The Usage of Virtual Reality Technology Through Histopology Application to Increase Orang Asli Imagination Skill in History

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Abstract. Studies show that mobility problems in rural schools among students make the Teaching and Facilitation process less effective. Teachers need to incorporate the elements of Historical Thinking Skills (KPS) in tourism education embodied in the history syllabus of Year Six. However, this element cannot be implemented due to the constraints it has. Preliminary research has shown that Orang Asli students have severe problems with the process of imagination and empathy that they do not reach the minimum KPS level. Thus, one intervention was undertaken - the development of Histopology applications. It is an online application built on ASSURE and MICUP models integrating Google Earth and Google Street View based on Virtual Reality technology that creates 360-degree views for students to visualize tourist attractions in Malaysia. As a result, the minimum level of KPS was achieved, plus it also fostered the love for the country through the depiction of uniqueness of Malaysia’s tourist destinations.

Keywords: History, Historical Thinking Skills (KPS), imagination and empathy, Orang Asli students, Virtual Reality technology, tourist destination and patriotism.

1. Introduction

Kemahiran Pemikiran Sejarah (KPS) or Historical Thinking Skills is a form of cognitive process for students to explore complex and abstract ideas with the guidance of teachers based on the essential elements of history involving five categories: chronological skills, exploration of evidence, interpretation, imagination, and rationalization [1]. According to the Ministry of Education Malaysia, these skills are intended to practice thinking skills behind the events of history to nurture and strengthen the patriotism and sense of belonging to Malaysia [2-3].

Efforts to foster national identity are seen as severe to achieve among Orang Asli students. This is because education is a crucial channel for delivering this value [4]. However, it was stopped because of the percentage of attendance that they did not enjoy. In 2018, the average attendance of Orang Asli students for 98 schools in peninsular Malaysia is only 76.7%. This is due to the school education system is not suitable for their culture. The atmosphere of such schools is encouraging them to be lazy in school. [5] It has been proven that the learning environment and teaching methods in the school generate indigestion factors for Indigenous students. This phenomenon overrides the attitudes of parents, lazy students, and the unwillingness to associate as a factor in abstaining Orang Asli students.
Thus, the KPS of imagination cannot be applied, and the objective of teaching and learning cannot be fulfilled [4].

Thus, Virtual Reality (VR) technology is implemented by a combination of technologies that are used in order to visualize and provide interaction with a virtual environment [6]. These environments often depict three-dimensional visual which may be realistic or imaginary, macroscopic or microscopic and based on realistic tourist spots in Malaysia based on Google Street view. The multitude of scenarios that VR may be used to depict make it broadly applicable to the many areas in education, not just History. A key feature of VR is that it allows multi-sensory interaction with the space being visualized. The combination of multi-sensory visualization and interactivity make VR ideally suited for active learning. Chris Christou, 2010 [7].

2. Problem Statement
In year six Dokumen Standard Kurikulum dan Pentaksiran (DSKP) a standard of History’s curriculum and assessment by Malaysian Ministry of Education has stated the Learning Standard (LP) 10.2.2 List the capital and the royal city so that students can 10.2.5 unravel the uniqueness of the state's historical heritage in Malaysia. [8] Teachers, on the other hand, need to use KPS imagination and empathy to sync the patriotism value among students. However, the level of accessibility of Orang Asli’s students to school trips was low. It gives them less access to historical sites in Malaysia [9]. Therefore, teachers will have problems in the teaching and learning session to explain about that topic and also to use KPS in the session.

3. Project Objectives
The aim of the Histopology project is to develop an application based on Augmented Reality technology sync by Google Street View to get 360-degree visuals of historical tourist spots in Malaysia. It enables the KPS of imagination and empathy achieved by Orang Asli students. Thus the objective of teaching and learning is to achieve the application of patriotism values in students.

4. Project Design and Methodology
The methodology used to develop this software based on two models, combined.

4.1 ASSURE Model
The ASSURE model is an ISD (Instructional Systems Design) process that was modified to be used by teachers in the regular classroom. The ISD process is one in which teachers and trainers can use to design and develop the most appropriate learning environment for their students [10]. The ASSURE is an acronym for Analyze the learner, State objective, Select media and material, Utilize media and material, Require learner participation and also Evaluate and revise. The ASSURE model is a classroom-based teaching plan model. There are several essential steps in the ASSURE teaching design model and are best used in the teaching and learning process. Proper and well-organized lesson planning will produce effective teaching.

4.2 MICUP Model
The MICUP model is a technological development idea for teaching aids [11]. There are five phases in this model, including identifying problems (Mengenalpasti masalah), ideas (idea), inventions (cipta), product testing (uji), and branding (penjenamaan). The MICUP model is used to develop the application in the third phase of the ASSURE’s loop as shown in the diagram.
5. Result and Discussion

5.1 The user interface of the application
The Histopology apps can be download from the Google Play Store for free. Once students have downloaded the application, they will get the user interface as figure 2. The interface is a visual medium based which helps to facilitate the understanding of Orang Asli’s students who have poor English and Bahasa Melayu.

5.2 The search button
The search button allows students to explore any tourist spot in Malaysia contained in the textbook. These places also have their own charm so they can see more clearly the colors, structures, materials and other things that make them easier and quicker.

Figure 1. MICUP Model is fused in the ASSURE Model

Figure 2. The Interface of Histopology
5.3 The 360 view
The 360-degree panorama generated by Google Street View enhances the visualization of student tourism in Malaysia. By no means, imagination and empathy can be applied. Thus, the spirit of patriotism can be inculcated so that students can enjoy these exciting tourist attractions.

![Figure 3. The Search Button](image)

5.4 User Guide Slots (Help)
To create more user-friendly software, a help desk was created to further understand the user. In this room, students are informed of the objectives of learning, software usage guides, references, and links to related websites and information about developers.

![Figure 4. The 360-degree view](image)

6. Conclusion
Most of the AR applications created are developed by researchers or computer programmers [12]. Although there are efforts to enable this technology to be used by others besides those who have high skills in computer programming, currently there are no easy and suitable AR authoring tools available for teachers [13].

For students, this app is essential to provide them with a seamless experience as there is a mobility limitation for them to build their imagination of historical tourist destinations in Malaysia. This, in turn, enhances the element of pure patriotism and loves their homeland so that they can understand the importance of maintaining these places as an economic asset as well as a symbol of racial unity in Malaysia.

Reference
[1] Che Dahalan, and Shakila, “Kemahiran Pemikiran Sejarah Melalui Penggunaan Teknologi Maklumat Dan Komunikasi (TMK) Oleh Guru Pelatih., 2015.
[2] Kementerian Pendidikan Malaysia, “Huraian Sukatan Pelajaran Sejarah KBSM Tingkatan Satu, Dua, Dan Tiga”., 2010.
[3] Siti Hawa, and Aini, “Empati Sejarah Dalam Pengajaran Dan Pembelajaran Sejarah” *Jurnal Pendidik Dan Pendidikan*, 22 (5), 2007.
[4] Johan @ Eddy Luaran, “Perkembangan, Cabaran Dan Aplikasi Teknologi Maklumat Dalam Pengajaran Dan Pembelajaran,” *Konf. Pendidik. Univ. Teknol. MARA – Univ. Pendidik. Indones. Bandung*, 2011.
[5] Abdul Razaq Ahmad and Zalizan Mohd, “Masyarakat Orang Asli: Perspektif Pendidikan Dan Sosiobudaya”, 2009.
[6] UNESCO et al., “Educational Robotics as an Inovative Educational Technology,” *Procedia - Soc. Behav. Sci.*, vol. 2, no. 1, pp. 18–26, 2018.
[7] Christou, C., “Virtual Reality In Education. Education Book Chapter” https://www.igi-global.com/chapter/virtual-reality-education/40560., 2010.
[8] Kementerian Pendidikan Malaysia, “Dokumen Standard Kurikulam dan Pentaksiran”, 2017
[9] Mazdi Marzuki, Jabil Mapjabil, And Rosmiza Mohd Zainol, “Mengupas Keciciran Pelajar Orang Asli Malaysia: Suatu Tinjauan Ke Dalam Isu Aksesibiliti Sekolah”. *Geografia : Malaysian Journal Of Society And Space*, 10 (2). Pp. 189-198., 2014.
[10] S. E. Smaldino, D. L. Lownther, and J. D. Russell, “The ASSURE Model,” in *Instructional Technology and Media for Learning.*, 2012.
[11] Siti Rosni Mohamad Yusoff and Abd Samad Hanif., “Inovasi Digital Dalam Pengajaran Dan Pembelajaran” Oxord Fajar Sdn Bhd. Kuala Lumpur., 2019
[12] Shin, M., Kim, B.-s., & Park, J.A.R “Storyboard: An Augmented Reality Based InteractiveStoryboard Authoring Tool Paper” presented at the *Proceedings of the 4th IEEE/ACMInternational Symposium on Mixed and Augmented.*, 2005
[13] Martin-Gutierrez, J., Guinters, E., & Perez-Lopez., Improving Strategy of Self-Learning inEngineering: Laboratories with Augmented Reality. *Procedia - Social and BehavioralSciences*, 51 (0), 832-839. doi: http://dx.doi.org/10.1016/j.sbspro.2012.08.249 (2012)