



Design of Ubiquitous Learning (U-Learning) on Thesis Writing Training and Final Project Assisted Massive Open Online Courses

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Abstract. This study aims to produce a ubiquitous learning (u-learning) training design for students who are compiling thesis and final project using massive open online courses (MOOC). The research method uses research and development of the ADDIE model. Data collection was obtained from expert assessments of the acceptability of product content that met accuracy, usability, convenience and attractiveness of the product. Data analysis is then carried out with Interrater agreement to get the value of the expert agreement. The results of data analysis show the conclusion that the content developed in the ubiquitous learning (u-learning) training design had very high acceptance with aspects of accuracy, usability, convenience and attractiveness so that it was feasible to use.

Keywords: Ubiquitous Learning · Thesis Writing · Massive Open Online Courses

1 Introduction

Completion of the thesis is part of the academic success of students to be able to graduate in the field they are engaged in. In the process of completing the thesis, students are often faced with problems from both internal and external factors. Internal factors that hinder the completion of the thesis include academic procrastination [1], low readiness of thesis writing skills [2] health and academic ability [3]. The external factors faced by students who are compiling their thesis include the many activities outside of academics such as work, and also peer interference [3], difficulty meeting supervisors [4], lack of motivation from family [5]. The obstacles that students have both from internal and external factors have an influence on stress levels [6] and academic anxiety for students [7].

Efforts to prevent problems with student thesis writing have been carried out such as self-regulated learning training [8], training on the meaning of alinsirah to reduce stress [9], training in writing scientific articles [10], SPSS training [11], and Mendeley training [12]. In particular, efforts to prevent thesis problems and develop a series of skills for successful thesis writing have been carried out, especially at the State University of Malang (UM) through the Center for Career Counseling and Academic Competence

Guidance Development (P2BK3A). The activities carried out were training on successful thesis writing ranging from offline with limited participant capacity, to synchronous and asynchronous online assisted by LMS SIPEJAR with more participant capacity. However, this process certainly still has obstacles and opportunities to open up training needs for people outside the State University of Malang. In the publication of the successful implementation of the thesis writing training, students outside UM are interested in. Unfortunately so far, access to LMS Sipejar can only be used by UM academics.

Based on these needs, it is necessary to develop training in writing thesis and final assignments that can reach many parties with wider open access to reach people outside UM. One of the platforms owned by UM and has great potential to be developed is Massive Open Online Access (MOOC). The training design that is currently needed is a training design that can provide flexibility for participants and can have a big impact in meeting their needs. So that the formulation of ubiquitous learning (u-learning) design development in thesis writing training and case-based final project based on Massive Open Online Courses (MOOC) is the answer to the needs of today’s society. This means that the massively developed training design can be used as a thesis and final project training model that provides the need for successful thesis writing in a comprehensive manner both in academic studies and non-academic studies.

In general, the purpose of developing a training design is to ensure that students achieve success in writing thesis. The success of writing this thesis is an indicator of academic success and a developmental task that is completed at the university level. Of course, the academic success achieved in ertiary level will be an important stage to reach the next stage whether working, entrepreneurship or continuing studies.

So it is very important to develop a thesis writing training design to support the achievement of student academic success, the achievement of the target of educational institutions/institutions, and strengthening of human resources in Indonesia.

2 Methods

Research on ubiquitous learning (u-learning) design in case-based thesis writing training assisted by massive open online courses (MOOC) uses research and development design. The research and development model used is the ADDIE model. The ADDIE model consists of Analysis, Design, Development, Implementation, Evaluation [13].

The data from research and development are data from needs analysis and expert assessment data. The analysis of data needs is done by testing the average needs with a

		First expert judgement	
		Low relevance 1-2	High relevance 3-4
Second expert judgement	Low relevance (1-2)	A	C
	High relevance (3-4)	B	D

Fig. 1. Interrater agreement

priority scale. While the expert judgement data consists of assessment scores, comments and input. The analysis that used for expert judgement assessment and prospective product users uses the interrater agreement as follows. The analysis used for this expert test assessment is the Inter-rater Agreement Model. An explanation regarding the Inter-rater agreement model can be seen in Fig. 1.

$$\text{expert test index} = \frac{D}{A + B + C + D}$$

Based on the agreement model (Inter-rater Agreement Model) above, the researcher will determine the index of expert validation results using the following formula (Table 1):

Table 1. Interpretation of the Results of Quantitative Data Analysis of Expert Judgment

No	Expert Index Level	Interpretation
1	$0,80 < r_{xy} < 1,00$	Very High
2	$0,60 < r_{xy} < 0,80$	High
3	$0,40 < r_{xy} < 0,60$	Enough
4	$0,20 < r_{xy} < 0,40$	Low
5	$0,00 < r_{xy} < 0,20$	Very Low
6	$r_{xy} < 0,00$	Not Valid

3 Result and Discussion

The research and development stage of the ubiquitous learning (u-learning) design in the case method-based thesis writing and final assignment training assisted by Massive Open Online Courses (MOOC) consists of 5 stages of analysis, design, development, implementation, evaluation. The achievements of the re-search and development stages are up to the design stage or preparation of product prototypes. The description of the implementation of research and development is described in detail as follows.

The analysis phase is carried out to identify student needs in obtaining training services in writing thesis and final assignments. Needs are obtained from the results of the implementation of training carried out by P2BK3A. Based on the 2021 P2BK3A activity report, that training on successful writing of theses and final assignments is of interest to members of the public outside the UM. So that the need for developing an LMS that can be accessed by members of the public outside the MU is using the MOOC platform.

Table 2. Expert Judgement Agreement

Product	Aspects of Faithfulness	Ahli 1	Ahli 2	Agreement
Handout	Accuracy	0,88	0,80	D
	Utility	0,84	0,80	D
	Convenience	1,00	1,00	D
	Attractiveness	1,00	1,00	D
Slide Powerpoint	Accuracy	0,80	1,00	D
	Utility	1,00	1,00	D
	Convenience	1,00	1,00	D
	Attractiveness	1,00	0,80	D
Video	Accuracy	0,90	1,00	D
	Utility	0,80	1,00	D
	Convenience	1,00	1,00	D
	Attractiveness	0,80	0,80	D
Motiongrafis	Accuracy	0,90	1,00	D
	Utility	0,80	1,00	D
	Convenience	0,80	1,00	D
	Attractiveness	0,80	0,80	D
Infografis	Accuracy	0,80	1,00	D
	Utility	0,80	1,00	D
	Convenience	0,80	1,00	D
	Attractiveness	0,80	1,00	D
Audio	Accuracy	1,00	1,00	D
	Utility	1,00	1,00	D
	Convenience	0,80	1,00	D
	Attractiveness	1,00	1,00	D
		0,89	0,96	D

The design stage is carried out by developing content in the ubiquitous learning design. The content consists of a training guide containing training program designs, handouts containing a description of teaching materials which contain at least 3 sheets for each meeting, 8 presentation slides, 4 explanatory videos, 2 motion graphics to explain the material, 4 infographics. 5 items to graphically explain information on training materials, 4 audio items to provide more detailed information. The details of the output of the content that has been produced can be seen in the attachment. This stage still needs to be continued, especially for motion graphics and video editing. Besides that, there are some contents that need to be reviewed again before being designed as a whole.

The content in the ubiquitous learning design is assessed by expert Dr. Indriyana Rachmawati, M.Pd and Nugraheni Warih, M.Pd. The results of the product acceptance assessment developed are as follows (Table 2).

The results of the analysis of the level of relevance of expert opinion 1 and expert opinion 2 show opportunities in the high relevance category which are listed in the table as follows.

		Expert Judgement 1	
		Low Relevance (1–2)	High Relevance (3–4)
Expert Judgement 2	Low Relevance (1–2)	0	0
	High Relevance (3–4)	0	28

The content that supports the implementation of the ubiquitous learning training design as a whole fulfills the acceptability of the elements of accuracy, usability, convenience, attractiveness. The suggestions for qualitative improvement from experts are described as shown in Tables 3 and 4.

The results of content analysis developed in the u-learning training design show agreement D. this means that the set of content developed from handouts, power point slides, motion graphics, infographics, audio, and infographics has high acceptability. Criterion D shows that the two experts have the same agreement with high relevance. Specifically, the discussion of the results of content acceptability is as follows.

The handout contains material descriptions for each training topic to support the gathering of information for participants. The results of the calculation of the expert judgment index on the handout assessment show a score of 1. The score of 1 obtained means that it has a very high level of acceptance. Handouts in online training are an important part of being able to help trainees gain a comprehensive understanding of the material. This is important to support the implementation of online training [14]. In ubiquitous learning training designs, handouts provide an element of ease of learning independently anywhere and anytime [15]. As one of the elements of acceptability from experts, namely convenience. This means that the handout developed meets accessibility to be accepted by all participants in the ubiquitous learning training design [16].

Power point slides were developed to facilitate training participants to be able to understand the material more easily with a concise display and display important points. This means that the power point slides produced in training content with a ubiquitous learning design for students who are preparing their thesis meet the very high category of acceptability from experts. Power point slides are very important content in the learning process in the current era of society [17]. Power point makes it easy for participants to understand the material quickly. This means that this fulfills the character of ubiquitous learning, namely immediately [16]. So that in the process of obtaining information on fun presentation slides it will be received positively by participants so they can interpret the material more optimally [18].

Video, an explainer video was developed to be able to provide a detailed explanation of the material being discussed. The calculation of the expert judgment index video explainer from expert. This means that the explainer video developed meets the elements of acceptability from the expert in a very high category. Explainer videos provide clear

Table 3. Expert 1

Feedback/Suggestions for improvement	Improvement
<p>a. The grammar was checked again, such as excess spaces were also found, excess letters, and the use of capital letters for city or region names.</p> <p>b. Adding worksheets added handouts.</p>	<p>a. Improve the writing grammar in handouts such as spacing, excess letters, sentence coheren.</p> <p>b. Add worksheets in handouts.</p>
<p>a. In making a power point in the first part after the title, it is better to add an outline of the material to be discussed.</p> <p>b. Add pictures or create power points to make it interesting to read.</p> <p>c. Even though there is audio, what if the power point is also given sound in the form of explanations or music.</p> <p>d. At the end of the power point, an activity sheet or activity evaluation should be given and a thank you note.</p>	<p>a. Add an outline of the material to be discussed</p> <p>b. Add pictures to make it interesting.</p> <p>c. Added sound to pull.</p> <p>Add evaluation and acknowledgments.</p>
<p>a. There is a motion graphics section where slides move very quickly, so you don't have time to read, especially if the explanation is long.</p> <p>b. It would be nice to change the font model because it seems too sticky.</p>	<p>a. Slow down slide change.</p> <p>b. Changed font type</p>
<p>a. Please check the composition of the text and infographic images again so that there is no empty space.</p> <p>b. The language used should be familiar to readers</p>	<p>a. Add captions of infographic bullet points.</p> <p>b. Change the language that is easier for students to understand.</p>

Table 4. Expert 2

Feedback/Suggestions for improvement	Improvement
<p>a. Writing can be shorter to adjust to the speed of slide changes.</p> <p>b. Because not all students read fast or the slide speed is reduced, so messages can be read completely</p>	<p>a. Shorten writing.</p> <p>b. Slow down slide change</p>
<p>It needs to be supplemented with reinforcing illustrations in material that only contains writing, so that it is interesting and not boring</p>	<p>Add illustrations to presentation slides to add interest</p>

visual and audio explanations for participants. The explainer videos developed meet the elements of media intelligibility because they are able to provide information to students accurately [19]. In addition, videos can encourage training participants or students to be able to learn more about the material [20].

Motion graphics are a supporting medium in ubiquitous learning training for students who are preparing their thesis. This means that the developed motion graphics meet very high acceptance criteria. Motion graphics provide complex media elements in the form of attractive simulation video displays, fun text and audio slides. Motion graphics provide a new medium for participants to be able to receive complex information into information that is more easily received with a pleasant display [21]. Motion is also a medium that accommodates real phenomena that occur to participants [22]. So that when the trainees follow the description of the material through motion graphics, it is hoped that they will have engagement because of its suitability with the phenomena that occur to them.

Infographics are content developed to facilitate training participants in understanding the material presented in detail specifically for a particular subject. There is also an assessment of the judgment specifically calculated as follows. The results of the expert judgment index from expert assessments show that the developed infographics have an agreement score of 1. This means that the developed infographic content meets very high acceptability elements. Infographics are a visual way of presenting detailed research results, data, and information [23]. The developed infographics meet the elements of conveying more detailed data information so that training participants can receive information accurately.

Audio is content that is developed to facilitate trainees in understanding the thesis preparation training material. This means that the audio content developed meets very high acceptability elements. Audio provides flexibility for students to listen to material and information as optimally as possible [24]. So audio was developed as an alternative to learning conducted by participants.

Based on the analysis that has been carried out specifically on the content developed in the design of ubiquitous learning (u-learning) on thesis writing training and final project assisted massive open online courses (MOOC) it shows that the entire content meets product acceptability according to experts. In the ubiquitous learning design developed for students who are pre-paring this thesis, it will be a way for them to learn material and help solve problems with flexible training. The training provided is not limited by distance and time. This is very suitable for the needs of the trainees as the current generation Z.

Suggestions for improvement given by experts such as adding worksheets to each handout given worksheets are part of the training process which not only accommodates participants to understand the material but also assists participants in implementing the material they have followed. The worksheet is part of the training process, which is a process of cultivating a scientific attitude towards the situation it faces. In this case, students who are preparing their thesis are faced with internal and external problems. Internally they face situations of adjustment to academic assignments that must be completed independently. Externally, the support of parents, friends, socio-economic conditions, and organizations also influences students in completing their thesis.

4 Conclusion

The research results of the ubiquitous learning (u-learning) design in case method-based thesis writing training assisted by massive open online courses (MOOC) show that the developed model meets the acceptability requirements which include aspects of accuracy, convenience, usability and usefulness. Assessment of product acceptability was obtained from an analysis of the inter-rater agreement of 2 experts. Based on expert assessments and analysis of product acceptability, it was concluded that research on the design of ubiquitous learning (u-learning) in case method-based thesis writing training assisted by massive open online courses (MOOC) is very feasible to use. Based on the product acceptability assessment from experts, it is expected that the developed model can help students in completing their thesis and final assignments optimally.

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