The Development of Interactive E-Module in PAI to Improve Student Learning Outcomes

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Abstract

This study aims to develop an interactive e-module in Islamic Religious Education (PAI) courses. The research subjects are students who study PAI in the odd semester of the Academic Year 2021-2022 at Medan State University. The method used in this research was R&D. Researchers used the R&D developed by Borg and Gall with the first steps; preliminary research, second; product development planning, third; product validation and revision and fourth; product implementation. Data collection techniques in this study used literature studies and questionnaires. As for the data analysis technique, for qualitative data it refers to the three steps of Miles & Huberman, while for quantitative data it uses an independent sample t test (quasi experimental design). All quantitative data was processed with SPSS version 18 facility. This study resulted a valid and tested PAI e-module which in terms of material scored 86% (valid category), and from media and design terms it scored 93% (very valid category). The use of the PAI interactive e-module has been shown to have a significant impact on student learning outcomes, where the learning outcomes of students who study using the PAI interactive e-module are higher in value than the learning outcomes of students who do not use the PAI interactive e-module.

Keywords: Interactive E-Module, Learning Outcomes, Islamic Religious Education subject

1. Introduction

Today's increasingly sophisticated technological developments have brought humans into the era of the industrial revolution 4.0. This era is marked by the phenomenon of disruptive innovation which emphasizes the pattern of the digital economy, artificial intelligence, big data, robotics, and so on. Facing this phenomenon, the world of education is also required to change. Now changes in study spaces and learning resources are unavoidable. At first the study room in the form of buildings and classrooms has now turned into an on-line study room (online learning). Changes also occur in teaching materials or learning resources. The widespread use of internet classrooms, especially during the current COVID-19 pandemic, requires educators/lecturers to innovate and develop teaching materials. Teaching materials that need to be developed are those that integrate new materials into lecture materials and eliminate out-of-date materials and their presentation

utilizing various educational technology applications that are widely available today. Teaching materials should also be able to solve learning problems by paying attention to the target or students and also adjusting to the competencies that must be achieved. One form of teaching materials that need to be developed in learning is a module. According to Simarmata (2017) a module is a unit of planned learning activities designed to help students complete certain goals by organizing subject matter that is tailored to the individual's own personality so as to maximize his intellectual abilities. The modules are specifically and clearly designed based on the speed of understanding of each student, thus encouraging students to learn according to their abilities. Along with the development of increasingly sophisticated technology and the current transition from print media to digital media, learning modules are also undergoing a transformation in terms of their presentation to electronic form, known as electronic modules or e-modules.

Etymologically e-module consists of two words, namely "e" or "electronic" and "module". E-modules are learning resources that contain materials, methods, limitations and ways of evaluating that are designed systematically and attractively to achieve competencies that are in accordance with the curriculum electronically (Laili, et al. 2019: 309). According to Samiasih (2017: 119) e-module is a computer-based module and contains fragments with questions in each fragment so that users more easily understand the material. The use of e-modules is increasingly popular today because of several advantages when compared to other learning resources, namely printed books and modules. The difference between an e-module and a module is that if the module tends to be monotonous and unable to visualize events/phenomena dynamically and interactively, the advantage of an e-module is that it can insert images, animations, audio, or video so that the e-module is very interesting for students. According to research by Herawati and Muhtadi (2018), e-modules are effective in influencing student learning outcomes and are able to increase student learning motivation.

E-modules can be developed into interactive learning media or known as interactive e-modules. Interactive e-modules are learning materials that contain materials, methods, limitations and ways of evaluating that are designed systematically and attractively to achieve the competencies/sub-competencies of the courses that are expected according to the level of complexity, Imansari and Suryatiningsih (2017:12). According to Kurniawan (2015) interactive e-module is a multimedia in the form of a combination of two or more media (audio, text, graphics, images, animation and video) which is presented in the form of a compact disk (CD) and there is interaction (reciprocal relationship/communication) two or more directions between the media and its users. So an e-module is said to be interactive if the user experiences interaction and is active both paying attention to images, paying attention to writing that varies in color or moves, sounds, animations and even videos and films. Interactive conditions will increase the value of very high communication, as well as form simulations and animations that can arouse

students' enthusiasm for learning.

Based on the above background, research on the development of interactive e-modules in PAI courses at the State University of Medan needs to be carried out to support the direction of 21st century education. The problems that are attempted to be solved in this research are: 1) Is the interactive learning media developed valid and tested? 2) How is the effectiveness of the PAI interactive e-module developed in this study in improving student learning outcomes in PAI courses at the State University of Medan?

2. Literature Review

Islamic religious education is guidance given by someone to someone so that he or she develops optimally in accordance with Islamic teachings (Majid, 2005). Meanwhile, according to Zakiah Daradjat (2006) Islamic religious education is an effort to foster and nurture students so that they can always understand the teachings of Islam as a whole. Then live the goal, which in the end can practice and make Islam as a way of life.

The main mission of PAI is to foster the personality of students as a whole with the hope that someday they will become scientists who believe and fear Allah SWT, have noble character and are able to devote their knowledge to the welfare of mankind (Syahidin: 2009). Several studies have shown that PAI learning is still not optimal, including: 1) PAI learning is still indoctrinating even though Islam is not only a belief system formed by dogmas as historical facts (Nurudin, 2007). 2) PAI teachers still often interpret PAI in terms of memorization and understanding, or only dwell on normative matters (Mulyana, 2013) which are often without illustrations of the socio-cultural context. 3) The implementation of PAI learning in Indonesia has not fully developed strong rational thinking skills and independence (Tan, 2011).

Based on the above, it is urgent to make use of advances in technology, information and communication (ICT) in PAI learning, especially in universities, including making technology-based PAI learning resources. This is in line with the opinion of Giddens (1990) that the use of technology media in Islamic religious learning in this digital era is a must because modernization cannot be avoided. According to Yousif (2001) there is a relationship between information technology and Islam. Although the Qur'an is not a scientific text book, but the Qur'an is a guide that contains general principles that apply throughout time and universal, including instructions that contain universal principles of science which is the main domain of information technology. So that by implementing information technology, especially the internet for Islam, means applying Islamic principles.

1. Development of Interactive E-Modules in PAI Courses

E-module is one of the learning resources that need to be developed in PAI courses. Moreover, during the current covid pandemic, distance learning policies (PJJ) are applied in the world of education which require teachers to be

adaptive, creative and innovative and able to utilize IT in designing interesting teaching materials for students so that they remain enthusiastic about learning.

A module is a book written with the aim that students can learn independently without or with teacher guidance (Depdiknas, 2008). Modules are learning materials that are systematically designed based on a certain curriculum and packaged in the form of the smallest learning unit and allow it to be studied independently in a certain time unit (Purwanto, 2007). Meanwhile, e-module is an electronic version of the module where the access and use is carried out through electronic devices such as computers, laptops, tablets or smartphones. More specifically, an e-module is a form of presenting self-study materials that are systematically arranged into certain learning units, which are presented in an electronic format, where every learning activity in it is connected with a link as a navigation that makes students more interactive with the program, equipped with video tutorials, animations and audio presentations to enrich the learning experience (Depdiknas. 2017). In addition, the e-module is also equipped with instructions for independent study, so that students can learn according to their abilities, can fulfill all the competencies that must be mastered by students and can increase student activity and develop their skills independently. From the explanation above, it is clear that the composing of e-modules requires teachers' ideas, creativity and innovation so that students are able to understand the material better and have fun.

The researcher chose e-module to be developed in this research because of its great benefits, including: it can increase knowledge, stimulate mindsets, behave and develop further, and improve students' practical skills. E-modules can also facilitate students in independent and conventional learning. The interactive e-module developed in this study includes several media including text, images, video, audio and practice questions. The material that will be discussed in this e-module is about tolerance and harmony between religious communities, one of the main topics in the PAI curriculum at universities. The interactive e-module in this study was created using the application of the book creator. Researchers chose the book creator application to make this interactive e-module because of its easy use, besides the page effects it produces are very interesting and readers feel like they are actually reading a book.

3. Method

This research uses research and development (R&D) methods, which is a process used to develop and validate the results of educational products (Borg and Gall, 2003). The researcher used the R&D developed by Borg and Gall with the following steps: first, the preliminary research included preparation, in-depth survey, needs analysis; second, product development planning includes data collection, identification of developed products; third, product validation and revision (expert reviews, product trials); fourth, product implementation includes planning,

preparation, implementation, observation and evaluation. Research in this R&D is carried out with literature studies and field studies. While the development is carried out by compiling e-module, validating e-module, and testing the effectiveness of e-module. The product developed in this research is a valid and tested PAI interactive e-module.

The data collection technique of this research used literature studies and questionnaires. As for the data analysis technique, for qualitative data it refers to the three steps of Miles & Huberman, while for testing the research hypothesis if the data distribution is normally distributed, an independent sample t test or t test (quasi experimental design) is carried out. But if one or both groups of data are not normally distributed, then a Non-Parametric Statistical Test is carried out, namely the Mann Whitney test (Sundayana, 2014). The purpose of this test is to obtain empirical facts about the effectiveness of using interactive learning e-modules in improving student learning outcomes in PAI courses. All quantitative data in this study were processed using the SPSS version 18 facility.

4. Results and Discussion

4.1 PAI Interactive E-Module

The PAI interactive e-module in this study was created using the application of book creator. Researchers chose this book creator application because of its easy use, besides the page effect it produces is very interesting and readers feel like they are actually reading a book. This PAI interactive e-module is equipped with text, images, audio and audio visual/video. In addition, this PAI interactive e-module is also equipped with quizzes at the end of each material discussion so that students can measure the extent of their mastery of the material contained in this PAI interactive e-module. At the end of the e-module, a quiz is added again to test students' understanding of the entire material in this PAI interactive e-module. This PAI interactive e-module can be accessed at the following link: http://bit.ly/kerukunanberagama.

Below are some pictures of PAI interactive e-modules.

Figure 1. PAI interactive E-module cover

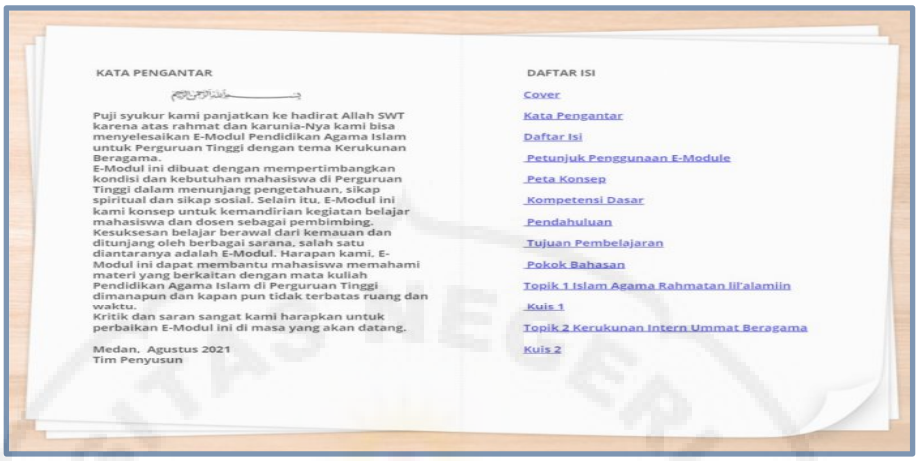

Figure 2. PAI interactive e-module

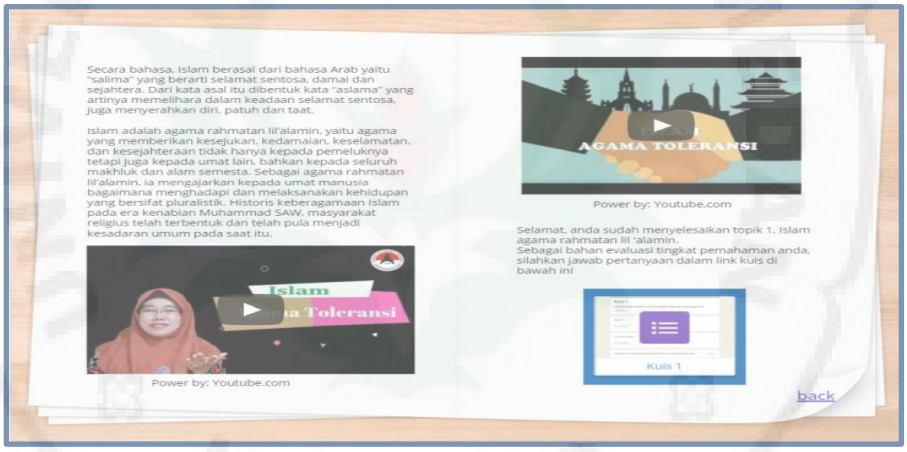

Figure 3. PAI interactive e-module

4.2 Validation of Material Expert and Media Expert

After the compiling of the PAI interactive e-module has been completed, further validation of the e-module is carried out by PAI material experts and media experts. The validation of the PAI material in this PAI interactive e-module was carried out by one of PAI material expert, Mrs. Nurhamidah Siregar, S.Ag, M.Kom.I. This material expert validation is important to ensure the accuracy of the material contained in this PAI interactive e-module, as well as to obtain various inputs for improving and increasing the quality of the content of this PAI interactive e-module material. The results of the validation of the material components in this PAI interactive e-module can be seen in Figure 1 below:

Figure 4. Material Expert Validation Results

Based on the data from the validation of the material experts above, it can be seen that the feasibility of content, presentation, language, and selection of images/videos/audio in this PAI interactive e-module is in the "valid" category with a percentage of 86%.

The validation of media and interactive e-module design was carried out by Mr. Drs. Luthfi Maulana Nst, M.Pd. Validation was carried out related to size design, cover design, fonts, e-module content design, navigation and interactive links. The results of the validation on the quality of the media and the design of the PAI interactive e-module can be seen in Figure 2 below:

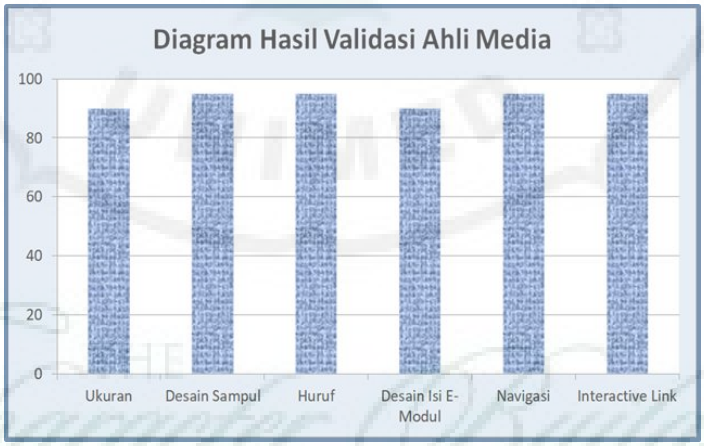

Figure 2. Media Expert Validation Results

Based on the data from the media and design expert validation results above, it can be seen that the PAI interactive e-module design is in the "very valid" category with a percentage of 93%.

4.3 The Effectiveness Test of the PAI Interactive E-Module

The effectiveness test of the e-module was carried out to determine the level of effectiveness of this interactive e-module in improving student learning outcomes and understanding of the PAI material contained in this PAI interactive e-module,

namely about Religious Harmony. The population of effectiveness test of the PAI interactive e-module was students of the Medan State University who take PAI courses as MKWU in the odd semester of the academic year 2021/2022. The research sample of this effectiveness test is divided into two groups, namely the experimental class and the control class. For the experimental class the researcher took five classes from different majors, namely students from the PGSD Department, the Pancasila and Citizenship Education Department (PPKn), the Indonesian Language Education Department, the English Literature Department and the Geography Department. While for the control class, the researcher also took five classes, namely students from the PGSD major, the Department of History Education, the Department of Indonesian Language Education, the Department of English Education and the Department of Anthropology. Details of the number of subjects in the PAI interactive e-module effectiveness test, both experimental class and control class, can be seen in the table below.

Tabel 1. Research Sample of the Interactive E-module Effectiveness Test

No	**Kelas Eksperimen**		**Kelas Kontrol**	
	Jurusan	**Jumlah**	**Jurusan**	**Jumlah**
1	PGSD	93 orang	PGSD D, E dan F	62
2	Pend. Bahasa Indonesia	37 orang	Pend. Bahasa Indonesia	32
3	PPKn	38 orang	Pend. Sejarah	31
4	Geografi	34 orang	Pend. Antropologi	27
5	Sastra Inggris	27 orang	Pend. Bahasa Inggris	32
	Total Jumlah Sampel	229 orang	Total Jumlah Sampel	184

In this effectiveness test, the steps taken are first to test the normality of the data distribution. If both groups are normally distributed, then the t test (Independent Sample t Test) is used; but if one or both groups of data are not normally distributed, then the Non-Parametric Statistical Test is used, in this case the Mann Whitney test.

The results of the normality test can be seen in the table below:

One-Sample Kolmogorov-Smirnov Test

		Kelas Eksperimen	Kelas Kontrol
N		208	184
Normal Parameters[a,b]	Mean	444.23	434.65
	Std. Deviation	42.949	38.215
Most Extreme Differences	Absolute	.159	.178
	Positive	.097	.116
	Negative	-.159	-.178
Test Statistic		.159	.178
Asymp. Sig. (2-tailed)		.000[c]	.000[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

From the table above, it can be seen that the results of the normality test of the experimental class value have a sig value of 0.000 and it is smaller than 0.05, so it can be concluded that the experimental class value is not normally distributed. While for the results of the normality test, the control class value has a sig value of 0.000 and it is smaller than 0.05, so it can be concluded that the control class value is also not normally distributed. Because the two classes are not normally distributed, it is continued with the Non-Parametric Statistics Test, in this case the Mann Whitney test. Before conducting the Mann Whitney test, the hypothesis of this study was formulated as follows:

Ho: There is no significant difference in the improvement of learning outcomes between experimental class students and control class students.

Ha: There is a significant difference in the improvement of learning outcomes between experimental class students and control class students.

The results of the Mann Whitney test can be seen in the table below:

Ranks

	Kelas	N	Mean Rank	Sum of Ranks
Hasil Belajar PAI	Kelas Eksperimen	208	210.88	43864.00
	Kelas Kontrol	184	180.24	33164.00
	Total	392		

Test Statistics[a]

	Hasil Belajar PAI
Mann-Whitney U	16144.000
Wilcoxon W	33164.000
Z	-2.726
Asymp. Sig. (2-tailed)	.006

a. Grouping Variable: Kelas

From the output above, it is known that the value of Asymp.Sig. of 0.006, because the value of Asymp. Sig. 0.006 < 0.05, then according to the basis of decision making in the Mann Whitney Test, it can be concluded that Ho is rejected. Rejection of Ho implies that Ha is accepted which means there is a significant difference in learning outcomes between experimental class students and control class students.

5. Conclusion

The conclusions of this research are as follows:

a. The development of teaching materials that are more diverse and accommodate advances in information technology needs to be carried out in PAI courses so that PAI learning becomes meaningful and fun for students and PAI learning objectives can be achieved more optimally. The development of the PAI interactive e-module in this study is very appropriate, especially during the distance learning period (PJJ) during the current covid 19 period.

b. The PAI interactive e-module developed in this study has been validated by experts and meets the criteria as a good and appropriate learning medium to be used in learning PAI courses at the State University of Medan where in terms of material it scores 86% (valid category), and in terms of media and design scored 93% (very valid category).

c. The use of PAI interactive e-modules at the State University of Medan has proven to have a significant impact on student learning outcomes. This can be seen from the results of the measurements carried out in this study, the results were Ho rejected and Ha accepted, meaning that there was a significant difference in learning outcomes between experimental class students and control class students, where the learning outcomes of students who studied using the PAI interactive e-module were higher than the learning outcomes of students who do not study using the PAI interactive e-module.

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