DEVELOPMENT OF ANDROID-BASED INTERACTIVE ELECTRONIC MODULE AS LEARNING SOURCES IN THE HISTORY OF NATIONAL MOVEMENT COURSES IN THE DIGITAL ERA

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Abstract

This study aims to develop an Android-based interactive electronic module as a learning resource for students majoring in history education at the State University of Medan, Indonesia in the National Movement History course. The current digital era requires lecturers to be more creative and innovative in developing learning resources that can reach and attract students who are technology and information literate and proficient. In developing this module, the researcher used the research and development model of the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The advantages of this model are simple, easy to learn and systematic structure. In addition, the researcher also involved experts in the material (content), linguistic, and presentation aspects. The results showed that this module is very feasible, effective and interactive as a learning resource. It can be seen from the results of the first stage the average score of the first stage is 3.48 (good). While the average score of the material expert assessment in the second stage is 4.13, if it is presented then the number is 82.6%, it means that the feasibility value of the product developed based on the material expert's assessment is in the Eligible category.

Key Words

Android Based Modules, Learning Resources, Digital Age, Historical Education, University

1. Introduction

The development of increasingly advanced science and technology encourages the world of education, especially universities to innovate in learning practices by utilizing the products of the results of these technological developments. In the midst of the industrial revolution 4.0 and the digitalization of education, it is necessary to develop learning resources to make them more interesting, interactive and able to achieve their goals. The industrial revolution 4.0 and the digitalization of education cannot be avoided anymore, like it or not, teaching staff must be able to follow it. This is because each generation has its characteristics, so learning resources that are relevant and accommodating to student development are a must. Innovative and diverse learning resources characterize the millennial generation (Y) and Z who are currently pursuing higher education, including history education students. In addition, it is good to familiarize history education students who will later become history teachers, and will deal with a generation that is even more up to date with the development of technology, communication and information. The era of globalization indirectly affects all aspects of life, including the world of education (Priatmoko, 2018; Tjandra, 2020).

Education is a system, as a system, education runs continuously. Education is very much needed in human life, and it is necessary to understand that in fact, teaching

staff need students, not the other way around. If the lecturer holds it consistently and openly, the teaching staff will always think and reflect on the extent to which students or students have benefited from the teaching provided. Therefore, to make quality education and produce quality output, an innovation must be made in the world of education today, one of which is the use of media in the teaching and learning process. Media has an important role in the world of education, one of which can display something abstract into something real to students. The 21st century in the current Globalization Era requires teachers to develop media that are in accordance with the development of Information and Communication Technology (ICT) (Hasibuan et al., 2019).

Innovation of learning materials in the form of interactive electronic modules can replace teaching materials that were previously in printed form such as textbooks, into interactive digital teaching materials. In the 21st century learning perspective, mobile smartphones are easier to use and compatible with learning tasks so that it has a positive impact on student learning motivation (Ismail, 2017). Electronic modules are information and technology (ICT)-based learning materials that are interactive because of the ease of navigation, display of images, videos and feedback through formative tests (Pramana et al., 2020). The results of research conducted by Aprianto et al., (2017) with the article title, Development of E-Learning Module: Historical Culture

Society Based on Local Genius, show that the electronic module of the history of community culture is able to increase students' knowledge of the history of community culture. Therefore, this study aims to develop an Android-based interactive electronic module as a learning resource for students majoring in history education at the State University of Medan, Indonesia in the National Movement History course in the digital era.

2. Research Methods

This study uses the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation). The first stage is Analysis, which is a process of defining what the learning participants will learn (Irvy, 2020). Conduct needs assessment, and perform task analysis (Fernandes et al., 2020). The second stage is Design, which is also known as making a design (blue print) (Afiah et al., 2021). The stages that need to be carried out in the design process are: first, formulating SMART learning objectives (specific, measurable, applicable, and realistic), determining what the appropriate learning strategy should look like to achieve these goals. The design phase is related to targeting, assessment instruments, exercises, content, and analysis related to learning materials, lesson plans and media selection. The third stage, namely, development, this stage is based on the analysis and design phase. the process of making the blue-print or design a reality (Yeh et al., 2019). One important step in the development stage is testing before implementation. The purpose of this phase is to produce lesson plans and lesson materials. The fourth stage is implementation, this phase consists of turning plans into action (Abd Razak et al., 2020). To pass this phase, there are three main stages, namely instructor training, learner preparation and organizing a learning environment. With these three steps, we can present the course very actively and authentically to reach the implementation stage (Aldoobie, 2015). The fifth stage, namely Evaluation, can be carried out in two forms of evaluation, namely formative and summative. Formative evaluations are carried out during and between these phases. The purpose of this evaluation is to improve the learning system that was created before the last version was implemented (Ranuharja et al., 2021). Summative evaluation is carried out after the last version is implemented and aims to assess the overall effectiveness of learning. Evaluation of the learning program aims to find out several things, namely: student attitudes towards learning activities as a whole. Increased competence in students, which is the

impact of participation in learning programs. The benefits felt by the school due to an increase in student competence after participating in the learning program.

The advantages of this model are that it is simple and easy to learn and has a systematic structure (Misesani et al., 2020). As we know that this ADDIE model consists of 5 interrelated components and is structured systematically, which means that from the first stage to the fifth stage in its application it must be systematically applied, cannot be sorted randomly or we can choose which one we think we want to take precedence. Because these five stages/steps are very simple when compared to other design models. It is simple and structured systematically so this design model will be easy to learn by lecturers.

The drawback of this design model is that in the analysis stage it takes a long time (Gunawan, 2017; Kusumawati, 2017; Misesani et al., 2020). In this analysis stage, the designer/educator is expected to be able to analyze the two components of the students first by dividing the analysis into two, namely performance analysis and needs analysis. The two components of this analysis will affect the length of the process of analyzing students before the learning stage is carried out. These two components are important because they will affect the next stage of learning design. Research subjects consist of Material Expert Assessment, Media Expert Assessment and Student Assessment. The data analysis technique used quantitative and qualitative descriptive. Data collection techniques used questionnaires and interviews (Hasudungan, 2020). Data analysis was carried out by comparing the expected amount of data with the percentage obtained.

3. Results And Discussion

3.1 Results

Expert Assessment Of The First Stage Materials

The assessment of the material expert in the first stage is the assessment of the material expert based on the content aspect, the display aspect and linguistic aspect.

Second Stage Material Expert Assessment

Material expert assessment the second stage is the material expert assessment based on the content aspect, the display aspect and the linguistic aspect.

Table 1.1
Content Aspect

No	Indicator	Score	Category
1	The suitability of the material with the learning outcomes	4	Good
2	Material (content) accuracy	3	Passable
3	Up-to-date Material (content)	3	Good
4	Encourage Curiosity	3	Passable
5	Encouraging Critical Thinking	3	Passable
	Total	16	
	Average	3.2	Good

Table 1.2
Language Aspect

No	Indicator	Score	Category
1	Correct sentence structure	3	Good
2	Language compatibility with student development	3	Passable
3	Conformity with language rules	3	Passable
4	Dialogic and interactive	4	Good
5	Communicative	4	Good
	Total	17	
	Average	3.4	Good

Table 1.3
Display Aspect

No	Indicator	Score	Category
1	Consistent presentation of material	5	Good
2	Presentation according to learning objectives	4	Good
3	Presentation requires students to think actively	4	Good
4	Presentation requires students to dig up information	3	Good
5	Presentation of images makes it easier for students to understand	3	Good
	Total	19	
	Average	3.8	Good

Table 1.4
Content Aspect

No	Indicator	Score	Category
1	The suitability of the material with the learning outcomes	4	Good
2	Material (content) accuracy	3	Passable
3	Up-to-date Material (content)	3	Good
4	Encourage Curiosity	4	Good
5	Encouraging Critical Thinking	4	Good
	Total	18	
	Average	3.6	Good

Table 1.5
Language Aspect

No	Indicator	Score	Kategori
1	Correct sentence structure	4	Good
2	Language compatibility with student development	4	Good
3	Conformity with language rules	4	Good
4	Dialogic and interactive	5	Very Good
5	Communicative	4	Good
	Total	21	
	Average	4.2	Good

Table 1.6
Display Aspect

No	Indicator	Score	Category
1	Consistent presentation of material	5	Very Good
2	Presentation according to learning objectives	4	Good
3	Presentation requires students to think actively	4	Good
4	Presentation requires students to dig up information	5	Very Good
5	Presentation of images makes it easier for students to understand	5	Very Good
	Total	23	
	Average	4,6	Very Good

The average score of the material expert assessment in the second stage is 4.13, if it is presented then the number becomes 82.6%, it means that the feasibility value of the product developed based on the material expert's assessment

is in the Eligible category.

Student Assessment Results

Table 1.7
Small Group (Assessment by 4 students)

No	Indicator	Total score	Average Score	Category
1	Ease of material (content) to learn	17	4.25	Good
2	Display according to learning objectives	16	4	Good
3	Display requires students to think actively	16	4	Good
4	Display requires students to dig up information	18	4.5	Good
5	Image display makes it easier for students to understand	17	4.25	Good
6	Display contains character values	15	3.75	Good
7	The suitability of the language with the student's condition	16	4	Passable
8	The language used is communicative	17	4.25	Good
9	The display of the book is interesting to read	17	4.25	Good
10	Readable text size	19	4.75	Very Good
	Total	168	4.2	
	Total Average	4.2 (84%) Proper to use		Good

Table 1.8
Big Group (Assessment by 30 students)

No	Indicator	Total score	Average Score	Category
1	Ease of material (content) to learn	121	4.03	Good
2	Display according to learning objectives	119	3.96	Good
3	Display requires students to think actively	123	4.1	Good
4	Display requires students to dig up information	127	4.23	Good
5	Image display makes it easier for students to understand	125	4.16	Good
6	Display contains character values	122	4.06	Good
7	The suitability of the language with the student's condition	126	4.2	Good
8	The language used is communicative	127	4.23	Good
9	The display of the book is interesting to read	129	4.3	Good
10	Readable text size	123	4.1	Good
	Total	1.242		
	Total Average	4.1 (82%) Proper to use		Good

Fig. 1.1
Prototype on the front page of the Module

Fig. 1.2
Android based module

Fig. 1.3
Android based module

3.2 Discussion

Technological progress has occurred so rapidly and varied, including the development of technology in Indonesia, especially the development of mobile learning. Based on data from e-Marketer, a news agency based in New York, the number of smart phone data users in Indonesia reached 55.4 million users in 2015, and was ranked 3rd in Asia Pacific and it is estimated that in 2016 user data will increase to 65, 2 million and 74.9 million users in 2017 (Rahmayani, 2015). Google ensures that there are currently more than three billion active Android users spread all over the world (Rizal, 2021). 89% of Indonesians use smartphones (Hanum, 2021). Android is the most widely used in Indonesia (Pertiwi, 2021). The digitalization of education is a logical consequence of changing times. No one could have predicted that technology would be adopted so quickly by industry and society. In the context of education, digitalization--or also often referred to as digital transformation, can be interpreted as the ability to change various aspects and processes of education into various digital variants (Ali et al., 2021). The digitalization process will have an impact on various processes in education, especially changes in organizations and transformative leadership. Digitalization is believed to be one of the answers that cannot be avoided anymore and is needed to answer the challenges of education in the future. This includes designing up-to-date learning resources and utilizing information-communication technology, as well as those that are close to students.

The use of media in the learning process is an important need as a means of delivering information to students (Liana et al., 2019). Information and Communication Technology (ICT) is developing very rapidly along with the demands of various human needs. Human life, which is full of information needs, creates dependence on the ICT sector to fulfill it. The presence of

ICT is able to facilitate various human activities such as the field of business, health services, work, daily needs, and including the field of education (Roztock et al., 2019). Technology in education is very important to help lecturers in the learning process in the classroom or anywhere. Technology in education is learning and practice, in accommodating learning and also improving business by using, creating, and managing technological resources and processes (Januszewski et al., 2013). One form of interactive learning media that utilizes smart phones is an Android-based interactive e-module. The android-based interactive module is one of the introductions before learning activities which aims to make students have an initial understanding before learning, students are more prepared and motivated in participating in learning and as a solution to overcome problems in using less effective textbooks, where some students do not read books properly. carefully and take a lot of information that is not important (Satriawati, 2015).

Learning media in the form of teaching materials can be useful for teachers in carrying out learning (Tazkiyah et al., 2020). Android-based smartphone technology is not only used as a communication tool, but can also be used as a learning medium that can present practical teaching materials. A lecturer is not only required to be able to master teaching materials, but is required to be able to choose and use the right learning media in order to achieve optimal learning objectives. Among other things by means of: the use of interactive learning media that is appropriate/suitable to the characteristics of the learning material. The use of information technology-based media in learning requires readiness and planning (Arkorf & Abaidoo, 2014; Mumtaz, 2000). Readiness to use technology-based media, one of which can be seen from school facilities and infrastructure that can support learning.

The term education is basically a process of communication and information from educators to students that contains educational information, consisting of educators as facilitators and as part of information sources, students as learning people, and media as a means of presenting ideas, ideas, and educational materials (Syaparuddin et al., 2020). Important components that act as tools in the learning process are equipment and resources (media) components. However, even though it acts as a tool, this component has a big impact in improving the quality of learning by simplifying the process of delivering learning materials. Sukir (2020) explains that one of the factors that influence the learning system is the existence of learning facilities such as media, learning tools, equipment, which support the smooth learning process itself.

Media is everything that can be used to channel messages from the sender of the message to the recipient of the message so that it stimulates the thoughts, feelings, and attention of students in such a way that the learning process occurs (Mustaqim, 2016). If a media can carry messages or information that has instructional purposes or contains teaching purposes, then the media is said to be a learning medium (Azhari, 2015). Abdullah (2017) explains that good media is media that has interactivity, namely media that can lead to two-way communication. Another important component is the availability of teaching materials that can be used by students.

Nuryasana & Desiningrum (2020) explained that teaching materials are a set of materials that are systematically arranged that can be used by students so as to create a condition that allows students to learn well. In the end, teaching materials are all forms of written or unwritten materials that are used to assist educators (teachers, lecturers, and instructors) in carrying out the learning process in the classroom. Based on these understandings, it can be understood that teaching materials are all forms of material that are specially and systematically arranged, which contain a complete presentation that can help educators or students in creating a more effective learning process.

Android-based learning media can improve students' thinking skills (Yogyanti, 2015). In fact, according to Latifah (2019) that, the use of android-based virtual practicum media has many advantages including: (1) it is

very easy to operate, (2) it has an attractive design and the material presented is simple but easy to understand, (3) there are questions - exercises that are in accordance with SK/KD and indicators of science process skills, (4) there is a virtual laboratory that can be used and equipped with tools and materials to carry out simulation activities or experiments like in a real laboratory, (5) very practical, which can operated anywhere and anytime, (6) does not depend on the data network because it can be played offline.

4. Conclusion

The development of an Android-based interactive electronic module as a learning resource for students majoring in history education at the State University of Medan, Indonesia in the National Movement History course is an important requirement in today's digital era. The current digital era requires lecturers to be more creative and innovative in developing learning resources that can reach and attract students who are technology and information literate and proficient. In order to produce a module product that meets expectations, the development of this module uses the ADDIE research and development model (Analysis, Design, Development, Implementation, and Evaluation). The advantages of this model are simple, easy to learn and systematic structure. In addition, the researcher also involved experts in the aspects of material (content), linguistics, and presentation. The results showed that this module is very feasible, effective and interactive as a learning resource. The module feels more useful during the current pandemic and the changing pattern of learning from face-to-face in class to networked using information technology. It is hoped that further research can integrate online and offline android-based modules and features that are more complete to support history learning at universities. In addition, it is necessary to develop more, especially this android application-based e-module which is more branched out with other subjects. As well as the need for the development of E-modules in other subjects, because this media the preparation or organization of the material is very suitable for independent learning activities and product packaging combined with the development of smartphone, tablet technology, etc. This combination makes it a winning solution in creating independent learning.

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