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Design and development of seamless learning to improving learning outcome of Islamic economic course: a case study in Indonesia

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Abstract

This research aims to develop a project-based seamless learning model that integrates formal and informal learning in the Islamic economic course, using the ADDIE model. The methods used in this study are divided into two stages. The first analyzes the expert test on the developed product model using the Content Validity Index (CVI) formula. Meanwhile, the second examines the learning outcomes data using the t-test. The expert validation showed the learning design developed is in accordance with the dimensions of Mobile Seamless Learning (MSL), and the developed Seamless learning model fulfills the requirements to be implemented in learning. Likewise, the results of the trial results showed Seamless Learning design developed can improve learning outcomes in the Islamic economic system course.

KEYWORDS: Seamless learning, Project Based Learning, Learning Outcomes, Islamic Economic System Course

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1. Introduction

The Islamic economic system is one of the education courses studied in State Universities (PTN) in Indonesia. It enables students to understand the basic concepts and source of the Islamic economic system and implement these characteristics in everyday life (Hanafi & Sulthoni, 2017). Therefore, implementing this course in universities curriculum is important due to its ability to affect the economic development of communities irrespective of the technological age (Basri, Samsul., Samin, Bunasor & Beik, 2019). It also helps to equip students with knowledge of the future economic system.

The learning process of the Islamic economic system is associated with the mastering the cognitive knowledge attitudes and personalities (Arifin, 2016). Students are encouraged to learn and memorize the teachings of religion in real life in order to reduce the "gap" between teachings and the realities.

The process of learning religion uses lectures and questions and answers method. so that learning activities seem monotonous (Choiri & Fitriani, 2011). Therefore, students loose interest in learning the religious education courses. Based on the research, 97% of students have difficulties in the learning religious education courses in classrooms, especially with Islamic Economic System topic (Awaluddin, 2014). Therefore, the problem is associated with knowledge, affection and practice.

The integrated topic in religious education courses is mostly related to contextual issues (Choiri, Moch. M.,

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& Fitriani, 2011). Therefore, the learning process needs to have direct contact in the context of intellectual development and real-life experiences. One of the techniques used to integrate formal and informal learning is a seamless learning model.

Seamless learning is defined as a continuous learning experience across various contexts (Chan & Chan, 2006). It aims to strengthen students' knowledge by expanding their space from home and school to their everyday life (Song, 2018). Cross-context learning enables a continuous learning experience in a variety of different environment, such as school or home (Milrad, Marcelo; Wong, Lung-Hsiang; Sharples, Mike; Hwang, Gwo-Jen; Looi, Chee-Kit and Ogata, 2013), while seamless is distributed across different environment (Toh et al., 2013). Seamless learning is a seamless connectivity, where the learning process takes place anywhere and anytime (Safiah et al., 2020).

Seamless learning refers to the seamless integration of learning experiences in various dimensions including formal and informal learning contexts, individual and social learning, and the physical and virtual worlds (Toh et al., 2013; L. H. Wong & Looi, 2011) distributed across different learning processes and across different spaces (in or out of class). Combining two learning models by integrating the two by maximizing the advantages of each environment. This serves to improve the learning tasks accessed by students through formal and digital learning spaces (L. Wong, 2015). Therefore, learning that utilizes seamless learning can help students complete projects and learning experiences in an informal environment have an impact on overall student learning success (L.-H. Wong, 2013). Thus, formal and informal learning complement each other in achieving learning objectives.

This is also known as unlimited learning, which connects formal and informal studies (Chan & Chan, 2006; L. H. Wong & Looi, 2011). It also emphasizes the need to design activities inside and outside the classroom. In addition, it encourages students to implement the knowledge learned in school to everyday life. The seamless learning model is continuously carried out both in terms of time, place, and context. To realize the learning process it is necessary to design seamless learning in accordance with the course of the Islamic economic system.

Instructional design is the science and art of creating detailed specifications for the development, evaluation, and maintenance of tools to facilitate students learning and performance (Richey, 2010). It is a theory that serves as a guide in the learning process and in knowledge development (Pabrua Batoon et al., 2018). Instructional design focuses on the performance of each student, in accordance with the teaching strategies, and learning methods used (Baldwin et al., 2018).

The development of this seamless learning design uses the ADDIE model. The ADDIE model is used because it has systematic development steps, so that the learning design is of higher quality (Ridha et al., 2020). Learning design is needed to create a student-centred educational experience (Reigeluth et al., 2017). ADDIE is one of the most commonly used in the area of learning design (Sites & Green, 2008). Implementing the ADDIE model in teaching facilitates complex learning techniques (Branch et al., 2018). This systematic process is represented in instructional process, namely Analysis, Design, Development, Implementation, and Evaluation (Sites & Green, 2008).

The purpose of this research is to develop a project-based Seamless Learning model for Religious Education courses, in Islamic economic system. The problems in this research therefore are as follows:

- How effective is the Seamless Learning design?
- Is the seamless learning model able to improve the learning outcomes?

2. Materials and Methods

2.1 Research Design

This study uses the research and development method of the ADDIE model to produce a quality Seamless Learning model for students. It focuses on the process of developing, validating and implementing a Seamless Learning model.

2.2 Research Procedure

The research and development process is divided into four stages, namely: (1) a preliminary study consisting of literature review and field observation. This stage is related to a needs analysis regarding the use of the Islamic economic system learning model in higher education. (2) design development, including model development, learning program development, and teaching material development (3) validation and revision, including feasibility testing from an expert's point of view and making revisions according to expert advice. (4) the model trial stage, namely the implementation of the seamless learning model in learning the Islamic economic system.

2.3 Research Subject

The research subjects were all participants involved in each stage of the design model. In the introductory stage, it involved 5 learning design experts. Design experts provide input on aspects of model design, namely: theoretical basis, syntax, and quality. Research subjects at the model trial stage involved 1 lecturer and 75 students. Field trials aim to determine the effectiveness of the seamless learning model on the competence of the Islamic economic system.

2.4 Research Instruments

The research instrument consists of an assessment tool designed by experts and a test instrument for learning outcomes with a total of 20 statements. However, the test consists of 20 multiple choice and 5 essay questions.

2.5 Data Analysis Technique

The data analysis techniques are divided into three stages. The first analyzes the expert test on the product model being developed using the Content Validity Index (CVI) formula (Hendryadi, 2017). This analysis calculates two types of CVI, namely the content validity of individual items (i-CVI) and content validity of the overall scale (s-CVI). The measurement uses a scale of 4 to avoid a neutral and ambivalent midpoint. The scales used are as follows: 1 = not relevant, 2 = slightly relevant, 3 = quite relevant, 4 = very relevant. Furthermore, for each item, I-CVI is counted by the number of experts that provided relevant assessments which are 3 or 4. Therefore, the dichotomization of the ordinal scale becomes relevant = 1 and irrelevant = 0, divided by the total number of experts.

Secondly, the data analysis technique of learning outcomes uses inferential statistics by comparing the seamless learning with the conventional models. Data were analyzed using t-test.

3. Results

3.1 Analysis Results

In accordance with the stages of the ADDIE, the student characteristics and learning material were first analyzed. The result showed that the students of Malang state university, as a sample of the research, have good learning independence, with facilities such as smartphones and good experiences outside the classroom.

Learning material for Islamic Economic Systems consists of theoretical and empirical instruments. It has a wide scope aimed at assisting students in understanding the concept of the Islamic economic system, its source, and implement into their daily life. This is a 2-credit unit course with a time frame of 100 minutes. Therefore, when compared to the vast scope of the material, the time spent is limited. Therefore, it needs to be supported by informal learning.

3.2 Final Design

After the analysis phase, the development is carried out based on the ADDIE model. Before developing the Seamless learning, a variety of theories are studied. Therefore, it produces a seamless learning model which is integrated with the project. The development phase of this model is described in the form of the following model design.

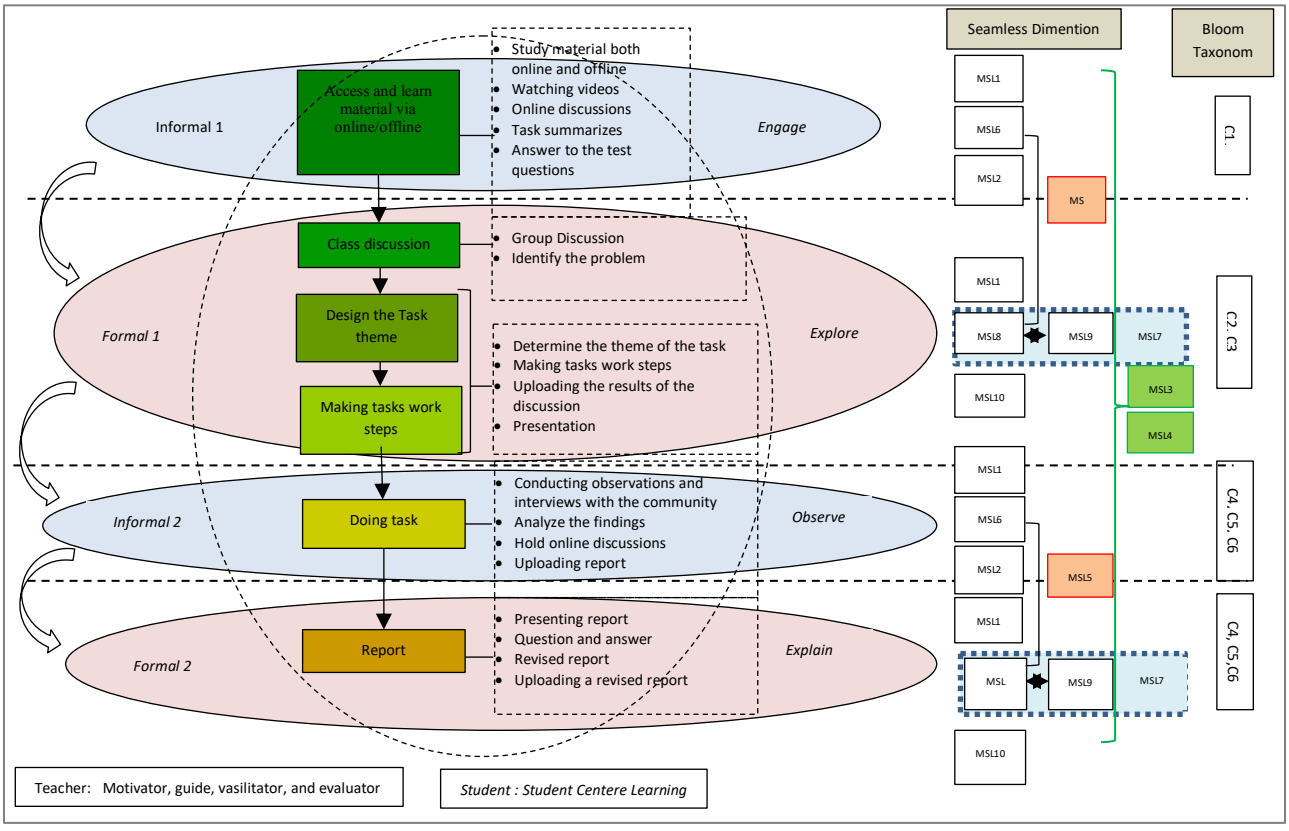

Figure 1 - Seamless Learning Design.

The Seamless Learning has four different implementation scenarios in each environment. In the first scenario, online learning in the informal environment, while the second, makes use of the face-to-face technique in accordance with the previous data obtained from the first scenario. The third scenario utilizes the process of independent learning through project assignments, and the fourth presents the final project.

The process of implementing seamless learning enables students to learn in a context that suits their needs. However, learning does not determine students estimated time, because each acquire knowledge differently. The steps of seamless learning in detail are shown in Table 1.

3.3 Results of Design Validation

The results of the design development are validated by the expert that provides assessments, comments and revision suggestions. These are relating to aspects of formal and informal learning (MSL1), Individual and social learning (MSL2), Cross-time (MSL3), Cross context (MSL4), Access to knowledge (MSL5), physical and digital world (MSL6), Using multiple devices (MSL7), Seamless transition between several learning tasks (MSL8), Knowledge synthesis (MSL9), and using multiple learning models (MSL10).

The I-CVI are obtained based on the data in Table 2, with the relevant calculation of each item shown in Table 1. Twenty items ranging from 0.80 to 1.00 are marked as relevant. Eighteen items have I-CVI = 1.00, and two items have ICVI = 0.80. Based on these results, it is concluded that 20 items are conside red relevant with a score above 0.78. Therefore, the learning design developed is in accordance with the dimensions of Mobile Seamless Learning (MSL).

3.4 Learning Outcomes

The results of the seamless learning implementation is shown in the following Table 3.

Based on the "Group Statistics" output table, it is known that the learning outcome for the control and experimental class group are 38 and 37 students, respectively. The mean value of student learning outcomes is 68,552, while for the experimental class is 77,905. Therefore, it is concluded that there are differences in the mean of student learning outcome.

Based on the "Independent Samples Test" the output table in the "Equal variances assumed" section, consists of a 2-tailed significance figure of 0,000 <0.05. Therefore, there are significant differences between the mean of student learning outcomes in the control and the experimental classes. Furthermore, from the output table, it is known that the "Mean Difference" value is -9.35277. This value shows the difference between the mean of student learning outcomes in the control and the experimental classes of -9.4233, with the difference ranging from -12,40124 to -6,3043.

4. Discussion and Conclusion

This research describes a project-based seamless learning design for Islamic economic system courses. It is carried out through five stages, namely analysis, design, development, implementation and evaluation. This was first validated by a design expert. The evaluation shows that the developed model is suitable for learning. Therefore, implementing the model provides better results on student understanding.

The results showed that seamless learning can improve learning outcomes. This is in accordance with the results of research conducted by Toh (2012) and Song (2014) which state that learning experiences using seamless learning can improve learning outcomes (Song, 2014; Toh et al., 2013). In addition, seamless learning is also effective in improving field observation performance (Hung et al., 2013). With seamless learning there is a continuity of learning experiences in various scenarios or contexts.

The seamless learning design aids to impact knowledge on the overall success of student (L.-H. Wong, 2013). In informal learning, it encourages the community to assist in training students' social interactive abilities. While in social interaction, students tend to build a deeper understanding of the concepts learned (Vai & Sosulski, 2014).

In designing informal learning, interviews were conducted on students and the community on the importance of using mobile/cellular technology (L.-H. Wong, 2013). Mobile phones are formed according to the needs of users and cross formal and informal boundaries (Impedovo, 2011). There are various advantages associated with the use of mobile devices such as portability, timeliness, independence and motivation to learn (Zakaria et al., 2019). There are two characteristics of cellular learning, namely: 1) Ability to take place in a mobile environment, and 2) ability to reconstruct students learning skills (L.-H. Wong, 2013).

However, the use of technology is inadequate to encourage learning without adopting appropriate pedagogy (Ertmer & Ottenbreit-Leftwich, 2013).

Sub-CPMK (Courses Learning Outcomes)	Study Materials (Learning Materials)	Form and Method of Learning	Student Learning Experience	Assessment	
				Criteria & Form	Indicator
(1)	(2)	(3)	(4)	(5)	(6)
1.1 Explain the concept of the economic system and work ethic in Islam 1.3 Analyzing contemporary issues of the Islamic perspective 2.1 Showing Islamic attitudes in responding to contemporary issues 3.1 Resolving scientific issues related to Islamic law	Economic System and Work Ethic in Islam - Islamic Economic System - Islamic Response to Modern Economic Transactions - Work Ethic and Life Independence	**Informal 1** − Study material on the Islamic economic system and work ethic both online and offline − Open and learn the material through the link in the LMS. − Watch learning videos − Students conduct discussion forums − Summarize your work − Students carry out exercises or tasks **Formal 1** **Session 1. Class discussion** − Students are divided into groups − Each group learns one sub-topic and presents it − Then proceed with question and answer. − Students identify problems that are relevant to the material in the community **Session 2. Determine the theme and task's work steps** − Students individually determine the theme of the tasks − They carry out tasks sequentially − Presentation of the discussion results **Informal 2** − Students make observations and interviews with the community on modern economic transactions that exist in the community − Students document activities in the field then upload it to the LMS application. − Students discuss online − Students make reports and analyze findings referring to the sources of Islamic law − Uploading report **Formal 2** − Report presentation − Question and answer − Revised report − upload the revised report in LMS	• Study **online** material using LMS and discuss it via discussion forums and do the exercises. • Task Report: Modern economic transactions from an Islamic perspective	**Criteria**: • Accuracy and mastery • Descriptive rubric for presentation **Non-test form:** • Report • Presentation	• Accuracy in explaining the economic system in Islam • Accuracy in describing the modern economic system in Islam; • Systematics and presentation style

Table 1 - Seamless Learning Design in Islamic Economic Systems Course.

Item	Expert					Total	I-CVI
	1	2	3	4	5		
Steps in classroom learning (formal)	1	1	1	1	1	5	5/5= 1.00
Steps outside the classroom learning (informal)	1	1	1	1	1	5	5/5= 1.00
Independent learning activities is clearly seen	1	1	1	1	1	5	5/5= 1.00
The collaboration between students is clearly visible	1	1	0	1	1	4	4/5= 0.80
It is clearly visible that learning activities are continuous and sustainable.	1	1	1	1	1	5	5/5= 1.00
Online learning resources re easily accessed	1	1	1	1	1	5	5/5= 1.00
Offline learning resources are easily accessed	1	1	1	1	1	5	5/5= 1.00
Online learning activities is visible	1	1	0	1	1	4	4/5= 0.80
Offline learning activities is visible	1	1	1	1	1	5	5/5= 1.00
The media used in learning is appropriate	1	1	1	1	1	5	5/5= 1.00
The media used are in accordance with the learning material	1	1	1	1	1	5	5/5= 1.00
The media used are easily accessed by students	1	1	1	1	1	5	5/5= 1.00
The flow in completing assignments in and outside the class is clear	1	1	1	1	1	5	5/5= 1.00
The flow of learning in completing assignments needs student analysis	1	1	1	1	1	5	5/5= 1.00
There is an involvement of the community in completing tasks	1	1	1	1	1	5	5/5= 1.00
The learning step supports increased knowledge	1	1	1	1	1	5	5/5= 1.00
The learning step supports the creation of experience both inside and outside the classroom	1	1	1	1	1	5	5/5= 1.00
The learning step supports the improvement of communication skills	1	1	1	1	1	5	5/5= 1.00
Use various strategies in learning activities	1	1	1	1	1	5	5/5= 1.00
The overall design flow is clear and systematic	1	1	1	1	1	5	5/5= 1.00
∑	20	20	18	20	20	Mean I-CVI	10.8
Relevant Proposition	1.00	1.00	0.90	1.00	1.00		

Table 2 - The Results of Expert Validation.

	Group	N	Mean	Std. Deviation	Std. Error Mean
Outcome	Control	38	68.5526	5.40994	.87761
	Experiment	37	77.9054	7.67195	1.26126

Table 3 - Group Statistics.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Outcome	Equal variances assumed	4.629	.035	-6.115	73	.000	-9.35277	1.52959	-12.40124	-6.30431
	Equal variances not assumed			-6.087	64.571	.000	-9.35277	1.53655	-12.42186	-6.28369

Table 4 - Independent Samples Test.

Therefore, the seamless model is integrated with project-based learning to facilitate higher levels of students' knowledge, increase their conceptual understanding (Salehudin et al., 2020; Wekesa & Ongunya, 2016) and participation (Gai Mali, 2016). The seamless learning design makes students autonomous learners that are able to decide when, where and how to study (L.-H. Wong, 2013). All activities are directed to determine and discover their learning experiences, therefore, they are able to develop intellectual abilities and master higher competencies.

Seamless learning is designed by integrating formal, informal and project learning techniques. According to the expert feasibility test, all indicators are considered appropriate and able to fulfil the learning requirement. The trial results showed that the seamless has higher learning outcomes than conventional model. It has the ability to improve the learning outcomes of the Islamic Economic System course.

Further research needs to be conducted to develop a different project-based seamless learning model with other platforms.

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