

The Development of Microlearning-Based Learning Media in Teaching Planning Subject

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Abstract. This study aimed to develop microlearning-based learning media in the Teaching Plan ning subject, specifically in the material for learning strategies development. The study used Research and Development (R&D) method which aimed to produce a learning video product using the ADDIE development model. The needs analysis was distributed to 101 students in the field of Education in Jakarta. The results of implementation and evaluation showed that media development obtained an assessment of 98.75% from material experts and 95% from media experts, which were categorized as very good and could be used as learning media without any revision. Meanwhile, the result of the one to-one test was 88% and the small group test was 92%, meaning that all scores were categorized as very good according to a predetermined rating scale. Therefore, it can be concluded that the final product developed has been assessed as valid and worthy of being used as learning media in the classroom.

Keywords: Microlearning · Video · Learning · ADDIE · Learning Strategies

1 Introduction

The development of the digital natives generation is the world's current dominating phe nomenon. According to Prensky, the digital natives generations consists of the younger generation who are all "native speakers" of digital computer languages, video games, and the Internet [1, 2]. Meanwhile, universities are known as one of the educational units that are responsive in responding to the rapid influence of technological developments on learning [4]. This is because its learning participants, hereinafter referred to as students, are currently in the age range of digital natives, which is one of the factors that facilitates the application of technology in the learning process in the classroom. [5]. The high level of student satisfaction with the use of digital learning platforms in learning has positive implications for students, so that they are easy to adapt to online-based learning media [6]. This also has an impact on their learning patterns, where they will immediately surf the internet to find answers to questions they do not know in learning [7]. Therefore, one thing

that can be done to address this is that learning is held with a fully self-direct ed, independent, and easily accessible approach via the internet by changing appropriate learning models such as microlearning [8–10]. Microlearning is a learning design that divides the scope of learning into several smaller partitions, so that the information pro vided in the learning process can be learned optimally and the learning process becomes simpler [11]. Microlearning constructs student's knowledge and experience in a short, dense, clear, simple, and easy way [12].

Universities that are included in the teachers training institution (LPTK) are expected to have graduates with orientation of becoming teachers in the future [13]. Therefore, the ability to develop learning implementation plans (RPP) is one of the skills that must be possessed by every student in the field of education or prospective student educators [14]. However, students and graduates who are not proficient in preparing RPP has become a common phenomenon [15]. They found difficulties in determining the basic competenc es, indicators, and even learning strategies in classes [16, 17]. This is reinforced by the results of the pre-research conducted by researchers in Jakarta, on 100 respondents of education program students. It was shown that 67.1% of them found it difficult to prepare lesson plans (Fig. 1) and almost 90% of them complained that they had difficulty in determining learning strategies in the development of RPP. On the other hand, from the survey results, it was found that 90.9% stated that they needed a learning video containing the preparation of lesson plans, especially in developing learning strategies. This is in line with the many research results which stated that learning videos can improve students' understanding of a material [18–20].

Thus, educational program students who are digital natives will be greatly helped if there is a learning video about developing microlearning-based lesson plans that can be accessed online. Therefore, researchers are interested in developing the development of microlearning-based learning media in the Teaching Planning course as a solution to make it easier for students to understand the development of RPP.

2 Method

The research method used is Research and Development (R&D) which aims to produce a learning video product using the ADDIE development model. The ADDIE model is a media design model with a systematic approach in developing text, audio, visual, and computer-based learning materials [21]. ADDIE model can develop instructional models, methods, strategies, and learning materials [22]. ADDIE model has five steps [23] they are (1) analyze, (2) design, (3) development, (4) implementation, and (5) evaluation. Be low is the visual for of ADDIE model's steps:

Needs analysis is carried out to find out the gaps that occur between needs and ideal conditions at the research object [24] triggers a decline in the extent and quality the envi ronment of mangrove forests. The aim to determine the composition of species and struc ture of mangrove ecosystem communities. This research was conducted in the mangrove ecosystem area of Daruba Pantai Village, Morotai Island Regency in September - October 2019. The data collection technique used was the observation method and field sam pling using the transect plot method. Date were analyzed using quantitative descriptive methods for the composition of mangrove species and mangrove community structure



Fig. 1. Model Development of Microlearning-Based Learning Media

Table 1.	Criteria	of score	e interpretation	(Riduan	& Sunarto,	2013)
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Percentage Score	Criteria of Interpretation Score
00%-25%	Very less (cannot be used as a medium and overall revision)
26%-50%	Less (cannot be used yet as a medium with several revisions)
51%-75%	Good (Can be used as a medium with several revisions)
76%-100%	Very Good (can be used as media without any revision)

analysis using formula according to (Bengen, 2001. The data collection method for the needs analysis stage in the development of this research was carried out by distributing questionnaires to 101 students in the field of education in Jakarta. In addition, the respondents involved in evaluating the developed learning media were material experts, learning media experts, and students in the education sector who have taken the Teaching Planning course.

Furthermore, the data is analyzed using descriptive statistics technique. Data anal ysis was carried out after obtaining data from the results of questionnaires distributed to experts and students. The data that has been collected from the respondents was then processed to get a value that can be interpreted, with the following formula:

$$\%Interpretation = \frac{\sum Score\ Obtained}{\sum Maximum\ Score} \times 100\%$$

The score that has been obtained from the assessment by the respondent was quantitative data which was then interpreted into qualitative data by referring to the qualification range of scores as follows:

3 Result and Discussion

The targets of this learning video are students in the field of Education who take teach ing planning courses ranging in age from 19–21 years, where their focus in listening to videos is only around 3–10 min [25, 26]. Therefore, the learning videos were devel oped using microlearning principles, with the duration of each video ranging from 4 to 6 min. The followings were the result of the development process at each stage:

First, the Analysis stage was carried out to analyze the clarification of performance gaps, analyze the needs of the material to be developed, and analyze the media that is suitable and needed by the respondents. This stage was carried out by distributing questionnaires to 101 students in the field of Education, of which 86% were from universities in Jakarta and 14% were from West Java and East Java, who were currently taking or have taken Teaching Planning courses. From the results of the questionnaire, it was found that there were several main needs that had not been met optimally, namely as follows:

Figure 2 shows that as many as 67.4% of respondents thought they find it difficult in preparing the Lesson Plan. Furthermore, respondents were specifically given an openended question that reads "Out of a number of stages in developing a learning strategy, which stage do you think is difficult (state the reason)", and 90% of respondents considered developing a learning strategy to be the most difficult stage. Thus, the respondent's greatest need is the need for an in-depth explanation on how to develop learning strategies.

Wahyudin (2017) argues that learning strategy is the overall general pattern of activities of educators and students in realizing learning events to achieve goals, effectively and efficiently which is formed by a number of activities, including in determining the learning methods and media used that are correct and appropriate. Thus, the material for developing learning strategies can be narrowed down into two main topics, namely about choosing learning methods and learning media that are effective and efficient in achieving learning objectives, and in line to the characteristics of students.

Furthermore, Fig. 3 shows that 77.9% of respondents choose video as a learning medium that suits their learning style. This is in line with the results of previous research which stated that delivering material with learning videos makes the material easy to un



Fig. 2. Respondents answer on Lesson Plan preparation

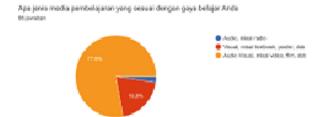


Fig. 3. Respondents answer on learning media

derstand [27]. Therefore, the learning media that will be developed will be packaged in the form of learning videos.

Second is the design stage. This was carried out by formulating learning objectives and creating a platform framework that will be used in delivering the material. The learning objectives formulated must consist of Audience, Behavior, Competencies, and Degrees [28, 29]. Therefore, the formulated learning objectives are:

1. After watching the learning video, students will be able to develop learning strategies through the selection of learning methods that are in accordance with the characteristics of the material presented. 2. After watching the learning video, students will be able to develop learning strategies through the selection of learning media that are in accordance with the characteristics of the material presented.

In addition, at the design stage, the applications and platforms that will be used to create and display learning videos were selected. Microsoft Power Point was chosen based on its level of efficiency and effectiveness in presenting the material [30]. Furthermore, the YouTube platform was chosen as a place to publish material, because YouTube is an effective video-based social media as a forum for displaying learning because it can be accessed by students anytime and anywhere. [31–33] (Fig. 4).

Third, the development stage. At this stage, the researcher developed a video that will be used as a means of delivering material. Video development is based on the principles of utilization and production of learning materials and media. The developed video con sists of two materials that discuss learning media and learning methods. Since it uses the principle of microlearning, each material is made into three parts, namely the beginning, the middle, and the end, with each duration ranging from four to five minutes. The goal is that students can listen to videos lightly, this refers to the results of research which stated that microlearning-based learning videos are effective in improving students' understanding [34, 35]. Below are the detailed descriptions of each video (Table 2).

Fourth, the implementation and evaluation stages. This stage of implementation was not carried out explicitly but was integrated into several evaluation stages, namely validation of learning videos by media experts, material experts, one to one evaluation, and small group evaluation.



Fig. 4. The interface of designing the material using miscrosoft power point as a platform

No	Title of Material	Duration	Purpose of Material	YouTube Links
1	Getting to Know Learning Media (part 1)	4.20"	video, students will be able to develop learning strategies through the selection of learning media and learning methods that are in accordance with the characteristics of the material presented com/watch?v=tZzpOf7HU https://www.youtulcom/watch?v=30tVSxLs https://www.youtulcom/watch?v=30tVVSxLs	https://www.youtube. com/watch?voiW0s RYdUDw
2	Types of Learning Media that Educators Should Know (part 2)	5.43"		https://www.youtube. com/watch?v=tZzpFz Of7HU
3	Tips on Choosing Learning Media (part 3)	3.51"		https://www.youtube. com/watch?v=30tNDS VSxLs
4	Miscellaneous of Learning Method (part 1)	4.24"		https://www.youtube. com/watch?v=kx3WvD X9rxY
5	Is Discussion an Effective Learning Method (part 2)	5.08"		https://www.youtube. com/watch?v=-v5xoSI AMvk
6	Tips on Choosing Effective Learning Method (part 3)	4.28"		https://www.youtube. com/watch?v=deZwRo rcQmw

Table 2. Descriptions of Learning Video Development

3.1 Experts Validation

Material Expert. The material expert who tested the instructional videos was an educational technology expert who is also a training practitioner, named Dr. Jhoni Lagunsiang, M. Pd. In the material test, there were 13 instrument items assessed by material experts on the quality of the material developed, with Likert scaling that has value ranging from 1 to 4, where the interpretation of the assessment of the scale is explained as follows:

- Less, scale 1
- Enough, scale 2
- Good, scale 3
- Very Good, scale 4

Furthermore, of the 13 items assessed, 12 items received a score of 4 and 1 item re-ceived a score of 3. The score obtained from the instrument was then converted into a percentage, which was calculated and analyzed based on the score obtained for each item with the following formula:

$$\%Interpretation = \frac{\sum Score\ Obtained}{\sum Maximum\ Score} \times 100\%$$

The results of the material test conducted by the experts as a whole were worth 98.75% so that according to Table 1 it was categorized as very good. Therefore, the material test was carried out without revision and thus it indicated that the learning videos developed were very good and could be used as learning media without any revisions.

Media Expert. The media expert who tested the instructional video was a researcher and lecturer who taught technology and learning media courses at the Manado IAKN named Dr. Olivia C. Wuwung, M.Pd. In the media test, there were 10 instrument items assessed by material experts on the quality of the material developed, using Likert rating scale with values of 1–4 which same as material experts.

Furthermore, of the 13 items assessed, 8 items received a score of 4 and 2 items received a score of 3. The score obtained from the instrument was then converted into a percentage used the formula of Criteria of Score Interpretation and the results showed that the percentage of the feasibility of the training design model reached 95%, and according to Table 1 it was categorized as very good. Therefore, the media test was carried out with- out revision and thus it indicated that the learning videos developed are very good and can be used as learning media without any revisions.

One-to-one Evaluation Test. In the development and evaluation, a one-to-one test was also conducted on three students of the Business Education Study Program who took the Teaching Planning course.

In the one-to-one test, there were 15 instrument items assessed by students on the qual-ity of the developed video, using Likert rating scale with values of 1–4; where 1 for less criteria and 4 for very good criteria. After being processed with the same formula in the expert test, the evaluation results showed were as follows (Table 3).

The results of the one-to-one test conducted on students as a whole showed that the feasibility of learning videos with learning method materials and learning media stood at 89% and 87%, respectively, so that it was categorized as very good. Therefore, the one-to one test was carried out without revision and and according to Table 1 it was categorized as very good thus it indicated that the learning videos developed were very good and can be used as learning media without any revisions.

Small Group Evaluation Test. In order to deepen the results of the video learning fea sibility test, a small group test was conducted in the Teaching Planning class for the Busi ness Education Study Program students. Students assessed asynchronously by watching videos independently.

Percentage of Interpretation Score			
Initial of Students' Name	Learning Media	Learning Method	
CM	87%	83%	
CT	88%	88%	
DN	92%	90%	
Average Score	89%	87%	

Table 3. Percentage of one-to-one test score

In the small group test, there were 15 instrument items assessed by students on the quality of the developed video, using Likert rating scale with values of 1–4, where 1 for less criteria and 4 for very good criteria. After being processed with the same formula in the expert test, the evaluation results were as follows (Table 4).

The results of the small group test conducted on students as a whole showed that the feasibility of learning videos with learning method material and learning media stood at 92% so that it was categorized as very good criteria. Therefore, the small group test was carried out without revision and thus it indicated that the learning videos developed were very good and can be used as learning media without any revisions.

Furthermore, learning videos were published through Nadya Fadillah Fidhyallah's YouTube channel, so that students can access them anytime and anywhere (Fig. 5).

In addition, each video has a comment column that allows students to ask questions when they do not understand the material or when they require deeper discussion. So, learning can still take place interactively (Fig. 6).

Percentage of Interpretation Score				
Initial of Students' Name	Learning Media	Learning Method		
RH	88%	87%		
AS	90%	94%		
SH	88%	87%		
MA	83%	90%		
UH	92%	90%		
KA	92%	92%		
HA	100%	100%		
BN	94%	92%		
СН	98%	94%		
Average Score	92%	92%		

Table 4. Percentage of Small Group Test Score

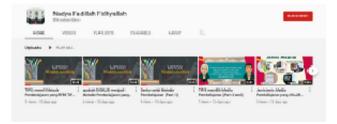


Fig. 5. Display of materials collection on Nadya Fadillah Fidhyallah's YouTube channel

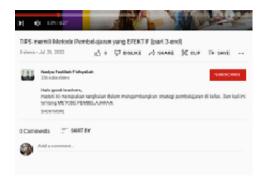


Fig. 6. Comment display in learning video

4 Conclusion and Suggestion

4.1 Conclusion

After going through the research and development process using the RnD method and the ADDIE model, it can be concluded that the final product developed has been assessed as valid and worthy of being used as learning media in the classroom. This is based on the development process that was done according to the development flow and procedures, as well as the results of the development that has gone through the implementation phase of formative evaluation from the material expert test, media expert test, one-on-one test, and small class test. Based on the results of the evaluation, this learning video received an average rating of 97% from experts, 88% from the on-to-one test, and 92% from the small group test, which means that all scores belong to very good criteria based on the rating scale that has been previously determined.

Furthermore, the product of this research is a learning video which consists of two materials, namely learning media and learning methods, where each material consists of three short videos that are connected to the principle of microlearning. Videos can be accessed widely through Nadya Fadillah Fidhyallah's YouTube channel.

4.2 Suggestion

Based on the conclusions described above, some suggestions that can be given include:

- Students in the field of education are expected to be able to access learning videos that
 have been developed in understanding how to choose the right media and methods
 as a series of process in developing learning strategies. Thus, the media and methods
 chosen can be in accordance with the characteristics of students in the class.
- Lecturers who are in charge of teaching planning courses are expected to be able to take advantage of the learning videos that have been developed in providing materials for developing learning strategies in the classroom.
- Further researchers or development who want to engage in similar research are recommended to make better improvements to produce quality, innovative, and creative products.

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