Barriers for Digital Game-Based Learning Teaching Method: A Performance on Primary School Malay Historical Subject

Mudiana Mokhsin, Amer Shakir Zainol, Mohd Husni Mohd Som, Umaimah Kamarulzaman, Nur Athirah Ahmad Foad

Abstract: *History subjects are often connected with the traditional and teacher-centered learning which is not a very effective method. The learning and teaching technique of history subject is static, and students easily lost their interest to memorizing the facts. From the preliminary study towards the primary school history teacher, they stated that history subject was very challenging subject to be taught since it was difficult to attract the pupils to imagine and appreciate the Malay History era. The study aims to highlight how teaching by using Digital Game-Based Learning (DGBL) can be applied as one of the techniques to improve history subject teaching method. This aim was achieved by answering three research objectives, 1)identifying the current practice among the teacher in teaching Malay Historical Subject, 2)investigating the teachers' perceptions toward using DGBL and 3) determining the barriers that influence teachers towards using DGBL in teaching Malay Historical Subject. The study was conducted together with 35 primary school Malay historical subject teachers in Malaysia. Prototype evaluation was conducted using one to one testing with 14 participants. A part of the study requiredthe participants to rank 20 prospective barriers identified as obstacles to digital game-based learning.*

Keywords: **Malay historical subject, digital game-based learning, teachers' attitude, barriers, questionnaire, mobile application.**

I. INTRODUCTION

Digital games can be vital in enhancing skills for an individual to be more success in their lives (Rivadulla, De Jesus, Saludo, Balahadia, & Sandoval, 2017). Living and existing in modernization era, rather than playing games that were mostly played outdoor, has change to digital entertainment where there is no need for an individual to purposely go outside and play.

Mudiana Mokhsin, Faculty of Computer and Mathematical Sciences, UniversitiTeknologi MARA, Shah Alam, Selangor, Malaysia. Institute of Malay Thoughts and Leadership (IMPAK), Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

Amer Shakir Zainol, Faculty of Computer and Mathematical Sciences, UniversitiTeknologi MARA, Shah Alam, Selangor, Malaysia

Mohd Husni Mohd Som, Faculty of Art and Design, Science, UniversitiTeknologi MARA, Shah Alam, Selangor, Malaysia.Institute of Malay Thoughts and Leadership (IMPAK), UniversitiTeknologi MARA, Shah Alam, Selangor,Malaysia

Umaimah Kamarulzaman, Institute of Malay Thoughts and Leadership (IMPAK), UniversitiTeknologi MARA, Shah Alam, Selangor, Malaysia

Nur Athirah Ahmad Foad, Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia. Institute of Malay Thoughts and Leadership (IMPAK), UniversitiTeknologi MARA, Shah Alam, Selangor, Malaysia

According to a research on "Framework to Heritage Education using Emerging Technologies" (Mendoza, Baldiris, &Fabregat, 2015), by applying technology it can simplify the education process and closing the gap between the people and their historic knowledge.

According to research conducted by Universiti Malaya (Yaacob, Zainol, &Rus, 2014) Malaysian history subject method of learning and teaching frequently received criticism for its absence of relevance and creativity. History subjects were introduced and taught in primary schools since 2014 (Husin, Awang, & Ahmad, 2017). History subject dependably connected with an unexciting subject among the students, the teachers' latent mentality and absence of enthusiasm for upgrading their own teaching methodologies, skills and knowledge (Mohamad & Chong, 2011). A Digital Game-Based Learning (DGBL) can be identified as simply learning through games (Perera, Hewagamage, &Weerasinghe, 2017)&(ChePa, N., Bakar, N.A.A., Hussain, A., Hibadullah, C.F., 2019). The result of research and analysis done on Digital Game-Based Learning (DGBL) demonstrated that DGBL is a conceivable answer for many educational challenges (Putri, Moniaga, &Wijaya, 2016).History is a mandatory Kurikulum Standard Sekolah Rendah (KSSR) topic and for three years must be well trained for all normal four learners on an continuing basis (Hadi, Wan Daud, & Ibrahim, 2011). The primary school history curriculum or instructional program focuses on the growth of domestic culture and integrates aspects of citizenship and civic values to increase consciousness of national identity and patriotism among learners. (Barghi, Zakaria, Hamzah, & Hashim, 2017).Teaching history subject has been a difficult task for educators at the school. The problems are not only confronted by teachers, but also in the teachers' ideas that education is hard and tired because it is too filled with truths and complicated years that the learners need to remember (Lye & Sabri, 2013). It established a strict teaching and studying background environment and caused frustration among the learners (Ahmada et al., 2010).Digital Game-based learning (DGBL) is an instructional technique that includes teaching concepts and educational material in video games to link and engage learners (Tsai, Kuo, Chu, & Yen, 2015).Furthermore, teaching through digital games not only reduces the teaching strain encountered, but also produces a mental model that motivates the students to participate more in the teaching and learning process. Teachers viewed pleasure, concern, contest and collaboration as the four

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primary factors for applying DGBL in their learning strategy (Huizenga, ten Dam, Voogt, & Admiraal, 2017).In addition, there are study suggestions that the educational aspect of video games stimulates reading and promotes respondents to explore fresh subjects or expertise (Kekuluthotuwage & Fernando, 2017). In fact, digital games-based learning can also assist learners improve their software abilities that they may need in a culture that remains to evolve technologically.

II.RESEARCH METHODOLOGY

There are 4 phases involve in this study which are Research Planning, Construction of questionnaire and Data Collection, Analysis and Findings and Documentation as discussed below:

Research Planning

In this phase, the research has focused on understanding the current practice among teachers in teaching Malay Historical subject and challenges they faced in the classroom. The activities in this phase are preliminary study, LR and semi-structured interviews.

1. Preliminary Study

In order to identify the problem to be addressed, the Preliminary Study needs to be initiated by exploring the domain of the study. Several modules were defined in this phase of the study, i.e. research background, research questions, research objectives, and research scope. To achieve the deliverables to perform this study successfully, tools, methods, and techniques to conduct the research were identified. Preliminary study was conducted by exploring literature review about DGBL and history subject in primary school; which come from articles, books, journals, proceedings, and making observation to analyse the comparison between the existing Digital Game-Based Learning. The components were established to give a clear understanding towards this study.

2. Literature Review (LR)

Literature review has been executed to gain a deeper understanding of DGBL, history education in the Malaysian School Curriculum, teaching theories, challenges in current teaching method and others which addressed RQ1. This process had helped in understanding the research problem and allow us to address subsequent RQ2.The next step is to examine the literature acquired. A lot of journals, books, professional websites, proceedings, and online articles on DGBL and history education in the Malaysian School Curriculum have been reviewed to get an effective approach for the design of this study. All possible approaches from the reviewed materials were examined.

3. Semi Structured Interview

During this phase, semi structured interview was conducted with three history course teachers from SK Meru 2, Klang. These teachers have been chosen due to their main teaching subject which is the history-based course in the school. The workshop was conducted to concentrate on present learning methods and policies for conducting courses and also to define their demands or suggestions for creating a distinct learning atmosphere. This stage helps to understand the present issue that promotes why this research should be performed.

Construction of Survey Questionnaire and Data Collection

The purpose of this phase is to prepare relevant questions to investigate the factors that influence teachers towards using Digital Game Based-Learning in teaching Malay Historical Subject in primary school. The questionnaire was explored a few occasions before it was circulated to guarantee that helpful and precise information can be gathered for this research.

1. Survey Questionnaire Preparation

This research consists of a collection of questionnaires split into three classifications of participants'answers, including demographic profile and digital sports feelings, behaviors towards the use of digital games in primary education, and views of obstacles to the implementation of DGBL. The first portion of the questionnaire relies on context data about participants such as gender, age, year of learning knowledge, knowledge with digital games, and much more. The issues in the second chapter relate to behaviors towards the use of digital games in primary education.The chapter comprises of eight things and is split into two communities that are favorable and bad behaviour. The objects in the questionnaire are accepted from previous studies and other investigators' comments (Noraddin & Kian, 2014). The ultimate part of the study is linked to the views and worries of participants about obstacles to DGBL implementation. The study tool used is tailored from parts of the attitudinal report on DGBL implementation consisting of adjusted elements from previous studies (Wu,2015). This tool was selected to assess teacher views of obstacles to the use of digital games.

2. Collection of The Data

Two types of data collection that has been use in this study are primary and secondary data. Primary data has been gained from questionnaire that was dispersed to primary school Malay Historical subject teacher. The secondary data has been obtained from journals, books, professional websites, online articles on concepts and theories on the domain and related technology. The primary data gathering was conducted through two activities. The first and second part of the survey which contains eight questions on the demographic information and eight questions on the teachers' attitude toward DGBL was distributed to 50 history subject teachers by using online survey administered via Google Form. There are a total of 16 pieces focusing on investigating the present digital gaming history of educators and their behavior towards DGBL in their learning methods. However, before respondents answer the questionnaire, a short explanation about Digital Games-Based Learning was made to ensure the teachers understanding during self-administered approach. In addition, the questionnaire also created for two languages; English and Bahasa Malaysia. Therefore, respondents who are not good in English can answer the survey in Bahasa Malaysia. The third part of the

survey which contains 20 questions on the teachers' perceived barriers to the implement DGBL was conducted with 14 teachers by using one-to-one test session. During the session we asked the participants to use the prototype while continuously verbalizing their thoughts as they move through the user interface. Prior to the test session, the questionnaire on the teachers' perceived barriers in implement DGBL were handed out to all participants. The participants have been briefed about the benefits of the prototype and obtain their consent before involving them in the study. They are also been informed about the goals of the session. The participants also been explained on how to initiate interaction with the prototype.

Analysis and Finding

All quantitative data were kept in the Social Sciences Statistical Package (SPSS) and analyzed by means of descriptive statistics such as means, frequencies and standard deviation for the target respondents ' demographic factors. For more complex statistical techniques, reliability analysis has been testing to know the alpha values of each domain. Cronbach's Alpha has been applied to measures the reliability measurement and internal consistency on the multi item scales in each domain collected and resulted to correlate greatly with each other. Reliability indicates to the consistency, repeatability and stability of a data collection method. Ideally, the minimum Cronbach's Coefficient Alpha for primary research should be (0.7) and above (Pallant, 2013). The following rules of thumb for the reliability model are as in the Table 1 below.

Table.1 Rules of Thumb for the Reliability Model

Cronbach's Alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Documentation

The final phase of this project will be the documentation. The purpose of this phase is to document all the processes, works and findings throughout the research. Moreover, the contents and findings of this documentation can be helpful to assist other researchers for future work as their guidance.

III. ANALYSIS AND FINDINGS

There are three objectives need to be achieved in doing this research. All those objectives are the findings in doing the analysis for this research. The analysis and the findings to achieve the objective are as follows:

Research objective 1 is achieved by conducting phase of the research methodology employed for this study. The preliminary research, literature review and semi-structured surveys with historical subject educators in primary schools were performed in Phase 1. After the preliminary study was conducted, a more detailed literature review has been conducted of the issue being addressed and initiated contact with the teachers who teach Malay Historical subject in primary schools. The problem statement and research significance were continuously refined throughout Phase 1 study as more issues has being addressed in this study. A semi structured set of interview questions were applied with the teachers because it is more flexible for the respondents to answer. There are two sections on the interview questions. The first section of the question is concerned on the current teaching method, activities and strategies. The outcome from the study meeting indicates that two of the learning strategy of the participants were one-sided presentations with the lowest student involvement. Students are only going to behave as listeners. But one of the participants (professor) did a paper-based exercise in which he requested learners to compose colonialism factors and effects. The findings helped create a deeper understanding of the teacher's present exercise in learning Malay history in classrooms. The second section is related to the challenges that the teachers experienced in teaching Malay historical subject in schools. The teachers' feedback on the second section of interview is displayed in Table 2.

Table. 2 Teacher's Feedbacks on Current Teaching Practice

Respondents	Do you face any difficulties in teaching history-based course	Suggestion to improve
Teacher 1	• It's very hard to get learners to comprehend everything. • Students are less interested in lecture-based sessions	• I think that if some technological progress is made, it might be helpful. I haven't found any online games • I believe if some games or events are going to take place then learners will enjoy to join the school more than any other school

Teacher 2	• Very dry subject, there are too many dates and names that make it very confusing for students	• Modernization is to offer the pupils some technological methods. Therefore, they can offer the topic more interest.
Teacher 3	• Sometimes the historical theory is too long, so I can't educate them all.	• Students ' outdoor operations might be useful

The results of element 1 that asked about gender state that 62.9 percent of participants were woman and 37.1 percent were masculine. This result shows the frequently observed phenomenon in teacher education programs in Malaysia in the gender dispersion of the teaching force. The purpose of survey from item 8 to item 15 was to investigate the attitudes of educators towards the use of DGBL in primary education for the topic of Malay History. There are two components for the eight items. The first sections of items (item 8 to item 11) explore beneficial understanding of primary education use of DGBL. The second portion of the items (item 12 to item 15) evaluates the adverse opinion of the primary education use of DGBL in primary education. The justification for getting both adverse and good digital sports products is to verify that participants maintain accuracy of accounts. The first team concerned in validating the favorable perspective, specifically "Do history educators in Malaysia have favorable opinions in their learning methods on the use of digital games?" Items 8, 9, 10 and 11 were evaluated by means, standard deviation, frequencies and percentages to reply this query. The means and standard deviation ranged from 3.94 to 4.20 and from.677 to.838 respectively for the favorable stance of digital games.For the favorable behavior structure, the Cronbach's alpha was calculated to be.775, suggesting the validity is considered appropriate. In addition, the chart of percentages and frequencies shows that most educators agree on the favorable comments on digital games. The percentages of the contract vary from 48.6% to 51.4%. Teachers who highly agree with the favorable electronic entertainment claims vary from 28.6% to 34.3%. The percentages of educators who do not understand whether the favorable remarks appropriate to electronic games are within the spectrum from 14.3% to 22.9% of participants, while 2.9% to 5.7% of educators argue with the favorable claims about electronic games.Furthermore, the proportion of educators who highly object with any favorable digital sports declaration is 0 percent. The second portion of the issue attempted to determine whether main educators had adverse views of digital games. The issue was "Do Malaysian history educators have adverse opinions in their learning methods of using digital games?" The average, normal variation, incidence and proportion were calculated on element 5, 6, 7 element 8 to obtain outcomes for this issue. For DGBL's adverse approach, the ends and standard deviation varied from 2.20 to 2.80 and 1.05 to 1.40, respectively.For the adverse behavior principle, the Cronbach's alpha was calculated to be 0.823, suggesting the validity is considered great. In addition, the chart of percentages and frequencies shows that most educators argue with adverse claims on digital games. The disproportionate percentages are between 20% and 42.9%. Teachers who highly disagree with the adverse electronic

entertainment claims vary from 11.2% to 28.6%. The percentages of educators who do not understand whether the adverse remarks apply to electronic games vary from 14.3% to 37.1% of participants.Meanwhile, educators who comply with the adverse remarks vary from 2.9% to 11.42%. This study shows that most educators focused on historical subjects in Malaysia have favorable reactions to the benefits and utilizes of DGBL in learning in classrooms. Generally, the result suggests that teachers are willing to start integrating and utilizing DGBL in their teaching practices. Research goal 2 has been accomplished from this.

Research objective 3 has been achieved by using a prototype of Augmented Reality on Malay Figures Mobile Application (ARMYF) which has been used as a DGBL tool during the survey which contains 20 questions on the teachers' perceived barriers to the implementation of DGBL. Also, the session was conducted with 14 teachers by using one-to-one test session. The prototype is shown below in Figure 1.
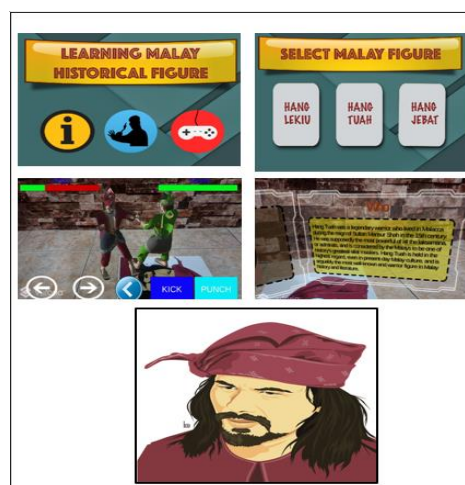

Fig. 1 Augmented Reality on Malay Figures Mobile Application (ARMYF) is a Malay Historical Figures mobile learning tool. The integrated components in this implementation are a template of 3D models with an image and a part of the combat match

A total of 20 sub-items were identified as potential external barriers that might hinder the integration of DGBL into the classroom by teachers. In 12 of the 20 sub-items, most study takers decided "approve" and "oppose" in 3 of the 18 sub-items. Sub-items such as "not enough moment to use DGBL in brief school intervals" (71.4 percent), "Lack of preparing to use DGBL in learning technique" (42.9 percent), and "Short lesson interval hinder long-term involvement in complicated DGBL" (42.9 percent) were the top-three

classification sub-items decided upon as the most prominent internal obstacles to the use of DGBL.This indicates that most of the 14 study takers were primarily worried about the moment made to implement Digital Game-based Learning. The second highest percentage of teachers agreed was "Lack of preparation to use DGBL in teaching method". Those findings may be a result of teacher's usual practice with technology as a part of their regular job. The third highest barriers choose by the teachers is "short class period hindering long-term engagement in complex DGBL". These findings might be resulted from the short length of time provided in history subject classes while there are lot syllabuses to be covered. To match into training, it could be hard for educators to pick a suitable game name and provide a full-length digital game into significant systems. Yet educators can purposely select and use DGBL short-lengths that are suitable for learning material or transitioning into other educational operations.

The two main obstacles that most educators struggled with are the "Technology is a distraction" and "Playing DGBL may have negative influences on students". The result may be due to most of the teachers in this study have personal gaming experience, so the concept of continuous feedback for strategy improvement may have occurred to them. The study concentrated on descriptive stats to this stage of debate.

IV.CONCLUSION AND RECOMMENDATION

It is recommended if this research, involves the existing DGBL on actual implementation for teachers who interested to apply DGBL. Apart from that, it is also beneficial to investigate other factors on why few teachers unwilling to implement DGBL in their teaching practice.

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