quickly, but there are students who understand it slowly due to different levels of comprehension. So, teachers must be more creative in delivering subject matter, especially in physics lessons (Yana et al., 2018 With the development of this technology, teachers are required to keep up with the times in providing materials.

Based on research (Rahim et al., 2022) also explained, they found that students had difficulty understanding the kinematics material of parabolic motion, 35 students in grade XI underwent a test on the material, with an average score of 46.57 on a scale of 100. According to (Laili et al. 2022) the lack of use of learning media makes the teaching and learning process less interesting, which has an impact on learning outcomes, an alternative solution to this problem is to use interactive media. So, it often makes students feel bored. In the end, students and teachers said that there needs to be an interesting interactive learning medium that makes students interested in learning and understanding physics subject matter.

In research (Fitriyah et al., 2021), the role of e-booklets as a learning medium is one of the effective media to be developed in order to add and develop existing references, and can improve student learning outcomes. However, they suggested that it is necessary to develop e-boklet media on other materials. The development of e-booklet learning media is expected to be effective in helping to improve student learning outcomes towards understanding physical science. Digital learning such as through e-booklets is very helpful in physics learning which can improve student learning outcomes, as well as their understanding (Prahani et al., 2022).

Based on the results of observations and interviews with physics teachers and grade XI students at SMA Negeri 6 Bengkulu City, it shows that the school's infrastructure, including networks, and facilities is quite adequate. However, because during the learning process, printed books are used as the main learning material, so the use of various learning media carried out by students is very limited. According to (Laili et al., 2022), the lack of use of learning media makes lessons less interesting, which has an impact on learning outcomes, and often makes students feel bored. An alternative solution to this problem is to use more innovative learning media. One of the learning media that can make users interested is e-booklets. E-booklets have a small size, the content of the e-booklet teaching media includes material that has been summarized in essence and there are images of personal documentation or from several journal literature that can add to students' insight and summary explanations so that students can easily understand it. Research by (Sipayung & Pratiwi Simanjuntak, 2022) shows that the use of booklets has an influence on the level of understanding of the test results from students. Based on this description, the main problems in this study are: (1) How feasible is the learning media of booklets to improve Student learning outcomes on parabolic kinematics material? ; (2) How to improve student learning outcomes after using e-booklet learning media on parabolic kinematics material? ; (3) How do students respond to the e-booklet learning media to the kinematics material of parabolic motion?. Therefore, a research entitled "Development of e-booklet learning media to improve student learning outcomes on parabolic kinematics material" was conducted.

RESEARCH METHODOLOGY

Research Methods

The research method used in this study is R&D Research and Development using the ADDIE model. Research and development research is based on the problem and research objectives to be achieved. R&D is a method or process to create a new product or develop and improve an existing product which is then used to test the effectiveness of the product (Okpatrioka, 2023). R&D research methods are research methods used to produce new products, test the effectiveness of existing products and develop and create new products. Another source also said that the research and development method is a research method used to produce a certain product and test the effectiveness of the product (Sohilait, 2020). The ADDIE development model is a development model that is structured based on complex and sequential procedures. Where it consists of five stages of development, namely Analyze, Design, Development, Implementation, and Evaluation (Larson & Lockee, 2019).

The product developed in this study is in the form of a learning media in the form of an e-booklet. In its development, this research applies the ADDIE model. The development process takes place sequentially but interactively, the evaluation results of each stage can be used to direct to the next stage (Mufidah & Lestari, 2022). At the analysis stage is the stage to obtain important information from various previous studies as a consideration in making e-booklet learning media, at the design stage is the stage of designing products that are in accordance with the specifications to be achieved and adjusted to the analysis stage, at the development stage is the stage that produces the product according to what

is desired, and at the implementation stage is the next stage which consists of two stages, namely: validation test by validators, and at the stage is the evaluation stage of the learning media that has been developed.

Research Instruments and Stages

According to (Iqbal et al., 2023) A research instrument is a tool used to measure observed natural and social phenomena. In this study, data was collected using interview sheets, questionnaires, pretest sheets and posttests. Where an interview sheet is submitted to the teacher to find out about the needs needed in learning at school, while for students are given a questionnaire to find out whether it is necessary or not in developing learning media. Questionnaire is a data collection technique that is carried out by giving a number of questions in writing to be answered by respondents. Furthermore, to find out the value of student learning outcomes, pretest and posttest sheets that have been validated by experts are needed, and at the end a response questionnaire is also distributed to find out how students respond after using the learning media that has been developed.

In the research on the development of e-booklet learning media, development is carried out in a structured manner with detailed stages. In Sugiyono's book (2019), Robert Maribe Branch (2009) developed Instructional Design (Learning Design) with the ADDIE Approach, which is an extension of Analyze, Design, Development, Implementation, and Evaluation. Analysis Related to analysis activities on the work situation and the environment so that what products need to be developed can be found. Design is an activity of designing products according to what is needed. Development is the activity of making and testing products, Implementation is the next stage which is divided into two steps, namely: validation tests by material experts and media experts, media practicality tests, and Evaluation is the activity of assessing whether each step of the activity and the product made is in accordance with the specifications or not.

Data Analysis

In this study, the test will be carried out by a team of experts, namely lecturers of Physics Education at the University of Bengkulu and teachers of SMA Country 6 Bengkulu City. The expert team will be given a validation questionnaire on the e-booklet learning media that has been developed. The questionnaire was translated into qualitative data using the N-gain formula. N-Gain is used to measure the feasibility level of learning media that has been developed.

The development carried out is the development of e-booklet learning media. The learning media that was developed was first validated by 2 expert lecturers of the Physics Education study program and 1 high school teacher to see the feasibility of the learning media developed. All instruments are equipped with assessment sheets to be validated by experts. Based on its form, this validation sheet is in the form of a closed questionnaire with a type of likert scale that has prepared answers. Data analysis was carried out crantatively using the MS application. Excel 2010, and SPSS to find out the feasibility of this learning media. The analysis of validity data was carried out qualitatively and quantitatively. Quantitative data is obtained from the assessment score provided by the validator, then the data is analyzed by calculating the percentage of the score with the following formula.

$$\text{Validation (V)} = \frac{\text{Total score obtained}}{\text{Maximum score}} \times 100\%$$

The data from the calculation using the formula above will produce a value in the form of a percentage. Furthermore, the value is then interpreted with the qualitative category presented in Table 1. Validity Assessment Percentage Scale.

Table 1. Validity Assessment Percentage Scale

Percentage (%)	Score
0%-25%	Very unworthy
26%-50%	Not eligible
51%-75%	Proper
76%-100%	Very worthy

(Hayati et al., 2015)

This scale is used to measure the level of validation of experts and practitioners towards e-learning media. From the data of this interpretation, biased research is said to be successful and valid or very valid if the questionnaire data processing produces a score between 51%-100% or is within the criteria of "Feasible" and "Very feasible".

Analysis of Student Cognitive Aspect Learning Outcomes

This analysis uses a cognitive aspect test with a comprehension test. The tests given in this study are in the form of Pretest and Posttest. The pretest and posttest values were analyzed using N-<gain>. The results of the N-Gain score are used to determine the level of understanding of students

$$N-<g> = \frac{\text{Posttest Score} - \text{Pretest Score}}{\text{Score Ideal} - \text{Pretest Score}} \times 100\%$$

So that the results of the level of understanding of students from the cognitive aspect after using the e-booklet learning media developed can be found by using the N-<Gain> criterion according to Table 2. to be used as a reference in data assessment (Wahab et al., 2021)

Table 2. Criteria for N- <Gain> level

Average	Criterion
$N-<g> > 0.7$	Tall
$0.3 \leq N-<g> \leq 0.7$	Keep
$N-<g> < 0.3$	Low

The data from the calculation results use N- <Gain> above for research that can be said to be appropriate in medium and high criteria. So that it can be known whether the learning media developed has succeeded in increasing students' understanding of learning outcomes or not.

The analysis of the response was carried out by distributing questionnaires to students. The results of this analysis are concluded quantitatively and qualitatively. The response questionnaire is expected to find out the opinions or responses of students after using the e-booklet learning media developed.

The assessment to fill out this response questionnaire uses the following categories and assessment scores The data from this response analysis will then be analyzed using the following equations:

$$\% \text{ Score Interpretation} = \frac{\sum \text{Scores obtained}}{\sum \text{Maximum score}} \times 100\%$$

(Rahmani et al., 2022)

The data from the calculation using the formula above will produce a value in the form of a percentage. Furthermore, the value is then interpreted with a qualitative category presented in the following table (Melianti et al., 2020).

Table 5. Interpretation of response questionnaire assessment

Percentage	Interpretation
0%-25%	Very bad
26%-50%	Bad
51%-75%	Good
76%-100%	Excellent

Based on the results obtained when the percentage is between 51%-100%, the answer to the response questionnaire is said to be good/very good.

RESULTS AND DISCUSSION

Development of e-booklet learning media to improve student learning outcomes on parabolic kinematics material with R&D (Research and Development) research methods with the ADDIE Approach, by emphasizing the booklet link that is shared, so that you can study the material anywhere so that through the explanation found in the booklet you can improve students' understanding. The stages of research stages of learning media development are explained by the 5-stage method of the ADDIE development model. Analyze, Design, Development, Implementation, and Evaluation.

Result

1. Analysis Stage (Analyze)

The first stage is analysis. Researchers analyze data by conducting field studies and literature studies. Teachers and students of grade XI at SMA State 6 Bengkulu City were interviewed about facilities and infrastructure, learning processes, and policies in schools. The results of observations and interviews obtained are that: (1) Facilities and infrastructure in schools are available. However, it has not been fully used to the fullest; (2) during the learning process, teachers still use printed teaching materials such as books and student worksheets (LKS); (3) The use of learning media is still limited and the learning system is still focused on teachers with lecture methods, so that students are less interested and easily feel bored during learning hours. As a result, students are less active in learning activities. Therefore, many students think that learning physics is boring and difficult to understand. One of them is the kinematics material of parabolic motion; (4) teachers and students said that there is a need for learning media that can help in teaching and learning; (5) Based on school policy, students may be allowed Bring and use a mobile phone during teaching and learning activities, if allowed by the subject teacher in the class.

Based on the problems identified through the results of observation and interviews, it shows that there is an interest in the use of technology-based learning media in the kinematics of satellite dish movements. The literature study shows the suitability of the findings with related research, as conducted by Amelia Prananda 2022 in her research entitled "Development of Discovery Learning-Based E-Booklets to Increase Students' Interest in Learning" showing the results of the average value of students' learning interest at the time before treatment for the experimental class of 65.4 low category and control class 65.2 low category and increased after using the developed learning media.

2. Design stage

After the needs have been identified and analyzed, the next step is to design a product for use in this study. The product designed in the development of this research is an e-booklet learning media that aims to improve student learning outcomes on parabolic kinematics material. The learning media developed is designed to be as attractive as possible in order to attract students as best as possible. At this stage, the researcher made a design of e-booklet learning media which is depicted in the flowchart **Figure 1**.



Figure 1. Flowchart Learning Media e-booklet

3. Develop stage

At the develop stage, development is carried out based on the design that has been designed at the design stage. The characteristics of the learning media are designed with a size of 8.55 x 11 cm and colors that are in accordance with the help of the Canva application, starting from the selection of the type of font and theme that will be used in the product, so that it can produce products that can be used in the physics learning process, especially in the kinematics material of parabolic movement.

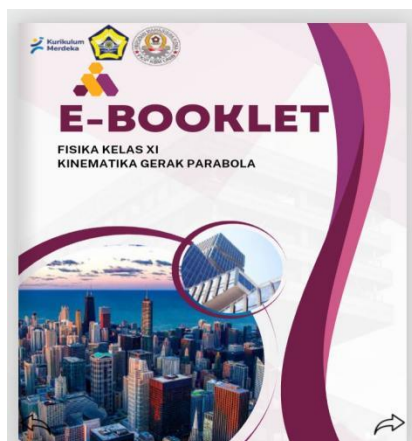


Figure 2. The initial cover view of the e-booklet

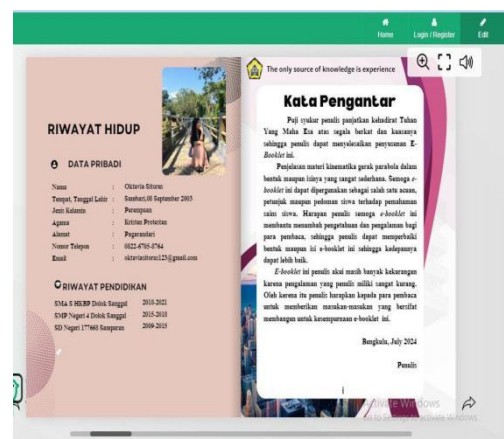


Figure 3. Media introductory view

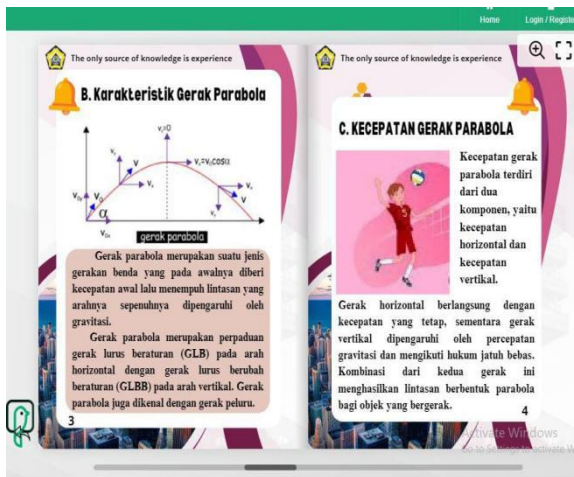


Figure 4. Learning materials

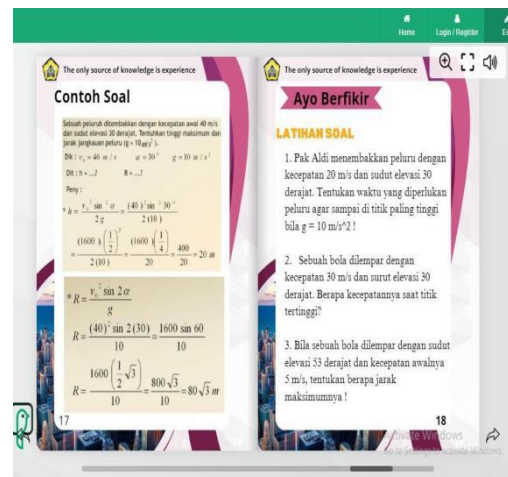


Figure 5. Example display and practice question



Figure 6. Display of the cover of the learning media

Then, this learning media was validated by 3 expert judgements. The purpose of this validation is to find out the feasibility of the product being developed. The following are the results of product feasibility validation in Table 6. :

Table 6. Expert Validation Results

Validators	Scores obtained	Maximum score	Percentage	Category
1	55	68	80,88	Highly Worthy
2	56	68	82,35	Highly Worthy
3	67	68	98,53	Highly Worthy

Based on the results of the validation assessment from experts, the learning media that has been developed obtained a score of 87.26%. Judging from table 1, it can be categorized as very feasible to use. However, in this validation process there are several suggestions for improvement which can be seen in Table 7 below:

Table 7. Product Revision According to Experts

Aspects	Suggestions for Improvement
Image accuracy	Improved images presented with more contrast and clarity
Serving Technique	In more interesting fixes

4. Implementation stage

At this implementation stage, the e-booklet learning media that has gone through the development process and has been validated by experts, was applied to 37 students in class XI D at SMA Country 6 Bengkulu City. At this stage, the researcher collects data by providing the first test in the form of a pretest before using the learning media and the second test through a posttest after the students use the developed learning media. Both tests are used to measure the level of student learning outcomes after going through the learning process by using the learning media that has been developed.

The learning outcomes obtained before and after the use of e-booklet learning media based on the Normalized gain average score formula (1) using the $N\text{-}g$ formula can be seen in **Table 8**.

$$N\text{-}g = \frac{\text{Posttest Score} - \text{Pretest Score}}{\text{Ideal Score} - \text{Pretest Score}} \times 100\%$$

So that the data on N-gain results is obtained as presented in the following table

Table 8. $N\text{-}g$ Test Results Learning Outcomes

	N	Minimum	Maximum	Mean	Std. Deviation
Ngain	37	-.11	1.00	.7685	.23117
Valid N (listwise)	37				

Table 8. The above shows that the $N\text{-}g$ results from Pretest and Posttest obtained a score of 0.77 in the high category, according to table 2 of the N-gain level category. This shows that e-booklet learning media can help improve student learning outcomes on parabolic kinematics material. Then, Shiva's response to the learning media of the e-booklet learning media was obtained from the results of the student response questionnaire. These results can be seen in **Table 9**.

Table 9. Student Response Results

Assessment Indicators	Total Score	Maximum score	Percentage (%)	Average percentage (%)
Media Display	386	444	86,93	89,14
Media Usage	1315	1480	88,85	
Benefit	407	444	91,66	
Categories	Excellent			

Based on the results of the student responses in table 9 above, it was found that the results were 89.14% with a very good category. This shows that most students like learning through the e-booklet learning media that has been developed.

5. Evaluation Stage (evaluate)

The evaluation stage is a process to find out whether the learning media developed is successful and meets expectations in accordance with the goals achieved, which consists of formative evaluation and

summative evaluation. Formative evaluation is carried out in the 4 stages mentioned above, because the goal is the need for revision. In addition, at this stage, it also requires summative evaluation which aims to see the impact or results of the learning media developed after it has been implemented.

Discussion

In the analysis evaluation stage, a review of the learning media development plan was carried out as an effort to overcome the problems found in the results of the previous analysis. This evaluation is carried out to ensure that the planned solution will be successful and in accordance with the needs and characteristics of students. In addition, to evaluate the potential that may be generated towards learning improvement. At the design evaluation stage, the evaluation results were obtained through input from the supervisor which became the basis for improving the quality of e-booklet learning media. By paying attention to these suggestions and inputs, it is hoped that the learning media can be improved for the better, so that it is ready to enter the development stage. The evaluation at this stage of development was carried out through assessments and suggestions from three expert judges in the feasibility test.

The results of these assessments and suggestions are used as a basis for making improvements and adjustments so that the developed learning media can reach the desired standards before entering the next stage. Evaluation of the implementation stage is carried out through the analysis of learning outcomes from pretest, posttest and student response questionnaire results. The improvement of pretest and posttest learning outcomes resulted in an N-gain value of 0.77 in the high category.

Therefore, it can be concluded that the e-booklet learning media is able to improve student learning outcomes on parabolic kinematics material. Overall, students gave a good response with the results of the response questionnaire of 89.14% with the category of very good.

The product that has been developed, namely e-booklet learning media on parabolic kinematics material, has succeeded in supporting students in parabolic kinematics material. This is shown by a high N-gain score, which is 0.77 and the student response was obtained as a percentage of 89.14% in the very good category. Therefore, the product that has been developed, namely e-booklet learning media to improve student learning outcomes on parabolic kinematics material, is considered very feasible and good to be applied in physics learning with the aim of increasing the achievement of student learning outcomes.

CONCLUSION

The e-booklet learning media developed to improve student learning outcomes on parabolic kinematics material has been validated by experts and obtained a result of 87.26% with very feasible criteria to be used in learning physics in parabolic kinematics. As for using this learning media, the student response results were 89.02% with very good criteria. According to the percentage results, the e-booklet learning media has a very good response from students as media users. The learning media developed can improve student learning outcomes in parabolic kinematics material because an N-gain value of 0.77 was obtained in the high category based on the results of the pretest and posttest that have been carried out. Thus, the use of e-booklet learning media developed can be a solution to improve student learning outcomes, on satellite motion kinematics material and get a positive response from students as users of the developed learning media. In this study only focuses on measuring the improvement of learning outcomes in the cognitive realm, it is recommended to continue further research that includes other aspects such as affective and psychomotor.

Acknowledgments

The author is very grateful to God Almighty for the completion of this research and the author also thanks his mother and family who always support the author's education. Of course, the author would like to thank the MBKM Research program of the Physics Education Study Program as well as the supervisors and support from the author's friends.

References

Adlin. (2019). Analisis Kemampuan Guru Dalam Memanfaatkan Media. *Jurnal Imajinasi*, 3(2), 31–35. <https://doi.org/10.26858/i.v3i2.12961>

- Asma, F. N., Fitriyawany, F., & Mustika, C. R. (2022). Development of Project Based Learning Modules On Materials Static Fluids for Class of XI Senior High School. *Asian Journal of Science Education*, 4(2), 28–36. <https://doi.org/10.24815/ajse.v4i2.28342>
- Fitriyah, I., Wiyokusumo, I., & Le.ksono, I. P. (2021). Pe.nge.mbanan me.dia pe.mbe.lajaran Pre.zi de.ngan mode.l ADDIE. simulasi dan komunikasi digital. *Jurnal Inovasi Te.knologi Pe.ndidikan*, 8(1), 84–97. <https://doi.org/10.21831/jitp.v8i1.42221>
- Hayati, S., Budi, A. S., & Handoko, E.. (2015). Pe.nge.mbanan Me.dia Pe.mbe.lajaran Flipbook Fisika Untuk Me.ningkatkan Hasil Be.lajar Pe.se.rta Didik. *Prosiding Se.minar Nasional Fisika (E.-Journal) SNF2015*, 4, 49–54. <http://snf-unj.ac.id/kumpulan-prosiding/snf2015/>
- Iqbal, M., Rizki, A., Wardani, J. S., Khafifah, N. P., Silitonga, N., & Amirah, R. (2023). Ke.bijakan Pe.ndidikan Te.ntang Pe.laksanaan Me.rde.ka Be.lajar. *Journal on E.ducation*, 5(2), 2257–2265. <https://doi.org/10.31004/joe.v5i2.878>
- Laili, C. N., Mahardika, I. K., & Ridlo, Z. R. (2022). Pe.ngaruh Pe.nggunaan Me.dia Inte.raktif Powtoon Dise.rtai Lkpd Te.rhadap Hasil Be.lajar Siswa Smp. *Jurnal Pe.ndidikan Fisika*, 11(1), 26. <https://doi.org/10.24114/jpf.v11i1.34607>
- Larson, M. B., & Locke.e., B. B. (2019). *Stre.amline.d ID : A Practical Guide. to Instructional De.sign. InStre.amline.d ID (2nd e.d.)*. Routle.dge.. <https://doi.org/10.4324/9781351258722>
- Mahzum, E., Farhan, A., & Ramadhani, E. (2020). The Use of Social Media Instagram as Instructional Media for Physics Toward Student’s Learning Motivation. *Asian Journal of Science Education*, 2(1), 48–55. <https://doi.org/10.24815/ajse.v2i1.14997>
- Mufidah, E., & Le.stari, P. D. (2022). Pe.nge.mbanan Me.dia Game. E.dukasi untuk Me.ningkatkan Pe.mahaman Siswa pada Mata Pe.lajaran IPA Ke.las IV. *Ibtida*, 3(02), 186–197. <https://doi.org/10.37850/ibtida.v3i02.364>
- Okpatrioka. (2023). Re.se.arch And De.ve.lopmen.t (R&D) Pe.ne.litian Yang Inovatif Dalam Pe.ndidikan. *Dharma Acariya Nusantara: Jurnal Pe.ndidikan, Bahasa Dan Budaya*, 1(1), 86–100. <https://doi.org/10.47861/jdan.v1i1.154>
- Paoliana, N., Taufik, M., & Rokhmat, J. (2020). Pe.ngaruh mode.l pe.mbe.lajaran poe. (pre.dict-obse.rve.-e.xplain) te.rhadap hasil be.lajar dan kre.ativitas fisika pe.se.rta didik. *Ge.oScie.nce.E.du*, 1(1), 17–22. <https://doi.org/https://doi.org/10.29303/goe.scie.nce.e.du.v1i1.38>
- Prahani, B. K., Rizki, I. A., Jatmiko, B., Suprpto, N., & Ame.lia, T. (2022). Artificial Inte.llige.nce. in E.ducation Re.se.arch During the. Last Te.n Ye.ars: A Re.vie.w and Bibliome.tric Study. *Inte.rnational Journal of E.me.rging Te.chnologie.s in Le.arning*, 17(8), 169–188. <https://doi.org/10.3991/ije.t.v17i08.29833>
- Rahim, F. R., Sari, S. Y., Sundari, P. D., Aulia, F., & Fauza, N. (2022). Inte.ractive. de.sign of physics le.arning me.dia: The. role. of te.ache.rs and stude.nts in a te.aching innovation. *Journal of Physics: Confe.re.nce. Se.rie.s*, 2309(1). <https://doi.org/10.1088/1742-6596/2309/1/012075>
- Rahmani, Y., Hamdani, D., & Risdianto, E.. (2022). Pe.nge.mbanan Alat Pe.raga E.kspe.rime.n Fisika Dasar 1 Pada Mate.ri Viskositas Fluida. *Amplitudo : Jurnal Ilmu Dan Pe.mbe.lajaran Fisika*, 1(2), 128–137. <https://doi.org/10.33369/ajipf.1.2.128-137>
- Rizaldi, D. R., Jufri, A. W., & Jamaluddin, J. (2020). PhE.T: Simulasi Inte.raktif dalam Pe.mbe.lajaran Fisika. *Jurnal Ilmiah Profe.si Pe.ndidikan*, 5(1), 10–14. <https://doi.org/10.29303/jipp.v5i1.103>
- Sipayung, M., & Pratiwi Simanjuntak, A. (2022). Pe.nge.mbanan Bookle.t Angiospe.rmae. Taman Kota Me.dan Se.bagai Sumbe.r Be.lajar Mate.ri Plantae. Untuk Ke.las X Sma. *Journal of Compre.he.nsi.e. Scie.nce. (JCS)*, 1(5), 1120–1132. <https://doi.org/10.59188/jcs.v1i5.144>
- Sohilait, E.. (2020). *Me.todologi Pe.ne.litian Pe.ndidikan Mate.matika*. Pustaka Ramadhan . Bandung:Cakra.
- Yana, B. A. I. W., Kholisho, Y. N., & Fathoni, A. (2018). Pe.nge.mbanan Me.dia Pe.mbe.lajaran Be.rbasis Vide.oTutorial Inte.raktif Pada Mata Pe.lajaranTe.knik Animasi 2 Dime.nsi. *Jurnal Pe.ndidikan Informatika*, 2(2), 52–58. <https://jurnal.une.j.ac.id/index.php/fkip-e.pro/article./vie.w/21703>