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Developing Nearpod E-Media Through Model Discovery to Improve Learning Independence for Elementary School Students

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Abstract: This development research aims to prioritize and develop Nearpod E-Media through Model Discovery to increase the learning independence of fifth grade elementary school students. Collecting data using observation techniques, interviews, and questionnaires. The data analysis in this study is the validation of the E-Media Nearpod product and the t test and N-gain test to measure the effectiveness of the product in increasing learning independence. From the validation results by material expert validators, a score of 85% was obtained in the very feasible category, while media experts obtained a score of 84% in the very feasible category. E-Media Nearpod through Model Discovery was applied to the experimental class which opened 57 fifth grade elementary school students in the Jatiharjo Village area, Grobogan Regency. The results of the product effectiveness test, obtained the N-gain criterion of 0.32, while the use of Nearpod E media through the Discovery Model is effective in increasing student learning independence. It is concluded that the research on the development of Nearpod E-media through the Discovery Model in learning is very feasible and effective in increasing student learning independence.

Keywords: Development, e-media, nearpod, discovery, independence

1. Introduction

Existing global conditions require students to have independent characters because they have to learn on their own to adapt to existing conditions. This is what makes the teacher as a learning facilitator to be able to design interesting, innovative and effective learning. One thing that can be done is by choosing the right learning media (Sofiyati, Suad, & Surachmi, 2021). By choosing the right media, it can be an intermediary between the material being studied and the learner or students.

Various types of media can be chosen by the teacher, one of which is E-media. E-media is currently an alternative that can be used by teachers in learning. The selection of this type of media is the right time for online learning because it can present information or learning materials online. This happened during a pandemic because of the outbreak caused by the corona virus. With the existing conditions, students must continue to study online so that teachers must be willing to improve to arrange online learning, including preparing the right media.

Selection of the right E-media can make learning successful. According to (Mustika, 2015) the position of the media is very important and determines and helps teachers and students in the learning process. According to him, basically this media is an intermediary that can bridge learning materials from various learning sources delivered by teachers who act as messengers to students as recipients of messages to achieve learning goals.

Various E-media that can be utilized and developed are very diverse. There are applications such as Zoom meeting or Google meet for a synchronous online learning process. Electronic teaching materials such as android-based applications and LMS can be used for asynchronous online learning. To make applications vary depending on interests, including in media development. Applications can also be packaged in an integrated manner from various applications that support each other. Meanwhile, in this study, it is described and discussed about the development of learning through the Nearpod E-media application.

In addition to the importance of media, teachers must be able to choose a learning model. Many learning models can make students actively study independently. One of the models that interests the author is the Discovery Model. This model remains relevant to the modern era. Through this model, teachers must improve collaborative skills that can be learned through the Discovery model (Slamet et al., 2021). This collaborative ability is one of the 4C abilities where students and students complement each other, so there is also interaction between teachers and students. With this model students learn in a systematic, structured, directed, and independent manner through scientific activities and tasks that train independent learning.

The learning syntax of the Discovery Model according to (Saputro, Indrowati, & Probosari, 2012) is: stimulation (providing stimulation), problem statement (question/problem identification), data collection (data collection), data processing (data processing), verification (proof) and generalization (draw conclusions/generalizations). This step must be carried out sequentially and systematically because it must be procedural and consists of axioms that can be applied practically by teachers to teach students. The implementation of the Discovery Model is collaborated with E-media such as Nearpod E-media so that it can be applied in online learning. Students can freely learn to study online via the internet with mobile devices or laptops (Huda et al., 2019). Android phones or the like can be used for self-study and self-study. This is unavoidable, for that teachers need to direct positive activities in utilizing existing cell phone facilities for learning activities. This is in line with the results of research conducted by Zuliyanti et al. (2021) which states that 83% of students need educational games in the 4.0 era with the discovery learning model, the data was obtained based on the results of survey research on elementary school students in Kembang Jepara. Likewise, the results of research conducted by Widiyatmoko et al. (2021) stated that android-based learning with smartapps creators can improve critical thinking skills of elementary school students effectively.

Increasing independence is also influenced by the type and learning style of students. According to the opinion of (Vioreza, 2017), in his research, it is stated that there are two types of cognitive learning types. The first type is Field Independence (FI), while the second is Field Dependence (FD). FI learning type is a type of learning that is independent without having to always be accompanied and influenced by others, while FD is a type of learning with the characteristics of students willing to learn if there is an invitation or influence from others so it is difficult to be separated from the help of others. Of course, the right strategy is needed from the teacher to foster independence because independence is very important for the achievement of learning success (Amin et al., 2021).

Based on the results of the needs analysis of elementary schools in the Jatiharjo Village area, Grobogan Regency, it was found that appropriate learning media were needed to increase student learning independence. This is relevant to the conditions in which learning must take place online. Meanwhile, the selection of theme 7 is about events in life and the content of science subjects because it is related to students' daily lives. From the results of observations, interviews and student learning outcomes document data, several problems were found and from the needs analysis obtained information that namely: the media used in the learning process was not effective and less attractive, the learning managed by the teacher seemed conventional and monotonous, needed the development of E-learning. Media to adjust to the progress of science, and low student learning independence.

This research is also supported by the results of previous research by Zulfikar & Tamrin (2019) entitled "Development of Mathematics Modules with a Metacognitive Approach to Facilitate Independent Learning of Students of SMK Muhammadiyah Kupang". The results of the validation of media and material assessments on the "mathematical module with a metacognitive approach" are said to be very valid with an average of 3.4. Teaching materials are very suitable to be used as teaching materials. The results of the development of the module with a metacognitive approach can also be seen from the student's response, namely the student response questionnaire which states that the average is 3.58 and can be categorized as getting a very good response from students. Because the average student response is very good, the module developed can be declared successful based on the responses of class X students at SMK Muhammadiyah Kupang with a total of 20 students.

Based on this research, to increase the low level of student learning independence in this development research, it was attempted to apply Nearpod E-media through Model Discovery. With the need for E-media in accordance with current conditions and some of the existing characteristics, the authors chose the development of E-media Nearpod to increase student learning independence. The characteristics of Nearpod E-media include being operated with a computer via the web, which requires internet access. Another advantage is that it is flexible because it can be accessed anywhere, with a state of having an internet network, can be used for interactive learning and can be operated on cellphones or PCs that are used independently by students. Its utilization is not limited to space and time.

2. Methodology

This study uses a Research and Development (R&D) model design or research and development. According to Sugiyono in Kusumayadi (2020) it was stated that this research model is the research that produces a product that is widely used and functions in the community after testing the effectiveness of the product and conducting research to test the product.

In this study, the product developed is E-Media Nearpod which is applied through the Discovery model in learning the theme of events in life to increase students' learning independence. To test the feasibility of the product, product validation activities are carried out which later if declared feasible can be used for learning on a wider scale. The Nearpod

E-Media platform already exists and many are already familiar with and using it. However, to be used in learning, it must be adjusted to the level of education and relevant materials so that the product development can actually be used practically (Fathurohman et al., 2019).

The procedure in this development research adopts the opinion of Borg and Gall in Mubasiroh (2013). In his book entitled Educational Research, the steps involved in this development research are: 1) Observation and Information Gathering; 2) Planning; 3) Implementation (Product Draft Development); 4) Consolidation; 5) Product assessment by experts; 6) Initial product improvement and refinement; 7) Assessment of research products; and 8) Final Product Improvement.

2.1 Data Source

In this study, the data sources came from teachers and students of Class V elementary schools in the Jatiharjo Village Area, Grobogan Regency in the 2021/2022 school year. There is a research sample with three experimental classes with 57 students and one control class consisting of 10 people. With the support of respondent data from material experts and media experts, validation or feasibility tests can be carried out on the development of E-Media Nearpod. For data collection techniques, this research was carried out in two stages. The first stage is validation, while the next stage to determine the effectiveness of the product is a practical stage with implementation in learning through the Discovery model. At the beginning and end of the activity, observations were made to compare the initial results of student learning independence with the final results of student learning independence from the experimental group.

2.2 Data Analysis Techniques

For data analysis of the feasibility of the product development, in this study used a validation sheet whose instruments are arranged according to the Likert scale. Referring to the opinion of Riduwan in Sukariasih et al. (2019), the Likert scale is used to regulate the attitudes, opinions and perceptions of a person or group regarding social events or phenomena. Specifically, this has been determined by the research variables. Alternative answers in the Likert scale can use the following criteria: very good (weight 4), good (weight 3), quite good (weight 2) and not good (weight 1). This likert scale is also used to observe students' learning independence whose data will later be used to test the effectiveness of Nearpod E-media through the Discovery model in learning on the theme of events in life in grade V elementary school.

The formula for calculating the validation sheet based on Arikunto's opinion in Marwiyah et al. (2019) is as follows:

$$K = \frac{\sum ni}{N} \times 100\% \quad (1)$$

Where K is the percentage of scores obtained, $\sum ni$ is the number of scores obtained and N is the number of maximum scores.

Furthermore, the results of these calculations are entered into the percentage Table according to the application criteria, namely by determining the highest percentage (%) and the lowest percentage (%) first. If the highest and lowest percentages have been obtained, then determine the class interval obtained 18.75. With this class interval, it is desired that there are four classes, then they are entered into the percentage Table according to the expert assessment criteria as shown in Table 1 below.

Table 1. Criteria for assessment of material experts and media experts

Interval (%)	Criteria
25 < score ≤ 43.75	Not Feasible
43.75 < score ≤ 62.50	Not Worth it
62.50 < score ≤ 81.25	Worthy
81.25 < score ≤ 100	Very Worthy

For the level of effectiveness of product development is calculated using the t test using the Paired Samples T-Test and Test Score (N-gain). According to Hake's opinion in Wahab, Junaedi, & Azhar (2021), the formula for determining N-gain is:

$$g = \frac{S_{post} - S_{pre}}{S_{max} - S_{pre}} \quad (2)$$

Where, g is the N-Gain, while S-post stands for the Post-test Score, S-pre is the Pre-test Score, and Smax is the Maximum Score. For the classification of criteria and categories can be seen in Table 2 below.

Table 2. Gain index criteria

Score	Criteria	Category
$(g) \geq 0,70$	High	Very effective
$0,70 > (g) \geq 0,30$	Moderately	Effective

(g) < 0,30

Low

Ineffective

3. Results

3.1 Nearpod E-Media Development

At the E-Media Nearpod development stage, the first step is to open the nearpod.com page address on the search engine page, you can use Google, Google Chrome, Microsoft edge or Mozilla Firefox. Next, after logging into the Nearpod portal, please choose to register (Sign up for FREE) as a teacher (Teacher). Prepare an active google email to register; (2) Click register with an active google account/email (Sign Up with Google). To register with a google account approval is required as shown in the following image. Check the box "I agree to Nearpod ...", then click "Sign Up". If you have successfully registered with Google, then select the rules or account type. Because we are teachers, we are chosen as teachers. The registration process is complete, a window will be directed to the Nearpod Home page. Pay attention to the initial instructions for use.



Figure 1. Home menu of Nearpod

Next select my lessons and create for the development process. Select untitled lesson and select the add slide button. Followed by selecting content or activities. If we select the activities and the collaborate board menu, a menu of activities that we can develop appears. If the collaborate board has been selected, a menu will appear. Fill in the topics or sub topics discussed on the "Enter Topic" menu. Fill in the description or description of the material discussed in the "Enter description" menu. Choose a display style click "choose a style". Next to save click "Save".

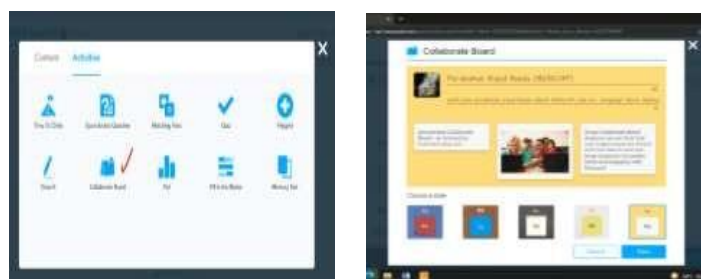


Figure 2. Contents of the menu or activities and the collaborated menu board

To use it in learning, for example on the topic of Theme 7 (IPA course: Changes in Objects), the results can be seen in the preview. Once created, it can then be seen in the preview menu as follows. To write orders to students, they can write on the toolbar "share throughs and/or image here" and then send it, click "post". Students will later read what we sent and students can respond.

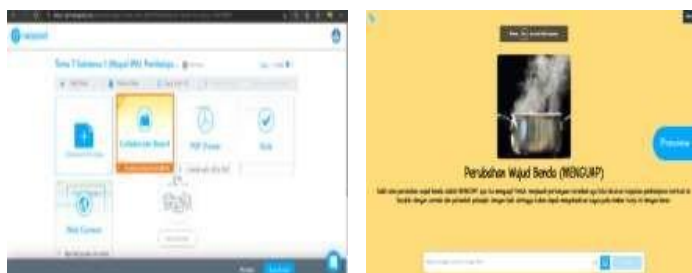


Figure 3. Collaboration board menu preview

Teachers can develop various activities and add questions or quizzes as well. When finished, don't forget to specify the correct answer key and click save. If you have finished developing content, the next step is to share the content that has been created with students. To share the content that we have created, three type can be selected, namely the first directly combined with the zoom meeting application click "Live Participation + Zoom", the second directly without virtual interaction "Live Participation" and the third is daring to be asynchronous by selecting " Student Speed". The Student-Paced option is adjusted to the student's condition indirectly but students can choose the time to complete the content given freely. It is also possible to edit the developed content again before it is submitted by selecting the "Edit" button. To see the display, click the "Preview" button. Furthermore, if you are sure and finished, E-Media Nearpod can be assigned to students by choosing one type, namely "Student-Paced". The display can be seen in the following image.



Figure 4. Content sharing method menu

The teacher then shares the content code through various platforms such as email, social media, links, URLs, google classroom, and Microsoft Time. The easiest way can be shared via the link (link) provided. This link can be shared via WAG, Telegram and Discord. To see whether the progress has been opened and done by students, you can click the "View Progress" button. Teachers can monitor the results of student work. If it is still not good, it can be repeated again so that it can be improved. The teacher can provide a final evaluation to measure students' ability to solve problems. Questions can be in the form of multiple choice, filling and description.

3.2 Results of Development of Teaching Materials and Evaluation for Nearpod Content

The teaching materials made for the development of E-Media Nearpod are designed by taking into account competencies, materials, worksheets and formative tests and other completeness. After it is made, it is continued to make the cover of teaching materials that are designed in such a way, make a design for the author's description, write a preface, write a table of contents for teaching materials and create a concept map design.



Figure 5. Cover design for teaching materials

The development of the content of teaching materials, consisting of learning I, learning II and so on up to learning V. This page contains the subject matter studied, basic competencies, indicators, time allocation and learning objectives. On page 2, we enter into the material which contains a brief presentation of the initial knowledge to go to the next activity. The next page is a worksheet. On this page consists of experimental activities that must be carried out by students with

the steps of the discovery model. The contents of this worksheet include: 1) Simulation; 2) Problem Statements; 3) Data Collection; 4) Data Processing; 5) Verification; and 6) Generalization. Here's how it looks.



Figure 6. Design of teaching materials and worksheets

On the formative test page, questions that have been made are displayed with answer keys and assessment guidelines. In addition, this teaching material is also equipped with a final evaluation. The closing section is equipped with a bibliography, while the cover or final page is equipped with a biography of the author.

3.3 Validation Results of E-Media Development (Nearpod)

Validation by material experts is carried out with the aim of assessing the developed media regarding the material to experts (lecturers, educators are prioritized in the field of education). The steps taken by the material expert validator consisting of academics and education practitioners assess aspects of learning, aspects of material presentation, and aspects of language and communication. Validation was carried out to find out whether the Nearpod E-media development was suitable for use in grade V at the elementary school level. Based on the results of the material validation carried out, a summary of the results can be seen in Table 3 below.

Table 3. Summary of validation results of e-media (Nearpod) development by material experts

No.	Aspect	Percentage per Aspect	Criteria Information	Achievement
1	Learning	84%	Very Worth it	With Revision
2	Material Presentation	88%	Very Worth it	Without Revision
3	Language and Communication	83%	Very Worth it	With Revision
	Whole	85%	Very Worth it	With Revision

From the table, the overall development of E-Media (Nearpod) shows positive results where the percentage reaches 85% in the very valid category with appropriate information with revisions.

Validation by media experts is carried out to assess the quality of the media developed to experts. The steps taken are media validators filling out instrument sheets related to their experts, media expert validators consisting of lecturers and practitioners or educators who are experts in the field of computerization, with aspects of assessment as follows: navigational aspects (guidance), operational aspects, writing aspects (text), and the display aspect. Based on the results of the media validation carried out, a summary of the results can be seen in Table 4 below.

Table 4. Results of validation of e-media development (Nearpod) by media experts

No.	Aspect	Percentage per Aspect	Criteria Information	Achievement
1	Navigation (Hints)	88%	Very Worth it	Without Revision
2	Operational	85%	Very Worth it	With Revision
3	Writing (text)	83%	Very Worth it	With Revision
4	Appearance	83%	Very Worth it	With Revision
	Whole	84%	Very Worth it	With Revision

The overall assessment by media experts on the development of E-Media (Nearpod) showed positive results where the percentage reached 84% in the very valid category with appropriate information with revisions. The development of

E-media (Nearpod) which contains teaching materials with the discovery model has been validated by experts who are competent in their fields. Validation was carried out by material experts and by media experts.

On several aspects that have been described, briefly the suggestions given by the expert validators include: 1) Add orientation and motivation in learning activities; 2) Relate learning activities to everyday events; 3) Complete the teaching materials with a glossary; 4) Choose a font that has an easy-to-read and contrasting style; and 5) Use attractive colors and visually friendly layouts. Those are some things that have been improved so that E-Media (Nearpod) is getting better. The conclusion from the results of the feasibility of the E-Media (Nearpod) developed is very feasible with a few revisions.

3.4 T-Test (Hypothesis Testing)

To collect data on independence, a practitioner teacher assisted with a student observation sheet containing a structured questionnaire. The initial data collection activity for student learning independence was carried out before the application of E-media (Nearpod) through the Discovery Model in learning in the experimental class, while the final data for student learning independence was after it was applied. From the results of initial observations of experimental class students regarding student learning independence, several results were obtained which can be seen in Table 5 below.

Table 5. Results of observation of independent learning early and final of the experiment class

No	Aspect Independent Learning	Statement Items	Student Learning Independence (Early)		Student Learning Independence (Final)	
			Percentage	Category	Percentage	Category
1	Self-confident	1, 2, 3 and 4	57.46%	Moderate	71.38%	Good
2	Self-motivation	5, 6, 7 and 8	56.36%	Moderate	72.59%	Good
3	Initiative	9, 10, 11 and 12	48.57%	Moderate	69.08%	Good
4	Discipline	13, 14, 15 and 16	67.43%	Moderate	74.67%	Good
5	Responsibility	17, 18, 19 and 20	68.09%	Good	74.34%	Good
			59.59%	Moderate	72.41%	Good

To determine the level of effectiveness of E-media (Nearpod) through the discovery model in increasing student learning independence, an analysis of the results of observations of early learning independence was carried out before learning and the results of observations of final learning independence in the experimental class after learning was carried out. This is done to examine whether or not there is a difference between early student learning independence and late student learning independence in the experimental class, also carried out with a t test using the Paired Samples T-Test. The results of the calculation of the average difference test from the pre-test and post-test to increase student learning independence can be presented in Table 6 below.

Table 6. Test of paired samples t-test data for independence learning early and final of experimental class

Analysis		Initial Condition	Final Condition
Mean		59.58333333	72.4122807
Variance		43.5453869	4.010025063
Observations		57	57
Hypothesized Difference	Mean		0
df			65
t Stat			-15.72875
t Critical one-tail			-1.67252

Based on Table 6, then the decision-making steps for the Paired Samples T-Test test are carried out, namely with a significance level of $\alpha = 5\%$ (0.05) and the test hypothesis, $H_0: \mu_1$ and $H_1: \mu_2$, where H_0 : there is no significant difference between the average early learning independence and final learning independence of experimental class students, while H_1 : there is a significant difference between the average early learning independence and final learning independence of experimental class students, 1 is the average early learning independence of students in the experimental class and 2 is the average of the final learning independence of the experimental class students. With the test criteria that H_0 is accepted if the significance value (Sig.) (0.05) H_0 is rejected: if the significance value (Sig.) $< (0.05)$.

From the existing data, it was obtained that the data analysis had a significant value of sig. (2-tailed) for the initial learning independence score and the final learning independence score in the experimental class with a $-t$ count value less than $-t$ table with sig. $0.00 < (0.05)$ then H_0 is rejected. This means that there is a significant difference between the average early learning independence and final learning independence of the experimental class students.

Based on the results of the data analysis, it can be concluded that there is an average difference between student learning independence before receiving treatment using E-media (Nearpod) through the Discovery Model in learning with the average student learning independence after receiving treatment using E-media (Nearpod) through Model Discovery in learning. The results of students' independent learning abilities before being treated using E-media (Nearpod) through the Discovery Model in learning were lower than the average results of student learning independence after being given treatment using E-media (Nearpod) through the Discovery Model in learning.

3.5 N-Gain Test Results

In addition to hypothesis testing, to further confirm the explanation regarding the discussion of the results of the effectiveness of E-media (Nearpod) through the Discovery Model in learning to increase student learning independence, the N-gain test was carried out by comparing the average percentage of observations of early learning independence and final learning independence from experimental class. The percentage comparison can be seen in Table 7 below.

Table 7. Results of the percentage of independent learning at the beginning and end of the experiment class

Student Learning Comparison	Student Learning	
	Independence (Early)	Independence (Final)
Average percentage of independence	59.58%	72.41%
Highest percentage	68.75%	75.00%
Lowest percentage	51.25%	70.00%

Based on the percentage achievement as presented in Table 6, then a score test (N-gain) is carried out to determine the level of effectiveness of product development. We enter the values in the formula below.

$$\begin{aligned}
 g &= \frac{S_{post} - S_{pre}}{S_{max} - S_{pre}} & (3) \\
 &= \frac{72.41 - 59.58}{100.00 - 59.58} \\
 &= \frac{12.83}{40.42} \\
 &= 0.32
 \end{aligned}$$

From the results of the N-gain calculation, the gain (g) = 0.32 with moderate criteria so that E-media (Nearpod) is effective in increasing student learning independence.

4. Discussion

In the application of Nearpod E-media through the Discovery model in learning Theme 7 science lesson content with the topic of changing objects, teachers can apply the steps of the discovery model which include: 1) Simulation; 2) problem statement; 3) Data collection; 4) Data processing; 5) Verification; and 6) Generalization. Through this learning, new things can be obtained because they have to learn to be independent and brave. With the use of media in the form of E-media Nearpod, you can better understand various features in the form of video links, teaching materials displayed in the form of files that can be downloaded on laptops and cellphones. Moreover, it can be integrated with websites and presences via google doc and boldly done evaluations. Through research, students can finally adapt to existing learning, namely boldly and offline or a combination of both.

The results of the study which contain that Nearpod E-media is also supported by the opinion stated in (Sanmugam et al., 2019) that through a web-based Nearpod that allows students to engage with teachers during learning. Several interactive features can be added in the Nearpod software and materials can be viewed on student devices via the internet. Through the application of Nearpod software and presentation design using Nearpod can support student learning. Based on this, Nearpod introduces teaching and learning methods especially in large classes to encourage interaction and conduct independent learning in students.

The results of research on media that have succeeded in increasing independence were carried out by (Anas & Permatasari Munir, 2020) entitled "Application of Project-Based E-Learning Media on Independent Learning and Understanding of Student Concepts at Cokroaminoto Palopo University". This study obtained results with the

implementation of E-Learning, student learning independence is better than before the implementation of E-Learning. The average result of students before the implementation of new E-Learning was 68.26 or only reached the moderate category, after the implementation of E-Learning, student learning independence increased with an average result of 95.74 or reached the very good category. Based on his research, there was an increase in student learning independence by implementing project-based E-Learning.

For the application of learning through the Discovery model learning there are supporting research results, namely from (Putra et al., 2017) where, from his research it was obtained that by using the discovery learning model as a stage in every teaching and learning activity, it was proven to be able to develop student activity and independence. students in teaching and learning activities in the classroom. Research from Oktaviani (2018) also shows that the Discovery Learning (DL) learning model can improve critical thinking skills and mathematics learning outcomes for grade 5 Public Primary School Number 3 Nambuhan. There is also a study from Haryanti & Saputro (2016) entitled "Development of Discovery Learning-Based Mathematics Modules Assisted by Flipbook Makers to improve Students' Concept Understanding Skills on Triangle Material". From this research, it was found that the development of discovery learning-based mathematics modules assisted by flipbook makers to improve students' conceptual understanding skills on triangle material that is suitable for use by students.

From the comparison of the results in this study with previous studies, it was concluded that the development of E-Media Nearpod through Model Discovery was able to increase the learning independence of fifth grade elementary school students. With results like this with previous studies, where the media through certain learning models can increase student learning independence.

However, the Nearpod E-media research through the Discovery model in learning to increase student independence also has limitations because it is only applied in elementary schools in the Jatiharjo Village area, Grobogan Regency. In addition to only paying attention to the media and effectiveness in student learning independence. If applied in other areas or with different conditions can get different results. However, the results of this study can contribute to the idea that the development of Nearpod E-media through the discovery model can increase the learning independence of fifth grade elementary school students even though it is limited in a certain area. It is hoped that the results of this research can provide inspiration and learning innovations in the same field as well as in different scientific fields.

5. Conclusion

Based on the results of development research in the form of Nearpod E-media, it can be concluded that the product developed in the form of Nearpod E-media after being validated by expert validators obtained very feasible results so that it can be developed and used so that Nearpod E-media is an alternative media that can be used by teachers. in increasing student learning independence. In addition, from the results of the effectiveness test of using the product through the t test and the N-gain score test, it can be concluded that Nearpod E-media through the Discovery Model is effective in increasing student learning independence.

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Conflict of Interest

The authors declare no conflicts of interest.

References

- Amin, S., Murtono, Madjdi, A. H., Ardianti, S. D., & Gung, Y. T. (2021). The Effect of Discovery Learning on Science Learning Achievements for Elementary School Students. *Asian Pendidikan*, 1(2), 54-58. <https://doi.org/10.53797/aspen.v1i2.9.2021>
- Anas, A., & Permatasari Munir, N. (2020). Penerapan Media E-Learning Berbasis Proyek Terhadap Kemandirian Belajar Dan Pemahaman Konsep Mahasiswa Universitas Cokroaminoto Palopo. (Application of Project-Based E-Learning Media on Independent Learning and Concept Understanding of Cokroaminoto Palopo University Students). *Pedagogy: Jurnal Pendidikan Matematika*, 5(1). <https://doi.org/10.30605/pedagogy.v5i1.268>
- Fathurohman, I., Kanzunudin, M., Tamarudin, A., & Cahyaningsih, R. D. (2019, October). Education In Era 4.0 Based On Local Wisdom: Existence Of Value And Technology. In *ICONECT 2019: Proceeding of the 2nd International Conference Education Culture and Technology, ICONECT 2019, 20-21 August 2019, Kudus, Indonesia* (p. 200). European Alliance for Innovation.
- Haryanti, F., & Saputro, B. A. (2016). Pengembangan Modul Matematika Berbasis Discovery Learning Berbantuan Flipbook Maker Untuk Meningkatkan Kemampuan Pemahaman Konsep Siswa Pada Materi Segitiga.

- (Development of Discovery Learning-Based Mathematics Modules Assisted by Flipbook Maker to Improve Students' Concept Understanding Ability on Triangle Material). *Kalamatika Jurnal Pendidikan Matematika*, 1(2). <https://doi.org/10.22236/kalamatika.vol1no2.2016pp147-161>
- Huda, M. N., Mulyono, M., Rosyida, I., & Wardono, W. (2019, February). Kemandirian Belajar Berbantuan Mobile Learning. (Independent Learning Assisted Mobile Learning). In *PRISMA, Prosiding Seminar Nasional Matematika* (Vol. 2, pp. 798-806).
- Kusumayadi, F. (2020). Pengaruh Disiplin Kerja Terhadap Prestasi Kerja Pegawai Pada Dinas Kesehatan Kota Bima. (The Influence of Work Discipline on Employee Work Performance at the Bima City Health Service). *Business Management and Entrepreneurship Journal*, 2(3), 22-32.
- Marwiyah, M., Rusijono, R., & Arianto, F. (2019). The Development Of Cai Based Android In Solar System And Universe Topic For Tenth-Grade. *GeosferaIndonesia*, 4(2). <https://doi.org/10.19184/geosi.v4i2.9824>
- Mubasiroh, S. L. (2013). Pengembangan Buku Pembelajaran Keterampilan Menulis Berbasis Pendekatan Proses Untuk Siswa Sma Dan Ma Kelas XI. (Development of a Process Approach-Based Writing Skills Learning Book for High School and Ma Students Class XI). In *Skripsi*.
- Mustika, Z. (2015). Urgenitas Media Dalam Mendukung Proses Pembelajaran Yang Kondusif. (Developing nearpod e-media through the discovery model to improve learning independence for elementary school students). *CIRCUIT: Jurnal Ilmiah Pendidikan Teknik Elektro*, 1(1). <https://doi.org/10.22373/crc.v1i1.311>
- Oktaviani, W. (2018). Penerapan Model Pembelajaran Discovery Learning Untuk Meningkatkan Kemampuan Berpikir Kritis Dan Hasil Belajar Matematika Siswa Kelas 5 SD. (Application of the Discovery Learning Learning Model to Improve Critical Thinking Ability and Mathematics Learning Outcomes of 5th Grade Elementary School Students). *Jurnal Basicedu*, 2(2). <https://doi.org/10.31004/basicedu.v2i2.137>
- Putra, K. W. B., Wirawan, I. M. A., & Pradnyana, G. A. (2017). Pengembangan E-Modul Berbasis Model Pembelajaran Discovery Learning Pada Mata Pelajaran "Sistem Komputer" Untuk Siswa Kelas X Multimedia SMK Negeri 3 Singaraja. (Development of E-Module Based on Discovery Learning Learning Model in the Subject "Computer System" for Class X Multimedia Students at SMK Negeri 3 Singaraja). *Jurnal Pendidikan Teknologi Dan Kejuruan*, 14(1). <https://doi.org/10.23887/jptk.v14i1.9880>
- Rosyida, A., Mustaji, M., & Subroto, W. (2018). *The Development of Contextual Teaching and Learning-Based Comic as a Learning Media for Elementary School Students*. <https://doi.org/10.2991/icei-17.2018.4>
- Saputro, T. W. D., Indrowati, M., & Probosari, R. M. (2012). The Effectiveness of Guided Discovery Method Application Toward Creative Thinking Skill at The Tenth Grade Students of SMA N 1 Teras Boyolali in The Academic Year 2011/2012. *Pendidikan Biologi*, 4(3).
- Sanmugam, M., Selvarajoo, A., Ramayah, B., & Lee, K. W. (2019). Use Of Nearpod As Interactive Learning Method. *INTED2019 Proceedings*, 1. <https://doi.org/10.21125/inted.2019.2219>
- Sofiyati, Suad, & Surachmi, S. (2021). The Use of Video Media and Quizizz for Learning from Home in Grade VI Public Elementary School 1 Karangasem. *ANP Journal of Social Science and Humanities*, 2(2), 88-92. <https://doi.org/10.53797/anp.jssh.v2i2.12.2021>
- Slamet, Suad, Madjdi, A. H., Arsyad Fardani, & Gung, Y. T. (2021). The Effect of Discovery Model on The Science Learning Outcomes of Class V Elementary School Students in The Wijayakusuma Cluster. *Asian Pendidikan*, 1(2), 47-53. <https://doi.org/10.53797/aspen.v1i2.8.2021>
- Sukariasih, L., Saputra, I. G. P. E., Ikhsan, F. A., Sejati, A. E., & Nisa, K. (2019). Improving The Learning Outcomes Of Knowledge And Inquiry Skill Domain On Third Grade Students Of SMP Negeri 14 Kendari Through The Guided Inquiry Learning Model Assisted By Science Kit. *Geosfera Indonesia*, 4(2). <https://doi.org/10.19184/geosi.v4i2.10097>
- Vioreza, N. (2017). Pengaruh Pendekatan Penilaian Dan Gaya Belajar Terhadap Motivasi Berprestasi Mahasiswa. (The Influence of Assessment Approach and Learning Style on Student Achievement Motivation). *Visipena Journal*, 8(1). <https://doi.org/10.46244/visipena.v8i1.373>
- Wahab, A., Junaedi, J., & Azhar, M. (2021). Efektivitas Pembelajaran Statistika Pendidikan Menggunakan Uji Peningkatan N-Gain di PGMI. (Learning Effectiveness of Education Statistics Using N-Gain Improvement Test in PGMI). *Jurnal Basicedu*, 5(2). <https://doi.org/10.31004/basicedu.v5i2.845>
- Widiyatmoko, A., Utaminingsih, S., & Santoso. (2021). Android-based math learning to improve critical thinking. *Journal of Physics: Conference Series*, 1823(1), 012091. <https://doi.org/10.1088/1742-6596/1823/1/012091>

- Zulfikar, R. N., & Tamrin, M. (2019). Pengembangan Modul Matematika dengan Pendekatan Metakognitif untuk Memfasilitasi Kemandirian Belajar Siswa SMK Muhammadiyah Kupang. (Development of a Mathematics Module with a Metacognitive Approach to Facilitate Independent Learning of Students at SMK Muhammadiyah Kupang). *ANARGYA: Jurnal Ilmiah Pendidikan Matematika*, 2(2). <https://doi.org/10.24176/anargya.v2i2.3887>
- Zuliyanti, N., Fathurohman, I., & Utaminingsih, S. (2021). Analisis Kebutuhan Modul Berbasis Permainan Edukatif Di Era 4.0 Dengan Model Discovery. (Need Analysis of Educational Game-Based Modules in Era 4.0 With the Discovery Model). *Jurnal Prakarsa Paedagogia*, 4(1). <https://doi.org/10.24176/JPP.V4I1.5974>