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Development of Self-Learning Media through Digital Literacy in Arithmetic Line Lessons

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ABSTRACT
This research aims to develop self-learning media through digital literacy in valid and practical arithmetic line materials. This research is a research of developers using ADDIE (Analysis, Design, Development, Implementation, and Evaluation) methods. The analysis technique of this study uses validity analysis in the form of score value from validator and teacher response value. And practicality analysis in the form of the value of students' response to self-learning media through digital literacy. The results of this study produced independent learning products through digital literacy. Product feasibility is obtained based on validation tests and practicality tests. Material expert assessments score 80% with a valid classification. The assessment of teacher questionnaire response got a score of 85% with a very valid classification. Based on these results, it can be concluded that self-learning media through digital literacy is feasible to be used.

***Keywords**: Arithmetic digital literacy; Digital self-learning arithmetic; Arithmetic self-learning media.*

INTRODUCTION
The world of education today has entered the era of reform. The development of science and technology encouraged many new learner media. One is with the advent of the internet. With the internet students can obtain a variety of information that supports the activities carried out. In other words, the internet can be used as one of the learning media (Hermawan, 2019). Mathematic is one of the subjects that some students find difficult. Many students are less enthusiastic and lack the spirit to take math lessons, so the results of learning mathematics are usually below average. Another problem that arises in mathematics learning is the use of less media by teachers so that students are difficult to receive abstract material (Umardiyah, 2020).

Media is derived from the Latin medius which literally means 'middle', 'intermediary' or 'introduction' or which leads to two sides. Association for education and communication technology (AECT) defines media that is all forms used for a process of information distribution. According to Yusuf hadi "The media is everything that stimulates the learning process in learners" (Pendidikan & Madrasah, 2017); (Hidayatulloh et al, 2020). Media as one of the components in the learning system that has a function as a means of non-verbal communication. As one component of the system means that the media must exist or must be utilized in every learning. It is said that because if one of the components does not exist then the result will not be maximized (Supriyono, 2018).

Digital literacy is the interest, attitude and ability of individuals who directly use digital technology and communication tools to access, manage, integrate, analyze and evaluate information, build new knowledge, create and communicate with others in order to participate effectively in society (Yahya, 2019); (Wahyuni et al, 2021). Digital literacy is the interest, attitude and ability of individuals who directly use digital technology and communication tools to access, manage, integrate, analyze and evaluate information, build new knowledge, create and communicate with others in order to participate effectively in society.

- Knowledge assembly is the ability to build information from a variety of reliable sources
- Ability to present information including critical thinking in understanding information with a solidity to the validity and completeness of sources from the internet.

- Ability to read and understand information material that is not sequential and dynamic
- Awareness of the importance of convening media and connecting it with networked media (internet).
- Awareness of the access to the network of people that can be used as a source of referral and assistance
- Use filters against emerging information,
- Feel comfortable and have access to communicate and publish information

(Haliq, Abdul & Asih, 2018).

In the world of education, students are one of the users of information. The information students need is not only printed. The Internet began to present information in a different format, namely digital. The information is presented through various facilities provided by the internet such as websites, you tube, weblog, google classroom, mailing list etc. The task is very easy to complete with the development of the internet and digital technology (Silvana & Darmawan, 2018); (Nasrulloh, 2020).

Based on the observations made by researchers at MA Ma'arif 1 Jombang. Students are given the freedom to use digital devices to perform information retrieval processes to answer school assignments. However, in the area school students are not allowed to bring mobile phones except laptops. To support students in seeking information through digital, the school provides Wifi in the library room. It can be concluded that the school has facilitated the learning process by applying digital literacy.

METHOD

The type of research used in this research is research development (R&D) that produces products in the form of learning media (Sugiyono, 2013). The product referred to in this study is a learning tool in the form of a power point that contains a learning video link. This study aims to develop self-learning media through digital literacy in arithmetic line materials of grade XI SMA/MA.

Researchers chose the ADDIE model because the development model is still very relevant to use. Because the ADDIE model can adapt very well under a variety of conditions that allow it to be used today. The level of flexibility of this model in answering the problem is quite high, although it has a high level of flexibility ADDIE model is an effective model to use and many people are familiar with the abbreviation ADDIE (Mustaji & Angko, 2013). ADDIE development model consisting of five stages, namely: Analysis is a learning description of tasks that will be the material or input for the design stage. Design is the input stage will be informed in the specifications for the lesson. Development is the stage at which inputs are used for guidance on selecting or producing lesson materials and activities. Implementation is the stages of teachers, teaching materials, lesson activities and learning using the products produced. Evaluation is a stage to see if the learning objectives are achieved and the problem has been resolved (Dwiranata et al., 2019).

The ADDIE model consists of 5 components that are interconnected and systematically structured. And it is very simple when compared to other design models. The implementation of this research was conducted at MA Ma'arif 1 Jombang. The test subjects in this study were MA Ma'arif 1 Jombang students as many as 20 students. The instrument used in this study is a validation sheet questionnaire with data collection techniques through validation tests conducted by requesting the assessment of material experts and educators. Analysis uses learning media validation criteria, with a very valid validity rate if the presentation is 81% – 100% , valid if the presentation is 61% – 80%, valid enough if the presentation is 41% – 60%, less valid if the presentation is 21% – 40% and invalid if the presentation is 0% – 20%. Determination of validity value with formula of number of scores obtained divided by maximum number of scores multiplied by 100% (Sistyarini & Nurtjahyani, 2017).

RESULT AND DISCUSSION

Regarding the results of the research conducted include the results of validity and practicality of independent learning media through digital literacy in MA Ma'arif 1 Jombang school. These results are through validity analysis and practicality analysis. For more details on these results, the research will be explained in this sub-chapter.

Result

Data presentation includes data results analysis stage (analysis), data results planning stage (design), data results development stage (development), data results development stage (implementation) and data results evaluation stage (evaluation). In this analysis stage consists of several stages, namely the stage of the need for the development of learning media, the material analysis stage, the student

characteristics analysis stage, and the formulating phase of the objectives. Based on the analysis stage conducted by researchers by making observations during PPL activities, the learning media used in mathematics subjects is only printed material media in the form of LKS books and package books that make students less enthusiastic to follow the learning process. Based on these problems, it is necessary to develop more interesting learning media in mathematics subjects. Based on the data obtained, researchers will provide effective solutions by developing self-learning media through digital literacy in arithmetic line materials.

At this stage the media design developed is described in the following stages: (1) Compiling a written storyline to be included in the learning powerpoint. (2) The process of creating learning powerpoints using Microsoft powerponit and video shopper using the writing board application on android (3) The process of making voice recording to make learning videos more lively and uploading learning videos on youtube to make it more accessible. As well as compiling task/practice questions in Google Forms and (4) The next step is to insert a video link into powerpoint.

In the development stage of product design that has been prepared, developed based on the following stages: (1) Researchers edit learning media and given additional learning videos. After that the researchers re-corrected the media development results by asking guidance to the supervisor before it was validated, if it is appropriate then the product is ready to be validated. (2) Validation of the design of learning media is done by media experts and material experts. The purpose of validation is to obtain assessments and suggestions from material experts and media experts on the suitability of the material and the appearance of the media. (3) After receiving input from experts and validated, it is known its weakness. These weaknesses are then tried to be reduced by improving the products developed. The product has been revised and gets a good predicate, then the product is continued to the next stage of implementation.

The data of this development is obtained from the validation of material experts and educators. Based on validity test using instrument assessment sheet validity obtained results in table 1 as follows:

Table 1. Validity test results

No	Validator	Score	Score Count	Presentation Results	Category
1	Material Experts	48	60	80%	Valid
2	Practitioner/Teacher	51	60	85%	Very Valid
Average				82,5%	Very Valid

From table 2, it is known that the average value of the test results of the validity of self-learning media through digital literacy is 82.5% with valid criteria in accordance with very valid categories. This shows that self-learning media through digital literacy is worth using.

The implementation stage is carried out on ma'arif 1 Jombang MA students. During the trial, researchers made notes about the shortcomings and constraints that still occur when the learning media is implemented, in addition students are also given a response questionnaire about the practicality of self-learning media through digital literacy. Researchers also gave questionnaires to practitioners / teachers to find out the teacher's response to self-learning media through digital literacy. Data of this implementation stage was obtained based on the results of product trials on ma'arif 1 Jombang MA students totaling 20 students. The assessment is done by filling out the student response questionnaire after using the learning media. Based on the results of recapitulation of student response data can be stated that self-learning media through digital literacy is practically used in learning.

This evaluation is done to find out if the medium of self-learning through digital literacy in arithmetic line material is in accordance with the initial expectations or not. The evaluation was obtained from the results of the questionnaire response of students after studying arithmetic line materials using independent learning media through digital literacy. Students show good response and are interested in using self-learning media through digital literacy. In addition, students do problem exercises in self-learning media through digital literacy. Evaluation is obtained from valid validation results and questionnaires of student responses after studying arithmetic line materials using self-learning media through digital literacy. Students show good response and are interested in using self-learning media through digital literacy.

Discussion

Learning media has an important role in learning so that in the development of learning media must be precise and in accordance with the needs of learning in order to improve the ability of learners. One of the stages of learning media is validation test. Validation test is conducted as an effort in producing a good learning media and relevant to the foundation of development theory. Practicality test is also important to do that the learning media is practical when used in the learning process.

Based on the results of the analysis of the validation sheet instrument conducted by material experts and educators obtained an average validation value of 82.5% with very valid criteria. This shows that self-learning media through digital literacy is made worthy of use by educators and learners in the learning process. Reviewed from the expert validation results the material is declared valid by the validator with a value of 80%. This shows that the material contained in the self-learning media through digital literacy in arithmetic line materials in accordance with the indicators and learning objectives to be achieved. Self-learning media through digital literacy can make it easier for students to learn and understand materials according to their indicators.

Reviewed from the validation results of practitioners or educators declared very valid with a value of 85%. This shows that the material contained in the medium of self-learning is organized systematically. This shows that the design of self-learning media through digital literacy as a whole has been good and interesting, content layout, cover view, and learning videos.

Overall, self-learning media through digital literacy has met the category of very valid with a value of 82.5%. But still made small revisions to improve the learning media in accordance with the advice given by the validator from the material expert. The revised action is to add aspects of digital literacy. This is done so that the developed learning media can be used well in learning.

In addition, it appears that the response given by students to self-learning media through digital literacy in arithmetic line materials is very good and positive. So that the performance of learners in learning increases and students are able to associate newly received information with actual knowledge and finally be able to overcome problems related to the learning. Therefore, educators need to develop learning media so that the learning process can be more effective and have good learning outcomes. As learners are expected to understand the importance of digital literacy, to be applied in daily life. Especially when the covid-19 protesters can't learn face-to-face. So the medium of self-learning through digital literacy is very helpful for students to learn.

Figure 1. Media developed by researchers

CONCLUTIONS

This research and development produces self-learning media products through digital literacy that is packaged in powerpoint and can be operated on android. The development of learning media is developed with a development model that refers to the design of research and development of ADDIE. This development model uses 5 stages consisting of analysis, design, development, implementation, and evaluation. The material discussed is the arithmetic line. This learning medium consists of several menus that can be operated and help students in learning. There are simulation facilities and tests to support the concept that is done individually as a measure of the success of the expected competency standards.

Based on the results of the development that has been done, the final product of research and development is self-learning media through digital literacy on arithmetic line materials. Research conducted is a type of research development or Research and Development (R&D) using the ADDIE model. The analysis stage is conducted interviews on math teachers in schools to be researched. Interviews are conducted to determine the need for the development of learning media. At the design

stage, material collection is carried out, composing powerpoints and learning videos. The development stage is carried out by media validation to material experts, and practitioners or teachers. Furthermore, the implementation stage is carried out by conducting product trials to students Ma'arif MA 1 Jombang as many as 20 students by giving a questionnaire response of students to the learning media developed. The last stage is the evaluation stage, this stage is done to find out if the media created is in accordance with the purpose or not and see the results of the data of the questionnaire validity and practicality. This research resulted in a product in the form of learning media.

Learning media is packaged in the form of powerpoint. Product feasibility is obtained based on the results of validation tests and practicality tests. Assessments by material experts score 80% with a valid classification or worth using. The results of the teacher response questionnaire scored 85% with a very valid classification or very worthy of use. The results of the questionnaire response of students got a score of 80% with a practical classification. Based on these results, it can be concluded that self-learning media through digital literacy is feasible to use. The advantages of self-learning media through digital literacy in arithmetic line materials are: (1) Learning media can be used by learners anywhere and anytime, (2) The material delivered is easy to understand, (3) the learning media used is interesting, Self-learning media through digital literacy that has been developed has several drawbacks that the prison media can only be accessed if it is entered on a certain google classroom and must go in and out of the learning media.

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