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# Development of Nearpod-Based Learning Videos in Mathematics Subjects for Junior High School Students

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***Abstract***

*This research aims to develop Nearpod-based mathematics learning media. The model used in this research is ADDIE (Analyze, Design, Development, Implementation, Evaluation). This development research is motivated by the need for media that can answer learning challenges in the pandemic era. This product test was carried out at MTs Negeri Batu City involving 30 students in one class. The data collection technique used in this research is a questionnaire to determine students' responses to media readability. The data from this research is qualitative and quantitative. Qualitative data was obtained from criticism and suggestions from validators. Quantitative data was obtained from validation scores and readability questionnaires. The material expert validation results were 91.67%, which means it is very valid. Meanwhile, the media expert validation results were 94.73%. The media readability test value was 83.6% for the limited test, 83.6%, and 82.00% for the wide test.*

**Keywords:** *Learning Videos, Nearpod, Mathematics*

***Abstrak***

*Penelitian ini bertujuan untuk mengembangkan media pembelajaran matematika berbasis Nearpod. Model yang digunakan dalam penelitian ini adalah ADDIE (Analyze, Design, Development, Implementation, Evaluation). Penelitian pengembangan ini dilatarbelakangi dengan kebutuhan media yang mampu menjawab tantang pembelajaran di era pandemi. Uji produk ini dilaksanakan di MTs Negeri Kota Batu dengan melibatkan 30 siswa di sebuah kelas. Teknik pengumpulan data yang digunakan dalam penelitian ini yakni angket untuk mengetahui respon siswa terhadap keterbacaan media. Data dari penelitian ini berupa kualitatif dan kuantitatif. Data kualitatif diperoleh dari kritik dan saran dari validator. Data kuantitatif diperoleh dari nilai validasi dan angket keterbacaan. Hasil validasi ahli materi 91,67 % yang berarti sangat valid. Sedangkan hasil validasi ahli media 94,73 %. Adapun nilai uji keterbacaan media 83,6 % untuk uji terbatas 83,6 % dan 82,00 % untuk uji luas.*

**Kata Kunci:** *Video Pembelajaran, Nearpod, Matematika*

## INTRODUCTION

The learning process must be carried out well and adaptive. One of them must adapt to the needs and developments of the times. The current era is known as the era of disruption. The era of disruption is a complete change in systems that are considered primitive and replaced with digital technology systems (Benyamin et al. 2021). Digital systems automatically create an era of disruption, especially in the world of education. Because someone must master digital systems that are developing in the era of disruption, if teachers are not able to master them then existing knowledge will be underdeveloped. This is a big challenge for a teacher (Benget, 2019).

ICT-based learning media is very suitable to be applied to support student learning today. Good media will make it easier for students to be interested in learning, and make it easier for students to understand it. One of the technology-based learning media is nearpod. Nearpod is a web-based application that enables an interactive learning environment (Nurhuda & Setyaningtyas, 2022). In this

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case, schools can encourage active learning with material quizzes, quizzes, learning videos, and evaluations. Teachers and students can access this application easily (Sarginson and McPherson, 2021). The urgency of technology-based learning videos is to make them easier to understand, more interesting in the process of providing material, and to obtain maximum results (Daryanto, 2012).

The choice of technology-based learning videos in the form of nearpod was due to considerations of affordability, effectiveness, and reliability (Ami, 2021). The nearpod application has many interesting features to support more interactive learning and can be accessed freely by educators or students from all over without being limited by space and time (Ami, 2021). This platform can be set for synchronous or asynchronous learning, teachers are also given a summary of student evaluation results (Dewi, 2021). Apart from that, the nearpod application is not widely known by the general public, especially in the educational sector (Ami, 2021). The difference that nearpod highlights from other platforms is that the content and learning activities are very diverse with very varied delivery formats (Faradisa, 2021).

The material contained in the nearpod learning media is in the form of social arithmetic. This material was chosen because it is closely related to complex problems in social life related to the use of currency (Beka et al. 2021). Apart from that, there are still many students who experience difficulties in resolving problems related to purchasing prices, selling prices, profits, and discounts (Ramadhany, 2020). Therefore, it is necessary to clearly show students the importance of learning social arithmetic material (Beka et al. 2021).

The results of an interview conducted with Mrs. Umroh Mahfudhoh, M.Pd a mathematics teacher at State MTs Batu City on February 15, 2022, said that the teaching and learning process at this school is carried out distance learning and is also technology-based which is supported by adequate school facilities and infrastructure, Meanwhile, the media used must continue to vary according to the student's environment. Students are more interested when there are new media for learning (Interview with Batu City State MTS teacher).

Based on previous research carried out by Badriyah (2021), the development of a near pod-based online learning model is very feasible and effective for students to use in learning in the very good category at each stage. This can be seen from the pre-test and post-test results which show differences or significance. Based on the description above, researchers are interested in conducting research related to learning videos using nearpod in mathematics subjects. Where previous researchers have not conducted research using nearpod in mathematics subjects. Therefore, the researcher formulated the research title "Development of Nearpod-Based Learning Videos in Mathematics Subjects for Middle School Students".

## RESEARCH METHODS

This research uses a research and development development model called Research and Development (RnD). This research method is a research method used to validate a product or develop a product that is used in learning and education (Sugiyono, 2016). In line with this, research and development is a process for developing new products or improving existing products, and these products can be accounted for (Sohibun & Ade, 2017). It can be concluded that research and development aims to produce a product and develop a product with the hope that it can be effectively used for needs in the world of education and learning by current conditions (Nurhuda & Putri, 2023).

The development research used by researchers uses the ADDIE development model. This development model is used to systematically describe learning development (Purnamasari, 2020). Researchers use the ADDIE model because what is being developed is learning media, not engineering,

so the ADDIE model is suitable for the product development process. Apart from that, the ADDIE model provides a systematic, effective, and efficient learning process structured with learning steps. The ADDIE development procedure has 5 stages, namely: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009).

## RESULT AND DISCUSSION

### Instructional Media

In essence, media is a supporting or auxiliary tool in the learning system. Media should be adapted to the learning process and developments of a particular era so that it can be used relevantly in various situations and conditions for each student. The current situation and conditions make media a basic need so that the learning process can attract students' interest (Nurrita, 2018).

In Arabic, media has the meaning of an intermediary between the sender and recipient in conveying messages. Media is also defined as a tool used to convey or deliver messages from teaching (Arsyad, 1997).

According to Indiana (2011), learning media is a useful tool for teachers and students in the teaching and learning process. Meanwhile, according to the National Education Association (NEA), quoted from Rohani (2019), media is a means that can be used by educators and students as a means of communication in conventional or audio form.

According to Suardi (2018), learning should start from true wisdom which is from the spiritual realm leading to the realm of understanding. This can be obtained through interpreting our senses from the Almighty Creator, and then obtaining what is called knowledge. So the term learning is closely related to learning, teaching, learning, and happens together. It can be concluded that learning is the process of transferring knowledge from teachers to students to achieve curriculum goals.

According to Yusufhadi, media is used as an intermediary to channel a message and stimulate students' thoughts, feelings, and desires to support the occurrence of teaching and learning activities that are deliberate, purposeful, and controlled, which is called learning media (Nurrita, 2018).

In the process of making technology-based learning videos, a teacher must know about the media to be created, how to use the media, the benefits and purposes of the media, types of media, and media innovations that can be developed. This will make it easier for teachers in the process of transferring knowledge. So media can help students' learning process.

According to Umar (2002), the use of media can help increase understanding and absorption of the material being studied. The following will explain the function of learning media.

1. Make it easier for students and teachers in teaching and learning activities.
2. Provides a more realistic learning experience.
3. Students are more interested when learning.
4. Can use all senses.
5. Develop students' interest in learning.

Media development must be adjusted to the goals to be achieved along with the conditions and limited capabilities of the media used. According to Divine (2019), media selection should pay attention to the following characteristics:

1. Suitability of learning media with the stated objectives.

2. Support for the content of learning materials adapted to the level of need as well as other materials that support learning media.
3. Easy to obtain and use media.
4. Availability of time to apply learning media.

**Nearpod**

Filepe Sommer said that nearpod is the parent company of Panarea Digital. Nearpod itself was founded by three entrepreneurs from Florida, namely Felipe Sommer, Guido Kovalskys, and Emiliano Abramzon in 2012. The three of them are supported by a strong team of developers, designers, and businesspeople with experience in the world of education and interactive learning content. Before founding nearpod, Panarea Digital worked with many of the leading companies in the industry, such as Barnes & Noble, Leapfrog, Nickelodeon, Disney, and Grupo Santillana which is the largest publisher in Spain. The reason behind the founding of nearpod was that Felipe and his parents saw that there was a big opportunity for change in the world of education. Teachers and students will be the perpetrators of this big change, accompanied by the role of today's technology as a key in the continuity of the process (Rivero, 2012).

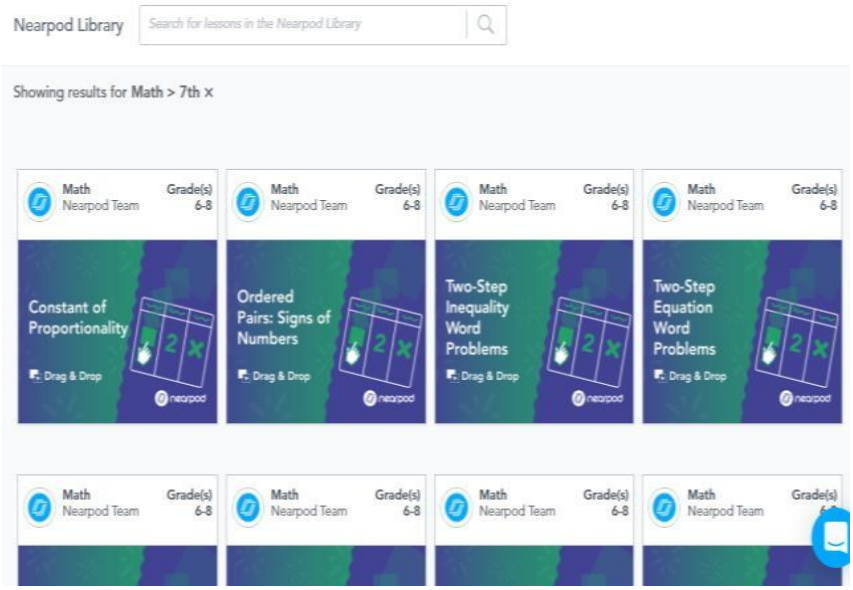


*Figure 1. Nearpod display*

Sarginson and McPherson (2021) say that Nearpod is one of many web-based applications that enable learning environment interactions. Nearpod itself is a cheap, easy, and free interactive tool for student involvement in encouraging active learning with quizzes, polls, gamified activities, interactive videos, and collaboration boards. For each lesson, teachers can assign a code that allows them to log in and join.

**Social Arithmetic**

One of the materials in class VII mathematics is Social Arithmetic. "Social Arithmetic" is material related to the social life of society, especially the use of currency such as buying and selling. In buying and selling there are (Putri & Nurhuda, 2023):

1. Purchase price

   The purchase price is the price of an item directly from the factory, wholesaler, or other place. The purchase price of an item is often also called capital.

2. Sales Price
   The selling price is the price set by the seller that will be offered to buyers.
3. Profit Percentage
   Profit percentage is used to determine the percentage of profit from a sale relative to the capital spent
4. Loss Percentage
   Loss percentage is used to determine the percentage of loss obtained by the seller
5. Discount
   Discounts are price cuts offered by sellers. The aim of giving discounts is to attract buyers' interest so that this method can attract buyers who were initially reluctant to buy (Wijayanti, 2015).
6. Gross, Net, and Tara
   The weight of goods purchased is sometimes still calculated as gross weight, meaning the weight of the packaging is also the weight of the goods purchased. The weight of goods and their packaging is called gross. The weight of the contents without packaging and other things is called Netto. Meanwhile, the weight of the packaging such as sacks, cardboard, plastic, or others is called Tara.

**Analyze**

The first stage is the analysis stage, at this stage the researcher carries out an analysis in the form of needs analysis and problem identification through interviews with class VII mathematics teachers at MTs Negeri Batu City. Structured interviews conducted with mathematics teachers discussed the learning media used in mathematics learning as well as the obstacles for teachers and students in the mathematics learning process in the technological era as well as the use of learning media that can compete in the current era. Meanwhile, an unstructured interview was conducted with one of the class VII students at MTs Negeri Batu City which aimed to find out about learning media in the technological era based on the student's point of view and their needs (Nurhuda & Prananingrum, 2022).

**Design**

This stage includes product design planning, product targets, and product uses that are adapted to the material, learning objectives, and evaluation.

**Development**

The percentage is obtained, and the next step is to describe and draw a conclusion from each indicator. The percentage of eligibility according to Arthawani (2021) is described in Table 3.2 as follows:

*Table 1: Validity Level Criteria*

| Level Achievement (%) | Criteria |
|---|---|
| 85% - 100% | Very Valid |
| 75% - 84% | Valid |
| 65% - 74% | Less Valid |
| 55% - 64% | Invalid |

The researcher will carry out a feasibility or suitability test of the product that has been developed for the validator to validate the product. If the product is declared feasible then there is no need for

revision and if the product has not been declared feasible then a revision will be carried out. However, if the product has not been categorized as suitable, the product needs to be revised again.

**Implementation**

There are two stages of testing at the implementation stage, namely limited testing and extensive testing. Limited trials were carried out on 6 class VII students at MTs Negeri Batu City. Extensive testing was carried out on 30 students of State MTs Batu City Class VII I to determine the suitability and readability of the product at the population level. This stage will determine the feasibility or validity and readability of the media based on student assessments (Nurhuda & Azizah, 2022).

**Evaluation (Evaluation)**

This stage is the process of assessing whether the product is suitable and readable or not in the class VII mathematics learning process, social arithmetic material in the form of selling, buying, profit, loss, discount, gross, net, and tare material. This stage will also determine student responses regarding the media being developed (Nurhuda, 2023a).

Data collection techniques and instruments used in this development research are interviews, validation sheets for media and learning materials, and neared-based learning media readability questionnaires in the form of interviews, validation sheets, and readability questionnaires. The data analysis technique in this research uses qualitative and quantitative descriptive analysis which aims to process the data. Qualitative data analysis was carried out through descriptions of validation questionnaires and student readability questionnaires. Meanwhile, quantitative data analysis was carried out using media validation test questionnaires, materials, and media readability questionnaires.

1. Media and Material Validation Test

   This data was obtained by media experts and material experts through material and media validation questionnaires. These results can be used to determine the validity of the product being developed, and whether it is suitable for testing or not. The following is how to calculate the validation questionnaire for nearpod application learning materials and media (Arikunto, 2021):

$$P = \frac{\sum x}{\sum xi} \; x \; 100\%$$

   Information:
   P: Eligibility Percentage
   $\sum x$: Total Number of Validator Answer Scores
   $\sum xi$: Highest Total Number of Answers

   The data that has been collected is analyzed using quantitative descriptive results with scores and percentages of predetermined assessment criteria. After the data, if the data obtained reaches a score of <60, the development product created can be developed further and needs revision (Arthawani, 2021).

*Table 2. Validity Level Criteria*

| Level Percentage | Criteria | Decision |
|---|---|---|
| 85%-100% | Very good | Product ready utilized in the field |
| 75%-84% | Good | The product is ready to be used without it revision |
| 65%-74% | Pretty good | The product is ready to proceed with revision |
| 55%-64% | Not good | Revise with carefully |

2. Media Readability Questionnaire Test

The readability questionnaire test aims to determine the readability of the product being tested on students. Student readability questionnaire data was analyzed into a percentage. The following is how to calculate the percentage of readability questionnaires for blended learning media (Arikunto, 2021).

$$N = \frac{SP}{SM} \; x \; 100\%$$

Information:
N = Media Readability Value
SP = Number of Aspects of Student Readability
BC = Total Number of Aspects of Student Readability

The percentage level categories of the blended learning media readability questionnaire according to Arthawani (2021) are explained in the following table.

*Table 3. Readability Level*

| Level Percentage | Criteria | Decision |
|---|---|---|
| 85%-100% | Very good | Product ready utilized in the field |
| 75%-84% | Good | The product is ready to be used without it revision |
| 65%-74% | Pretty good | The product is ready to proceed with revision |
| 55%-64% | Not good | Revise with carefully |

**Development of Nearpod-Based Video Learning on Mathematics Subjects for Junior High School Students**

The results and discussion of the initial product development were made in the form of a near pod-based learning video on mathematics for class VII middle school students on Social Arithmetic at MTS Negeri Batu City. This media was developed for class VII MTS Negeri Batu City students by developing nearpod media which can be accessed via cell phones and computers that have an internet connection. This media is classified as interactive media which contains learning videos accompanied by practice questions. This learning media was developed through the nearpod application (Murjazin, Nurhuda, & Aziz, 2023).

The following will explain the research stages in developing nearpod-based blended learning media using the ADDIE model. The results of the needs analysis and problem identification obtained from interviews are as follows. Researchers see that there is no variation in the media used in mathematics learning. Therefore, technology-based media innovation is needed in mathematics learning, so that students can remain enthusiastic and understand more about the mathematics material being taught (Nurhuda, 2023b).

Some teachers and students in the current era more or less know and have skills in the field of technology, at least having a smartphone or laptop so that they can support and facilitate this research. Researchers chose Batu City State MTs as the research location considering that the facilities provided met the criteria for implementing technology-based learning, including LCDs, computer labs, and WiFi in all areas of the school. Based on the results of interviews with class VII students at MTs Negeri Batu City in an unstructured manner, we found data that students need technology-based learning media that can make learning more fun, of course, it can be accessed using cellphones to make learning easier and doesn't have to be in class (Nurhuda, 2022).

The second stage, namely product design. At this stage, the researcher carries out planning to create a product. There are three sub-chapters in media creation. Draft Planning Research This development researcher prepared a draft learning media plan in the form of a syllabus, lesson plans, and learning videos that were adapted to those implemented at MTs Negeri Batu City. These three are used to support the media that will be created. Apart from that, at this stage, the researcher prepared social arithmetic material for class VII SMP along with practice questions which would later be given to students. Designing the product Researchers are designing a nearpod-based learning video media product that will be created. The researcher prepared the nearpod as a process for creating the media contained in it (Murjazin, Nurhuda, Susanti, et al., 2023).

Learning videos are made with the Benime application which contains social arithmetic material along with example questions. Where the video contains an audio explanation of social arithmetic material by the researcher. After that, the learning video is uploaded to nearpod media. This learning video aims to present an explanation of the material in a form that is fun, interesting, easy for students to understand, and clear. Apart from that, learning videos can also be used to replace teachers who cannot be present to provide explanations of more complex material to students. Then, the researcher uploaded the learning video by clicking the upload button on the nearpod menu. The implementation stage after the media is validated by conducting limited trials and extensive trials. This implementation process was carried out on class VII I MTSn Batu City students with 6 students for limited trials and 30 students for extensive trials. The results of a limited trial using a readability questionnaire for development research students received a score of 83.6% in the category of well-readable nearpod-based blended learning media. Meanwhile, the results of the extensive trial got 82.00% with the nearpod-based blended learning media category reading well. This category states that the readability of learning media that has a percentage of >75% is said to be well-read (Arthawani, 2021).

The final stage is evaluation in the form of a product assessment of the process and results of student trials. This stage gets an assessment of validity and readability after being tested based on the questionnaire that has been given. Expert trials get validity assessments from both validators with very valid criteria. Meanwhile, limited trials and extensive trials on students received an assessment of the readability of the media with good criteria, resulting in this media being very valid and well-read. Therefore, this media can be used in the learning process at school. The form of student assessment is in the form of media clarity, suitability and ease of understanding, enthusiasm for learning, curiosity, and student enjoyment when learning with the average student assessment in the good read category.

## CONCLUSION

Based on the development process that has been carried out well regarding the development of nearpod-based learning videos in mathematics subjects for junior high school students, the conclusion is that the development of nearpod-based learning videos uses the ADDIE development model which consists of 5 stages, in the form of:

1. Analysis, at this stage the researcher carries out needs analysis and problem identification to determine the target school environment based on the results of structured and unstructured interviews.
2. Design, at this stage the researcher prepares the syllabus, lesson plans, and learning videos, along with practice questions and designs for nearpod-based learning video media.
3. Development, at this stage the researcher develops a design that has been prepared to become media. Then the media is consulted, revised, and validated by experts. The nearpod media validation results are very valid with a percentage of material validation and media validation from both validators of 94.73%.
4. Implementation, at this stage the researchers conducted limited trials on 6 students and extensive trials on 30 students of class VII I MTS Batu City. The trial was carried out by giving a readability questionnaire to each student. The results of the readability questionnaire test stated that the nearpod-based blended learning media was well read, which was known from the percentage of limited testing of 83.6% and extensive testing of 82.00%.
5. Evaluation, this stage is the stage for assessing the validity and readability of nearpod-based learning videos for students in terms of process and results. The assessments obtained are very valid and read well through the specified grid so that this media can be used in the learning process.

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