What do Millennial Students Need in Studying Materials Layout and Compatibility on Chamilo Platform?

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Abstract-*This article is the chunk of the research regarding learning object innovation in Chamilo platform. One of the activities zz organizing preliminary test field to prospective users. The objective of this article is clarifying students' response in learning the materials through Chamilo in term of readability, the ease of use, and the usefulness to the students. The product development method on the research is design-based research. The research involved 28 students of 4th semester who had already enrolled face-to- face class as the respondents. The students were given the opportunity to study the pre-developed online materials in chamilo for one week. Later, they were expected to deliver feedback individually regarding readability, the ease of use, and the usefulness of the materials. The result of this research shown at least 2 findings, those are 1) layout is more comfortable when it is used in portrait than landscape; 2) 6 of 28 participants responded regarding the learning messages compatibility aspect when it is used in different devices: computer (or notebook) and mobile phone. The implication of this research to innovation diffusion theory (Moore & Benbasat, 1991; Rogers, 1995) and Technology Acceptance Model theory (Davis, Bagozzi, & Warshaw, 1989; Gefen, 2004).*

Keywords: Compatibility, e-Learning, Layout, Learning Materials, Millennials

I. INTRODUCTION

This article based on qualitative learning product research and development. The framework of this research is using rapid prototyping model. The model consists of certain product development phases, including assess need and analyze content, set objectives, construct prototype/design, utilize prototype/research, and install and maintain the system (Tripp & Bichelmeyer, 1990). After the product has finished, it is continued with utilizing the prototype in real learning setting on a limited scale. The objective of this research is to explain the students' response in using the e-learning materials on Chamilo platform regarding the layout and compatibility.

Why layout and compatibility of e-learning materials become important? Millennials are currently dominating a productive area. The study program manager strives the development of a conducive learning environment for this generation. They have a tradition to accept feedback of their assignments, conduct teamwork, and peer evaluation (Sickler, 2009). Besides that, one of millennials' character is their close relation to technology-computer for them is not technology. They are also full of hope, well-structured, objective-oriented, and teamwork-minded (Jonas- Dwyer & Pospisil, 2004). Thus, the development of a learning environment should consider the character of the users, in this case, millennials in the higher education context.

This article is part of the research and development of a learning environment through web-based learning in higher education. As millennials might not consider computer -as a mandatory requirement of web-based learning- as technology, unfortunately, not every developer could identify corresponding learning environment to them. This is most probably because of the generation gap between learning environment developer with the learners themselves.

The e-learning platform is software that integrates different management, communication, evaluation, monitoring, and more features. The objective of this platform is supporting learning

technology for teachers and students to optimize various teaching-learning approach, from the smallest classroom or blended or mixing both modes in different proportion. Furthermore, the definition explains that e-learning platform is a complete software to support online-based teaching learning. From those definitions, it could be concluded that this platform is designed to assist, facilitate, and manage the online learning process. In this research, the device used to develop the products is a computer.

The e-learning platform is also known as LCMS (Learning Content Management System), a system that is mainly functioned to compile and organize learning materials in e-learning. LCMS as a system creates, saves, assembles, and personalizes e-learning content through learning object. Even tough LCMS manages and executes the learning process in an organization, LCMS concentrates on the learning content, the learning object. Thus, LCMS is a system that is used to manage learning content, such as combining the materials (learning object), chunking the content, or administering the learning.

Chamilo LCMS is an LCMS platform designed to support effective online learning. This is open-source software and has developed through a collaboration of companies, organizations, and individuals. Everyone could download and use chamilo. However, it is licensed under GNU/GPL. It is free for chamilo: to use, study, modify, and distribute chamilo. As a free platform, chamilo could be used in any project, education-based or professional.

The implementation of e-learning materials in the platform will build a conducive learning environment to the users, in this case, millennials students. The theory used to see the acceptance of technology in learning environment includes: Technology Acceptance Model (TAM) theory to build the electronic learning environment on mobile learning (Al-Emran, Mezhuyev, & Kamaludin, 2018), (Briz-Ponce, Pereira, Carvalho, Juanes-Méndez, & García-Peñalvo, 2017), (Hamidi & Chavoshi, 2018), (Esteban-Millat, Martínez-López, Pujol-Jover, Gázquez-Abad, & Alegret, 2018), (Wong, 2015), or online learning (Sivo, Ku, & Acharya, 2018); also innovation diffusion theory (IDT) (Al-Rahmi et al., 2019). Those researches use positivism approach that testing/proving the selected theory, meanwhile this article is based on research and development with a qualitative method where data categorization/criteria would be determined after the research is conducted.

II. METHODOLOGY

The context of this research is testing higher education subject that has been designed to be used in Chamilo platform through fip.web-bali.net. The development process is using rapid prototyping model. The model consists of certain phases: assess need and analyze content, set objectives, construct prototype/design, utilize prototype/research, and install and maintain the system. This research describes specifically on the utilize prototype before installing on the system to be used widely. The rapid prototyping model is considered beneficial as it allows researchers to constantly evaluate/review the development process whenever it is necessary. The review is intended to generate the learning product that fits the users' needs: constructing the conducive e-learning environment for millennial students.
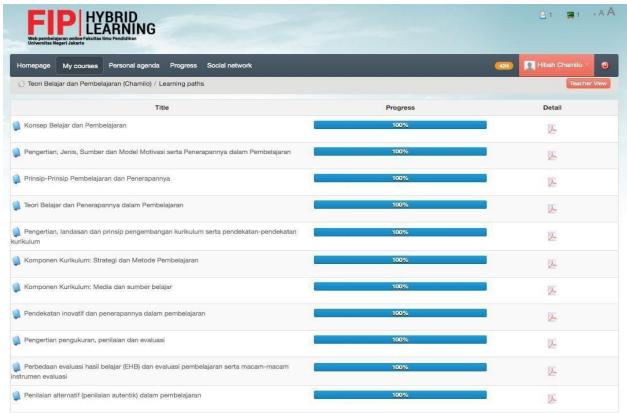
Image 1. Tested learning materials on chamilo

The research method used is a limited survey of 28 respondents who will assess 11 developed learning topics. The data collecting technique used is structured interviewed. Later, the data will be analyzed by categorizing them based on TAM. Meanwhile, the uncategorized data will be processed differently Below are the examples of the developed learning materials:

Image 2. Text-based learning material

Image 3. Image-based learning material

Image 4. Video-based learning material

Image 5. Infographic-based learning material

The research procedure starts with allowing students to study the materials per topic individually. Each student will be given two different topics and three studying hours. After that, they will be interviewed to gather their response regarding the materials. The responses covered within this article are only related to layout and compatibility of the materials on chamilo. Below are the questions used in the interview to collect the responses:

Table 1. Interview instrument

1	ont-size use on the materials readable?
2	the font-type used on the materials readable?
3	the cover presentation interesting?
4	the materials layout presentation interesting?
5	the layout of the text interesting?
6	re any assignment on learning materials that is intended to dig information regarding the studied topic?
7	there any summary?
8	e materials enhance your knowledge?
9	re any difficult part on the materials?
10	ou like with the presentation of the learning materials?
11	e materials understandable when you have to conduct independent learning?
12	the layout of the materials motivate you to study?
13	ou use a computer or laptop to access online learning?
14	you ever enrolled/logged in to online learning?
15	ou have any difficulties in accessing the online learning object?
16	ou capable to send the assignments through online?
17	ou capable to answer the test through online?

III. RESULT AND DISCUSSIONS

The data, as mentioned above, is collected through an interview with 28 students who are using chamilo platform in Teaching-Learning Theory subject. The responses of the 17 questions are described qualitatively.

Table 2. Responses to the questions in Table 1

Question	Responses
1	In general, the font-size has already readable. It does not too small not too big.
2	The font-type has already suitable and ideal to use for studying
3	Some students mentioned that it is interesting while some others mentioned on the contrary.
4	27 students responded that the presentation of the material has already interesting while 1 participant disagrees: "*In my opinion, it is quite interesting, yet it is difficult to be read by using the mobile phone*".
5	All participants agreed that the layout has already looked interesting
6	All students responded that there are assignments. One emphasized that each assignment was done on each topic's page.
7	Every respondent answered that there was always a summary available on each topic. It eased the reader to conclude the materials.
8	It is very useful to learn. One supported that the language was easy to understand which helped the learning process a lot.
9	50% of the participants answered that the materials are difficult to understand although it had already used communicative language. When formal language was used, it became more difficult to understand.
10	3 of 28 respondents expressed that they disliked web-based learning.
11	Majority of the students responded that it was possible to use it in independent learning, yet one disagreed.
12	There was the various answer to this question. Some expressed that it made learning more interesting and easier to understand, while others did not show their interest. Moreover, one student responded that they preferred using text-book to study

Table 3. Response to the Question

Question	Responses
3	100% of participants could access through mobile phone and computer. However, the computer was used less for its mobility.
4	All participants had experienced in online learning.
5	2 of 28 (7%) respondents expressed the accessibility of the online learning materials was easy and stable, while the rest (93%) disagree with the statement.
6	Some participants mentioned that it was easy to send the answer online, while others mentioned on the contrary. It was easy to answer the multiple choices questions through mobile phone. Meanwhile, responding to essay questions was difficult to conduct through mobile phone. They also faced difficulties in copy-pasting from other documents.
7	Majority of the respondents expressed that they could answer the questions easily, yet some were still criticizing the time limit given to finish the assignments.

In general, the learning material presented on chamilo received positive responses from the prospective users. The materials were presented in multiple forms, such as text, presentation, infographic, video, audio, and external links to other learning resources. On the technology acceptance model (Al-Rahmi et al., 2019), the perception of the ease of utilizing the product will affect the attitude toward e-learning implementation. This is also seen in the use of learning material presented on chamilo. Few students expressed that they feel more comfortable with the face-to-face classroom, while most of them considered this method was more accessible. This closely related to the acceptance of an innovation. Participants agreed that learning object eases the learning process, yet could not help shifting learning culture.

The main finding of this research is related to the layout and compatibility of the learning materials that were developed by based-on participants' learning culture. The research was conducted by testing the material through chamilo platform for one week. It was then found that the participant mostly accessed the website through their mobile phone that they use on a daily basis. Thus, most responses were related to the layout of the learning object that became uncomfortable to be read on their mobile phone. It was found that the materials did not fit their mobile phone screen. Some of the materials were cut out. Below are the quotes of the participants' responses:

"I can't fully open it on my mobile phone. In my opinion, it is also related to signal strength. Sometimes I can't move to the next materials on my mobile phone. The application itself has already well-designed and run well. However, it is necessary for students to develop their own motivation to study because we usually feel bored and lazy."

"In my opinion, the materials are really good and complete. However, the layout and icon placement are not interesting and well-placed. I suggest that the learning object could be well-accessed through mobile phone and the layout should be differentiated with the one designed for the computer so that it will be more readable for mobile users."

"I hope that the learning object (online learning) could be used more effectively by other students and could be better in the future. If possible, I suggest that we could do the

exercise through mobile phone. I also suggest that the learning object could be designed to fit the mobile phone in both portrait and landscape mode. Right now, we could only read on landscape mode."

"It is easy to use the learning object on the computer. However, when it comes to the mobile phone, sometimes it is difficult to click the link and it became less satisfying than using a computer. It is also probably related to the signal strength that obstructs in accessing the learning. Hopefully, this learning object could enhance our knowledge and would later be more accessible through mobile phone."

"The learning object on fip.web-bali.net helps me in learning as it supported with interesting materials, images, and video that motivates me to learn. It is also accessible everywhere, yet sometimes it is unreadable on a mobile phone because of the incomplete layout. Thus, it should be better opened in laptop/computer. I suggested this could be more accessible on a mobile phone in the future."

"In my opinion, the website of the learning object is interesting. Online learning model eases us to study independently. However, there are too many materials. Not only that, it is also difficult to read them in portrait mode. It is also difficult to zoom in and out. Hopefully, this website will be better developed in the future."

At least there are four participants commenting on the layout of learning material on this chamilo platform. This is closely related to their habit of using technology on a daily basis, as datareportal found that 91% of the Indonesian population use a mobile phone, while 60% are smartphone users.

The mobile phone is a device that is used on a daily basis. On the relationship with technology acceptance, based on diffusion and innovation theory, the new technology would be accepted and diffused widely and easily when it offers benefits which suitable with available practice and belief. It also has low complexity, responsible potential, and observation ability. Thus, in this research, participant understands that there is a useful innovation to increase their study performance. However, they still need compatibility to use this innovation to fit their daily habit: mobile phone access.

In this phase, researches did not aware of the compatibility of the learning object in the mobile phone. The development through a computer, in the developer side and the media expert side, both are using a computer. Later, it was found out that the layout presented differently in a different device. It is also relevant to the perception of the easiness in using learning object on chamilo platform.

Through the observation of the developed materials, it is shown that the materials that were developed in image format have low compatibility than presentation format (such as Powerpoint or Powtoons) when it is used in different devices. Thus, when it is observed from the technology acceptance model also diffusion and innovation theory, the implementation of the learning object on chamilo is more

important considering the users' perception building based on its compatibility even though they understand that this is important for their study performance.

This article answers the research question on how students respond in using the learning materials through chamilo based on readability, the ease of use, and the usefulness to the students. There are three main findings on this research: 1) learning materials by using chamilo is easy to learn and useful for their learning performance; 2) students access through media and learning resources are more likely using mobile devices (mobile phone); and 3) materials compatibility on chamilo is not flexible when it is used in different devices. The implications of the article are: 1) the usefulness of learning material does not impact the learning accessibility. This means, the implementation of technology that combines with diffusion and innovation theory could be further testing perception aspect on compatibility as the main consideration; 2) referring to the design-based research model, expert test should examine learning object in chamilo through different devices; and 3) diffusion and innovation theory (Dillon & Morris, 1996) on the trialability aspect, is less relevant to explain that innovation will always shift old perspective to the new one. In this research, the conducted innovation is accepted and approved to support study performance. However, participants disagree to change their learning culture. They agree that learning is more comfortable with a physical presence. Furthermore, millennials prefer their study materials have high compatibility in their daily learning habit.

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