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Development of Digital Information Management Learning Media Based on Adobe Flash in Grade X of Digital Simulation Subject

Sabtu¹*, Kasman Rukun¹, Sukardi¹, Ririt Dwi Putri Permatasari², B.Herawan Hayadi³

¹Master of Technology and Vocational Education, Faculty of Engineering, Padang State University
²STT Ibnu Sina Batam Indonesia
³Universitas Pasir Pengaraian, Riau Indonesia

*sabtu@stt-ibnusina.ac.id

Abstract. This study aims to produce learning media in the form of interactive multimedia that is valid, practical and effective for basic competencies in managing digital information on digital information management subjects. This research is motivated by low learning outcomes and conventional learning on basic competencies in the application and management of digital information in the Department of Software Engineering at Ibnu Sina Vocational School in Batam. The type of this research is development research using the IDI (Instructional Development Institute) model. This model was developed in three stages, namely define, develop, and evaluate to see whether Interactive Multimedia is valid, practical, and effective, this study conducted a one-to-one / individual evaluation expert, large group evaluation, and field testing by looking at learning activities and learning outcomes of students. The results of this study indicate that Interactive Multimedia in the design/media aspect was 91.67% with very valid categories, 91.11% digital content/material management aspects with very valid categories, teacher practices were 92.08% with practical categories, practicalities of students are 91% with very practical categories. Interactive Multimedia effectively improves student learning outcomes is 81.25% (24) gets a value of ≥ KKM and 18.17% (4) students have not reached KKM.

1. Introduction
Various steps and efforts have been made by the government and the private sector to improve the quality of education, such as improving physical facilities and infrastructure, quantity and quality of teachers and learning patterns, renewal and development of educational media and developing curriculum. This is done to achieve the standards set by the government, which is known as the National Standard of Education. National Education Standards according to government regulations of the Republic of Indonesia No. 19 of 2005 article 1 paragraph 1 is "the minimum criteria regarding the education system throughout the jurisdiction of the Unitary State of the Republic of Indonesia"[1]. National Education Standards according to the law of the Republic of Indonesia No.20 of 2003 concerning National Education System article 35 paragraph 2 "consists of content, competency process of graduates, education staff, facilities and infrastructure, management, funding and educational assessment that must be improved on a plan and periodic basis[2].
In accordance with the mandate of Government Regulation Number 19 of 2005 concerning Education National Standards, one of the standards that must be developed is a process standard. Process standards are national education standards for relating to the implementation of learning in an education to achieve graduate competency. The process standard contains the minimum criteria in the learning process in primary and secondary education units throughout the jurisdiction of the Unitary State of the Republic of Indonesia. This process standard applies to the level of primary and secondary education on the formal path, both on the package system and on the semester credit system[3][4].

Standard processes include planning the learning process, implementing the learning process, evaluating learning outcomes and monitoring the learning process for its implementation in an effective and efficient learning process[5].

In national education standards it has been stated clearly that standards must be implemented. However, there are still many complaints from graduates who are not ready to work and do not have competency. This is mainly the low quality of graduate competencies produced. The complaint must be dealt with positively and wisely by educational institutions, especially teachers as curriculum implementers. The teacher has a very important role for success in the teaching and learning process[6][7].

After KTSP (red; Education Unit Level Curriculum), then the Ministry of National Education issued a new idea by making innovations in curriculum changes entitled Curriculum 2013. This is based on facts and public perceptions about the declining quality of attitudes and morals of young people. Therefore in the present era character education curriculum is needed, in the sense that it can be oriented to the formation of character of students, especially in vocational students in the Department of Software Engineering (RPL) which aims to form students capable of mastering competencies in the field of Software Engineering[8][9].

To achieve these goals and objectives, it is very necessary for a learning strategy in the form of a method to deliver learning to students. The learning management strategy is a method for managing interactions between students and organizing in order to deliver the content of the lesson.

To achieve these goals and objectives, a learning strategy is needed in the form of a method to deliver learning to students. The learning management strategy is a method for managing interactions between students and organizing in order to deliver the content of the lesson[10]. According to Miarso, (2009: 460) who explains, “The Learning Process is described in the following pattern:

![Learning Process Diagram]

There are still many of us, teachers, who use pattern No.1, which is giving lessons without using self-developed media. Pattern no.2 teachers began using self-developed media. While in pattern no.3 the teacher uses the available media. In pattern no.4 the teacher shares the task with the media, for example the media presentation on learning materials, while the teacher is to foster the course of learning. In pattern no. 5, there is a learning process (independent, individual and others) using only the media[11].

For that reason, learning requires good communication in delivering messages. The process is usually the content of a subject matter. The message is conveyed by the teacher to students through a
media using certain learning procedures. In today's modern learning system, students do not only act as recipients of messages, but can turn around functions, students act as communicators or messengers. In these conditions, two-way communication will occur. A learning activity is needed by the media to increase the effectiveness of achieving goals / competencies. This means that the learning process will occur if there is communication between the recipient of the message with the giver / distributor of the message through the media used.

This is very contrary to the current state of education, such as in schools that use a lot of expository approaches. This approach is the opposite, that behavior in the classroom and the spread of knowledge are controlled by the teacher so that communication occurs only in one direction. Students as objects that accept whatever is given by the teacher and are only given the opportunity to interact when the teacher asks and students answer. If the creative teacher is usually in providing information and lessons to students the teacher uses tools such as books, pictures, charts, graphs and others that are separate. So that the expository learning system applied in schools is currently less flexible and innovative[12].

2. Method
Research and development is a process or steps to develop a new application or improve existing applications, which can be accounted for. The definition shows that there are systematic steps in the process of developing the application. The steps taken are in accordance with the rules of research so that they can be accounted for.

According to Sugiyono, (2012: 297), the development method (Re-search and Development) are defined as the research method which are used to produce certain products and test the effectiveness of the product.

According to Putra, (2012: 67) Research and Development is research that is done intentionally, systematically, aims, directed to find friends, formulate, improve, develop, produce, test, effectiveness of products, models, methods / strategies / ways, services, certain procedures that are superior, only effective, efficient, productive and meaningful.

3. Result and Discussion
A. UML Design
1) Usecase diagram

![UML Diagram](image-url)

**Figure 2. Interactive Media of Development Design**
4. Development Procedure

The research that will be developed is included in development research or educational research and development (R and D). In the opinion of Borg and Gall (1983: 772), states that “educational research and development (R and D) is a process used to develop and validate educational products.” Development research is a process used to develop and validate educational applications in the initial data collection carried out through observation of interviews and observations made in class when the teaching-learning process takes place in Ibn Sina Vocational School in Batam. Where the use of media is still lacking. Then a plan for making media lessons is prepared, then the supporting aspects in making Learning Media are scarce, by collecting learning materials (curriculum, syllabus and lesson plan), then determining what applications are suitable for use. then after that, it was decided to use the Adobe Flash application as an application used to create learning media for the X grade of students of Ibn Sina Vocational School in Batam. Research Design Learning Media was developed using the IDI model, which consists of 3 stages, namely: define, develop, evaluate. Analysis of design validity and content / material use of Likert scale based on the validation sheet, with steps:

a. Assessments for each of 1-5 data are used with the following provisions:
   - Value 5 = Very Valid
   - Value 4 = Valid
   - Value 3 = Valid enough
   - Value 2 = Less Valid
   - Value 1 = Not Valid
b. Totalling the score of each validator to the total indicator
c. Giving the value of validity is given by the formula:

\[
\text{Validity value} = \frac{\sum \text{Score of Per Item}}{\text{Ideal maximum score}} \times 100\% \\
\text{( Suharsimi, 2008)}
\]

![Figure 3. Display Results of Material Page Design](image1)

![Figure 4. Display of Design Results on the Sub Menu page](image2)

![Figure 5. Display Results of the Evaluation Page Design](image3)
A. Discussion of Learning Media
In media development, there are digital simulation subjects, a series of processes or activities carried out by a learning media that are valid, practical and effective. The learning media development model uses the IDI (Instructional Development Institute) model which includes three stages, namely define, develop and evaluate.

At the define stage, observation, curriculum analysis, analysis of student characteristics, and analysis of reference books were conducted. The development phase is done by designing learning media and validation stages. At this stage a recurring process occurs so that the media can be obtained on digital summarization subjects that are declared valid. Finally, the evaluating stage is limited testing of products developed, practicality tests, and effectiveness test, the following is a discussion of each stage of media development on digital simulation subjects.

1. Define Stage
In this define stage, an analysis of learning media is carried out which consists of curriculum analysis, characteristics of students, analysis of reference books, media used and concepts from learning materials in digital simulation subjects, based on observation data and interviews of teacher and student interviews. Digital simulation lessons require learning media in the form of interactive learning.

2. Develop Stage
a. Media Design
Learning media is designed by considering the content and design contained in it. The contents of instructional media are adjusted to the curriculum and syllabus used in digital simulation subjects. While the design of instructional media is considered in the aspect of the display of media and language / existing on the learning media developed. After the Media is created, then the validation stage is carried out by experts who aim to determine whether the Media is feasible or not.

b. Media Validation
Learning media validation was obtained from the validator's responses to the validity of the learning media developed. Validator consists of 3 lecturers from STT Ibnu Sina in Batam as media design validators who are experienced in the field of computer engineering. From the validator data obtained from the questionnaire, it shows the results of the Media design. Validator who assesses in terms of design, Ririt Dwiputri Permatasari, ST. MSI, Muhammad Ropianto S. Kom.M. Kom and Hanafi, S. Kom. M. Kom, who are lecturers at STT Ibnu Sina in Batam. In the first Validator, the design validator gives an average percentage of 81% with the valid category. Then the validator gives advice. And the design of learning media in terms of content / material was validated by 2 Post-Graduate Lecturers of Padang State University namely Prof. Dr. Wakhinuddin, M. Pd. and Dr. Hansi Effendi, M. Kom on the first validation of the content / material validator gave an average percentage of 83% with the valid category, with input and suggestions from the validator.

In the next validation phase after the Media was revised, the design validator gave an average presetase of 91.50% with the Very Valid category. Media content validator provides an average presetase of 91% with a Very Valid category. With the results of these validations, learning media that are developed are feasible to be tested as learning media on digital simulation subjects.

3. Evaluate Stage
a. Practicality of Learning Media
Data on practicality of learning media was taken at Ibnu Sina of Vocational School in Batam. This trial was conducted to see the implementation of learning by using adobe flash based learning media. In this trial process, there were 3 productive RPL teachers involved, namely Mr. Munas Aditya Raja Gukguk, S. Kom, Ms. Rizky Ameliaiah, S. Kom, Mr. Muhammad Iqbal, S. Kom. The practicality of interactive learning media is taken from the response of students; students become respondents, namely grade of X RPL A of Vocational School Ibnu Sina in Batam.
Assessment of the practicality of learning media is obtained from questionnaires filled in by practitioners / teachers. The response of the practitioner / teacher gives an average percentage of the practicality of the learning media is 92% with the category "Very Practical", as in table 15.

In addition to assessments from practitioners / teachers, The practicality of the media is also assessed based on responses from students through questionnaires and assessment results which can be seen in table 16. Based on the table data of 16 which is based on the aspects assessed, namely the facilitation aspect of 92%, time aspect 92%, from these aspects it can be obtained a percentage of the media's practical average of 91% with the category "Very Practical". Based on the practicality test of the response of practitioners / teachers and students is to be used as learning media on digital simulation subjects.

b. Effectiveness of Learning Media

To see the effectiveness of learning media on digital simulation subjects, it is done using the learning outcomes test. Based on the data obtained from the results of the media effectiveness test, the researcher can explain that 87.18 (28) students get a score above the KKM (KKM ≥ 75) while 12.82% (2) students have not reached the KKM, so it can be concluded that learning carried out using adobe flash-based learning media on digital simulation subjects has been effective.

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