



Virtual Museum : A Learning Material of Indonesia National History

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Abstract

The technology role of educational level nowadays rapidly grows, simultaneously it facilitates a learning process, especially in learning history. The students mind set is still on short term memory that affect the learning process are getting conservative and monotonous as well as do not have an experience. *Virtual museum* is one of the learning material forms referring to the indirect experience, based on Edgar Dale. The study applies qualitative research technique, the data uses in-depth interview to three group respondents consist of two History Education Department lectures of Sriwijaya University, 15 History Education Department students and three stakeholders. Based on the research findings, they are gotten by using *virtual museum*, the students are able to get the indirect experience on learning process focused in Indonesia National History. Therefore, it is expected able to become one of *virtual museum* development materials.

Keywords: Virtual museum; History learning; E-Learning

Introduction

Information and communication technology nowadays has been rapidly grown to the all life aspects (Mustakerov & Borissova, 2017) (Latah, 2017), especially on educational level either developed or developing country (Tanye, 2017). Technology role of educational era is used to facilitate learning process, on of the ways is *virtual reality* usage.

Virtual reality (VR) provides a three-dimensional graphical environment that can be accessed through the website. The virtual reality world is a three-dimensional world that allows users to manipulate and explore three-dimensional environments (Collins, Hammond, & Wellington, 1997). Furthermore, virtual reality is an attempt to make the experience as real as possible through the indirect experience (theory of Dale's cone) that allows learners to visit distant places, abroad that have become extinct or also called a virtual field trip.

A well-designed virtual field trip, involving maps, pictures and video clips in various formats can help students imagine the real experience on the site created (Jacobson, Militello, & Baveye, 2009). Virtual field trips can be designed for learning at historical sites, such as museums, temples, monuments, and more. Virtual field trips conducted in museums are commonly called virtual museums.

Virtual museum is one form of virtual reality, through virtual museum students in university particularly can get as much information as possible every museum object that is connected to google maps, related articles or journals, and related films the use of learning materials based on virtual library in college high will help students learn history better. At this stage, the role of learning technology seeks to design, develop and utilize a variety of learning resources so as to facilitate or maximize a person to learn anywhere, anytime and by anyone, with the ways and sources of learning what is appropriate with the conditions and needs (Warsita Bambang, 2013).

No exception to learning history, so far history subjects are regarded as boring and unattractive material, and history teachers use only conventional methods in the learning process. So one way to improve both interest and student achievement by using the latest methods are packaged in the form of technology. Visiting museums can expose students to materials that cannot be effectively discussed in the classroom, introduce students to resources within their community, and provide a variety of social experiences (Vavoula, Sharples, Rudman, Meek, & Lonsdale, 2009). Currently visits to distant places and difficult to reach can be done using virtual reality technology.

Indonesia National History is a mandatory lesson discussing the national movement era to era. Several can be became an object made a virtual by using *game engine* technology, namely *Unity3D*. The study investigates need analysis from *e-learning* usage of learning history process in University (Cakmak & Yilmaz, 2014), as well as does the informant responses of *virtual museum* application on learning process able to be references among further researchesto develop *virtual museum* technology especially on learning history material.

Related Works

Digital era most affects the development of media and learning material, deeply on *virtual museum* development which can be found around the world (Pan, Cheok, Yang, Zhu, & Shi, 2006) exactly with different contents and goals. *Virtual museum* has many content such as collection sources, either picture, photos, diagram, recording, newspaper article, etc. Furthermore, file saved digitally (Ann Nicholls, n.d.), then it can be accessed online (Schweibenz, 1998).

Virtual museum is also useful to participate in preserving the culture, but it is more innovative and also practical. We do not need to come to a museum far to see only a relic, but only by using a virtual museum then we can save costs both in terms of methods and tools, and certainly more exciting in terms of application (Styliani, Fotis, Kostas, & Petros, 2009). Furthermore, the users of this virtual museum will experience an indirect experience after, it is also expected to be the process of learning history.

This study refers to Dale's cone theory of experience as the foundation for real experience (Subramony, Deepak, P; Molenda, M; Betrus, Anthony, K; Thalheimer, 2014) in learning history by using e-learning media in the form of virtual museums. This cone depicts a visual analogy based on the degree of concordance and the abstractness of teaching methods and learning materials. The goal is to describe a series of experiences from the direct to the experience through the symbols of communication. The depiction is based on a range of experiences from the concrete to the abstract (Seels, Barbara B. and Richey, 1994). Therefore, it is important for researchers to continue innovate in developing media as well as learning materials based on e-learning in order to provide an indirect experience to students in the learning process (Dange, 2015). But until the 21st century still many teachers who still use still using

conventional and non-innovative learning media, there is still a lot of misinterpretation that the concept of Edgar Dale thought despite already using the learning media but has not been able to provide a real experience of the material taught (Matijević, 2012). Therefore the virtual museum offers an indirect experience that can be perceived by its users, thus making the construction of Dale's cone of experience more meaningful especially in learning History.

Methodology

The research uses qualitative method in investigating a phenomena based on Cone theory of Edgar Dale experience. One of the significant techniques in *grounded theory* research is constant comparison process which each data compared with others data one by one. The data is collected by interviewing, observing, taking note, or combining those ways (Ayu & Budiasih, 2014). Respondents consist of two History Education Department lectures, ten History Education Department students who have passed the theoretical class about Indonesia National History, and three stakeholders or service users. The chosen lectures are History Education Department lecture whom teach Indonesia national history in Sriwijaya University. The first step is a research conducts a preliminary observation by interviewing to the respondents, then they who consist of ten students asked to run the *virtual museum* application by using PC and also *Virtual Reality* 3D glasses. Furthermore, those conducted steps will be studied the responses and findings then drawn the conclusion based on the theoretical basis.

Results and Discussion

This stage conducts the in-depth interview to the respondents who have been chosen previously, they consist of lecture, student, and stake holder totally 15 respondents. The gotten data will be analyzed in terms of the discussed theme to answer of focus research questions. The first step is in-depth interview to investigate the perception or view of respondents about learning process on Indonesia National History material, the involved problems, and their responses regarded the use of *virtual museum* as learning source.

A. Respondent Opinion of the Process of Learning History

The main difficulty involved by students is the difficulty of remembering the material of Indonesia National History (SNI) in long term memory. Students only understand the material at lecturing time. After the lecture finished teach the material that has been studied, it is well forgotten. The student's habits who only learn by memorizing system and learning at the exam time be one cause of short-term memory. According to a student said that one of the factors that influence is the lack of direct experience in learning process, it means that it is limited only understanding and memorizing it.

... I argue, it is very natural that we cannot remember what material we have learned before it, because the created impression is very less or can be said the material and also how to deliver it are not interesting, so we do not much remember...

Based on the Three-Storage Model of Atkinson-Shiffrin Memory, much of the information exists only at the stage of sensory memory, such as sound and vision. The information is only kept for a while, but behind that there is some information we mainly notice, transferred to short-term memory (STM), which memory can be maintained for 30 seconds (or more with the help of repetition). Furthermore, Atkinson and Shiffrin suggest that as long as information is retained in short-term memory with the help

of repetition, the more likely it is to enter long-term memory (LTM). Information in long-term memory may also be recalled to short-term memory (Supardan, 2015).

The course of National History is expected able to assemble the Indonesia National History I to the Indonesia National History VI are interconnected with each other. Almost all respondents who were asked could not answer what material had just learned in the previous semester. Respondents who are currently studying SNI VII cannot answer the material of SNI VI. In fact, when a lecturer asked SNI material before it to the students, they had forgotten it. Though the course is only passed a few months. One of the student respondents stated that one of the obstacles in learning Indonesia national history,

... I think, one of the obstacles is the lack of data or sources that hinder the learning process, thus we cannot focus, on other side we have to find the source and understand the material in a short time....

The objective of the National History Course is students able to know and understand the history of Indonesia from pre-historic times to the present in order that students comprehend the identity of their nation. The response of the course lecturers, how obstacles or constraint of guiding SNI learning process,

....The handicap is too much material and also the students who do not read much and like the history material and this is naturally fair because this department is a History Education whom created history teacher not historian....

Indonesia National History lectures comprehends that students do not really like learning oriented in the discussion of contextual course. Students need historical evidence that can be found through direct experience to the field. In addition, one way to gain direct experience is to go directly to the historical object, based on interviews from other lecturer informants said that,

.... Field Work Program Activities (PKL) field trip is conducted a year with a different force and it becomes the department agenda. Field trips do during regular schedules and costs are borne by students themselves...

Therefore, to practice field lecturing, it will require enormous financials in order to gain hands-on experience to view and observe the historical objects learned. As Stakeholders deeply have high expectations of technological developments in the educational level (Shin, 2017), this is reasonable because they are the service users of the educators, of course they want a competent educator and able to adjust to the times. But in fact despite the rapid development of the Internet is still a lot of prospective teachers who have not been much use, so still using manual media. As stated by one of the respondents,

.... I think, teacher should have explored the material because it is from past event, so the teacher must be observant to see from various sources. Without capital of foresight it would not be possible. To improve affective, cognitive and psychomotor abilities then, ones have a lot to learn to ask other people who are more understanding and diligent access about the history itself from the Internet as well as visiting many places that can add science, especially the local

One of the learning that can be done with direct learning to the field. By learning through direct experience, the students get direct experience and very effective in the learning process (Zhao, 2012), but not all schools can apply this because it is limited to existing permits and programs.

The action that should be done to increase the ability of knowledge, skills and attitudes, there must be the existence of mutual sharing or asking each other in order to exchange opinions. In exploring the source of history should prospective teachers should be keen in finding sources and often access the internet history fan-page from reliable sources.

Based on interview results of respondents, it can be concluded that indeed the need for innovative learning media is needed, therefore researchers try applying the virtual museum with the material of Indonesia National History in order to provide an indirect experience on the students in accordance with the theory of Edgar Dale.

B. Museum Virtual Concept of Indonesia National History Material

Unity 3D is very popular in recent years. The efforts and the organisations that work on the development of virtual museums in Europe and all over the world are numerous (Skamantzari & Georgopoulos, 2016). Unity 3D as it is perfect for developing independent small-scale game apps and multiplatform game engine for the creation of interactive 3D content (Xie, 2012) (Jerald et al., 2014). Unity 3D has a good user interface and powerful interactive design module (Lu, Xue, & Chen, 2011).

Indonesia National History VI lesson in leaning by using virtual museums is expected to help students. History is not just facts, arguments and ideas, but also concerns the spirit, passion and sanction of the nation's personality. This sense of spirit and personality can be inherited in many ways as seen in cultural heritage objects, such as temples, statues, memorials, tombs of heroes, museums, or in the form of writing and performing arts.

Based on the interview results with students who will be the object of research. The result is students need an innovative learning material (Derboven, Geerts, & De Grooff, 2017). In addition, researchers have made visits to several related museums that made the virtual museum source.

The built virtual museum provides an overview of the various museums related to the Old Testament (*Orde Lama*) matter which is the scope of the Indonesia Historical History Course. Virtual museum contains photos, dioramas, sculptures, and writings. Inside the museum is also equipped with instructions, background sounds, music, and video history. Some of the museums taken are: *Bank Indonesia* Museum, Asian-African Conference Museum, National Monument, National Archives of the Archives of Indonesia (ANRI), and Museum of the Communist Party's betrayal (PKI).

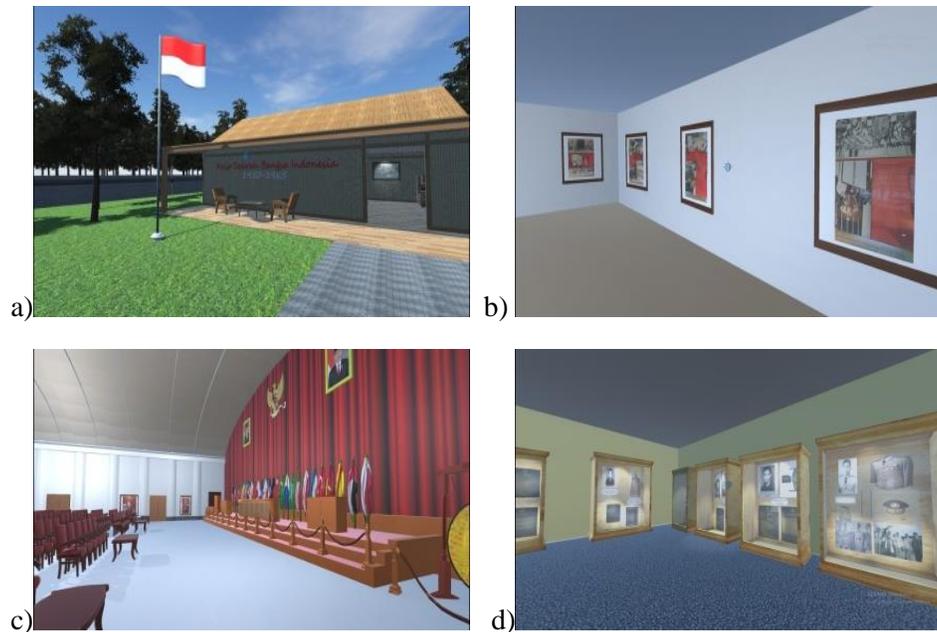


Fig. 1 (a) Simple front view of the house (b) Display of main exhibition space photographs of Asian-African Conference events documentation, (c) The interior of the Asian-African Conference room is held at Gedung Merdeka Bandung, (d) The exhibition room of the generals who are the victims September 30th Movement.

C. Virtual Museum Application of Learning History

States the virtual museum is a museum that is active in the virtual world. The development of the museum into a virtual form cannot be avoided due to the increasing digitalization of cultural heritage and the demand to make the collection more accessible. Learning History requires the role of museums to help students understand holistically and more attractively. The use of virtual reality concept in the field of museumology is called virtual museum. Through the virtual museum we can explore all the contents of the museum complete with guides and audio-visual technology. Therefore the real experience is by seeing or experiencing directly what will be learned. By using virtual reality media is expected able to realize it (Kersten, Tschirschwitz, & Deggim, 2017).

After conducting interviews with several respondents, the next stage of students who have been selected at random number of 10 people are invited to apply a virtual museum containing material about Indonesia National History, it is intended to bring students to gain experience indirectly and then conducted again the interview to know their response, as for the responses of some students are exactly different.

Speed within the use of virtual museums depends on the internet connection, this learning is constrained if the signal is not good. The use of virtual museum has its own charm, equipped with video, pictures and sounds. In addition, the use of time and cost in virtual museum learning is effective and efficient. This is proven by the students' opinion, with one learning material acquiring various material knowledge and able to replace the visit directly but it needs the cost to buy internet quota, applications. This application is used using special 3D goggles, below is the student response one student stated that:

....before I have never used this application. I feel really enjoy. Virtual museum makes learning less boring and I can immediately see the relics that exist in the museum without having to go there...

In fact, Sriwijaya University has an advanced computer room in the library that students can use to open virtual museum applications. The computer room is on to 20:00 p.m. This space has many computers and LAN cables. The internet network also has high speed. Students who follow the Indonesia National History Course VI can use computers in the library room that has a high specification.

When virtual museum applied in the field, virtual museum cannot be run online in website because it requires big and expensive hosting. Researchers use desktop applications by embedding applications offline on a used computer. Applications can also be used in android using, after this situation, one student stated that:

.... In my opinion, there is no faceddifficulty when the workmanship of the test just found little internet signal interference. Regarding the results of the test depends on the ability to master the material, the readiness and sincerity of each individual, if indeed every process of learning history deeply this kind we are very enthusiastic in learning and efficient and effective lessons mastered...



Fig. 2 (a) and (b) Students operate *Virtual museum* by using PC, and (c) and (d) Students use 3D Virtual goggles to access the *virtual museum*

The encountered constraint in learning by using a virtual museum that is not all computers can operate Unity3D applications, so it must be selected computer that supports the application. The computer room at Sriwijaya University Library is chosen as an online learning place because it has computer specifications that can be used by game engine applications. Another difficulty is the virtual machine game engine application produces noise due to step noise, background music sounds, sounds video, and the sound of songs produced by many computers. Students should use headsets to reduce noise.

Behind all these obstacles, the use of virtual museum applications allows students to understand a historical event through painting, video, and dioramas in a museum without having to visit the museum

physically. This will save both time and money (Barbieri, Bruno, & Muzzupappa, 2017) (Chau et al., 2013). Learning by using virtual museum applications is chosen based on a suitable learning strategy for the delivered material (Semradova & Hubackova, 2013). Learning strategy using this application can be used at the time face to face or online regardless of all the limitations.

The use of virtual museum is not only to facilitate the learning process in historical material, but it is also able to assist students in generating cultural awareness, historical reconstruction and awareness to participate in preserving the culture around us (Mortara et al., 2015). The concept of virtual museums that enter into virtual game categories makes it more fun to use, but some considered external factors are in developing this resource, first is to form a team of developers who are competent, both of the material and also the use of the application must be tailored to the ability both from age, physical condition, gender and profession, so as to be able to reach all levels of society (Laamarti, Eid, & El Saddik, 2014) then it can make virtual visits as effective learning (Songkram & Puthaseranee, 2015).

Conclusion

Learning uses *virtual museum* application is chosen based on the appropriate learning strategy to the delivered materials. It gives the indirect experiences to the users. This application can save time and financial needed to visit a museum or historical area. For the further researchers, the studies are expected able to reflection about the way of *virtual museum* application on learning history especially in university. Furthermore, several suggestions regarding the materials are the used computer to run *Unity3D* application must use the high specific computer (High RAM and VGA).

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