

## Engaging Game Design in Learning Historical Patriotic Heroes: Students' Perceptions

N. H. Mat Zain<sup>1\*</sup>, H. Zaini<sup>1</sup>, M. N. Zulhemay<sup>1</sup>, A. Baharum<sup>2</sup>, W. F. Bustamam<sup>1</sup>  
and F. H. Abdul Razak<sup>1</sup>

<sup>1</sup>Faculty of Computer and Mathematical Sciences (FSKM), Universiti Teknologi MARA (UiTM), Melaka, Kampus Jasin, 77300 Merlimau, Melaka, Malaysia

<sup>2</sup>Faculty of Computing and Informatics, Universiti Malaysia Sabah (UMS), 88400 Kota Kinabalu, Sabah, Malaysia

### ABSTRACT

Computer games are often considered a teaching and learning tool as it is generally appealing to students. In this preliminary study, we investigate students' perceptions of engaging game design in Learning of Historical Patriotic Heroes. In total, 33 students were involved in this study. The data was examined using standard descriptive statistical approaches. The results of the study indicated that the majority of the respondents are interested in the idea of Learning of Historical Patriotic Heroes through game approach. Hopefully, the outcome of this preliminary study will underline the need for developing a rigorous engaging game design for education.

*Keywords:* Engagement, game design, historical patriotic heroes, students' perceptions

### INTRODUCTION

Computer games as a medium for learning is not a new. Computer games promote active learning, critical thinking, knowledge creation, collaboration, and effective use of electronic forms of information (Boyle, Connolly, Hailey, & Boyle, 2012). From an educational perspective, games are engaging and adaptable to almost any subject. Enhancing engagement in learning activities is widely considered as an important goal to be reached (Watson, Mong, & Harris, 2011). The purpose of this preliminary study is to investigate students' perceptions of engaging game design in Learning about Historical Patriotic Heroes. The study sample consisted of students who

#### ARTICLE INFO

*Article history:*

Received: 29 September 2016

Accepted: 05 April 2017

*E-mail addresses:*

nurulmz@tmsk.uitm.edu.my (N. H. Mat Zain),  
hazrati\_zaini@salam.uitm.edu.my (H. Zaini),  
nabilz@melaka.uitm.edu.my (M. N. Zulhemay),  
aslinabaharum@gmail.com (A. Baharum),  
riduan@uthm.edu.my (W. F. Bustamam),  
fariza@tmsk.uitm.edu.my (F. H. Abdul Razak)

\*Corresponding Author

wanted to learn about patriotic heroes in Malaysia. We took students as a sample study because the previous research findings showed that playing computer games was a popular activity among students (Bourgonjon, Valcke, Soetaert, & Schellens, 2010; Ott & Tavella, 2009). The outcome of this study can be used as guideline for game designers throughout the design process.

## **Theoretical Background**

**Engaging Game Design.** Engagement has been proposed as an essential tool behind the success of educational games (Garris, Ahlers, & Driskell, 2002; Kiili, 2005). Moreover, engagement seems to provide a way to address the important issue of active learning (Admiraal, Huizenga, Akkerman, & Dam, 2011). In the literature, the term engagement is used in different ways. It is used in expressions such as learner engagement (Whitton, 2011), engaging by design (Dickey, 2005), and engagement level (Filsecker & Hickey, 2014). Some researchers examine how educational games can enhance individuals' engagement (Filsecker & Kerres, 2014). Others study the role of engagement on achievement (Fredricks, Blumenfeld, & Paris, 2004) and how classroom activities can produce high levels of engagement (Engle & Conant, 2002).

In this study, engagement is defined as the simultaneous elements of concentration, interest, and enjoyment encapsulating the experience of flow. All three elements are inherently related to learning (Shernoff, 2013). Concentration is central to flow and related to meaningful learning including depth of cognitive processing as well as academic performance (Corno & Mandinach, 1983). Interest leads to attention, reproduces intrinsic motivation, stimulates the desire to continue engagement in an activity, and is related to school achievement (Schiefele, Krapp, & Winteler, 1992). Engagement has been divided into three types of engagement: behavioural, cognitive, and emotional (Fredricks et al., 2004). The three dimensions of engagement were correlated in game-based learning environment (Pellas, 2014).

A study by Byun and Loh (2015) also found that voiceovers in a game can also contribute to positive effect on engagement in game-based learning environment. Moreover, Sabourin and Lester (2014) found that game-based learning was able to support learning and promote engagement. Admiraal, Huizenga, Akkerman, and Dam (2011) also found that flow had a positive effect on students' performance in the game but did not have an effect on learning outcomes; yet, if the students were engaged in a group competition, the more the students learned.

**Learning Historical Patriotic Heroes through Computer Games.** An increasing number of researchers are recognizing the impact of computer games and exploring the potential for gaming technology to engage learners (Zain, Jaafar, & Razak, 2012) such as in learning of historical patriotic heroes. In this study, we define a historical patriotic hero as a person who makes significant contributions to the development of civilization and is admired for any of a number of qualities, including courage and outstanding achievements. Besides, historical

patriotic heroes are individuals who are encountered when studying the history of Tanah Melayu (Malaysia). Some of the renowned national heroes Tun Perak, Tok Gajah, Mat Kilau, Hang Tuah, Dato' Maharaja Lela Pandak Lam, Haji Abdul Rahman Limbong, Tok Janggut, Yamtuan Antah, and Rentap.

The learning of historical patriotic heroes involves memorizing the events, characters, and dates occurred in the sequence. One of the approaches to learn historical context is by referring to history textbooks. However, many students have a hard time recalling historical information due to oral semantic memory storage limitation. Moreover, the abstract context of the period of the places of events is not present (Foreman, Korallo, Newson, & Sarantos, 2008). Hence, we proposed learning of historical patriotic heroes through engaging game design.

According to Radetich and Jakubowicz (2015), computer games can be used in teaching when learning and playing takes place at the same time. In addition, as stated by Thillainathan, Hoffmann, Hirdes, and Leimeister (2013), computer games are the medium that combines gameplay experience with educational context by conveying learning objectives into a game, thereby sustaining the player's enthusiasm. In other words, computer games can provide an effective learning medium in the fields of higher declarative knowledge, procedural knowledge, and higher retention (Fang, Tan, Subramaniam, & Loi, 2013).

## **MATERIALS AND METHODS**

### **The Participants**

The participants were required to indicate their agreement with the items related to perceptions of engaging game design in learning historical patriotic heroes. Participants were required to respond to 10 items, with each item having five options for the response on a scale from 1 = strongly disagree, 2 = disagree, 3 = moderately agree, 4 = agree, and 5 = strongly agree. It was expected that the survey would take approximately 5-10 minutes to complete. Confidentiality and anonymity was protected at all times, and participants were informed that the data would only be disclosed with their consent. The participants were also informed that the data obtained from the questionnaire would be assigned a subject number that would not be paired with other personal details.

### **Instrument and Procedure**

The instrument adapted from the literature review contained 10 items. The instrument concerns students' perception of engaging game design in Learning Historical Patriotic Heroes. Table 1 shows the list of items that were adapted from previous studies. On the day of the assessment, consent forms and detailed guidelines were given to the participants prior to distribution of the questionnaires. The researcher was present to clarify any enquiries, and participants were informed that the assessment would involve responding to questions related to perception of engaging game design in learning historical patriotic heroes.

Table 1  
*The items that were adapted from literature review*

No	Items	Ref.
1.	I am interested in learning historical context through computer games.	(Watson, Mong, & Harris, 2011)
2.	Learning historical context through computer games will enhance students' engagement.	(Watson et al., 2011)
3.	Learning process will enhance through engaging game design.	(Ke, 2014)
4.	I will enjoy learning historical context through engaging game design.	(Boyle, Connolly, Hailey, & Boyle, 2012)
5.	I will be excited to learn historical context through engaging game design.	(Garris, Ahlers, & Driskell, 2002)
6.	I will enjoy the engaging historical gameplay.	(Federoff, 2002)
7.	I feel informative with the engaging historical storyline.	(Sylaiou, Mania, Karoulis, & White, 2010)
8.	I feel easier to remember historical facts through engaging game design.	(Sampayo-Vargas, Cope, He, & Byrne, 2013)
9.	I understand historical context with the engaging game interaction.	(Ke, 2014)
10.	I prefer to learn historical context through computer games rather than traditional methods.	(Rondon, Sassi, & Furquim de Andrade, 2013)

## RESULTS AND DISCUSSION

The data was analysed using the SPSS software to estimate the frequency (%), standard descriptive statistical methods were used for the variables. In total, 33 students participated (9 male and 24 female) involved in this study and all of them were computer game users. The participants were distributed in the age groups of 13-19 and > 20 years. The findings of the descriptive analysis for each item are based on a Likert Scale. Figure 1 (a) shows the findings of the statement - *I am interested in learning historical context through computer games*. The findings show that most students agreed (N = 22, 66.67%) and strongly agreed (N = 5, 15.15%) to learn through computer games. Based on the results, the maximum score on the scale is agree, followed by strongly agree and moderately agree. Only one respondent (3.03%) disagreed and strongly disagreed with less than 10% disagreeing. Figure 1(b) presents the percentage results of item 2. One respondent strongly disagreed and another disagreed with statement of item 2. There are 10 respondents (30.30%) who moderately agreed and more than half of the respondents strongly agreed (N = 19, 57.58%) that learning historical context through computer games can enhance engagement among students for the subject.

As shown in Figure 2(a), more than half the respondents agreed that engaging game design will enhance learning process (N = 18, 54.5%). Only one respondent (3.03%) disagreed and one strongly disagreed with this statement. Figure 2(b) presents the results of item 4. The results revealed that most of respondents agreed (N = 11, 33.3%) that they enjoy learning historical

context through engaging game design. Meanwhile, eight respondents disagreed and eight strongly disagreed, which is less than 10% of disagreeing.

As shown in Figure 3(a), approximately half of the respondents (N = 13, 39.4%) agreed that they were enthusiastic to learn historical context through engaging game design. Based on the result, the answers of the respondents tended towards broadly agreeing. Figure 3(b) shows the results of the statement - *I feel fun with the engaging historical gameplay*. Half of the respondents agreed (N = 17, 51.52%) and strongly agreed (N = 4, 12.12%) that it will be fun when the game has an engaging gameplay. Results indicate the highest proportion fell in the category of agree, strongly agree and moderately agree, respectively. Only one respondent (3.0%) strongly disagreed with item 6.

Figure 4(a) presents the results of item 7. The results revealed that more than half of the respondents agreed (N = 21, 63.64%) that they felt informed with the historical storyline. Meanwhile, five respondents disagreed and strongly disagreed, which is less than 10% of disagreeing. Figure 4(b) presents the results of item 8. The results revealed that respondents agreed (N = 18, 54.55%) that they felt it was easier to remember historical facts through an engaging game design. Meanwhile, there are 24.24% (8 respondents) who moderately agree with this statement.

The participants responded to the questions on the understanding of historical context with the engaging game interaction. As shown in Figure 5(a), 11 respondents (33.33%) moderately agreed with the statement, followed by 16 respondents (48.48%) who were in full agreement. There were two respondents (6.06%) who disagreed and one respondent (3.03%) who strongly disagreed of, the almost 10% who disagreed. Figure 5 (b) presents the results of item 10. The results revealed that more than 50% of respondents expressed agreement in terms of preference to learn historical context through computer games rather than traditional methods. Meanwhile, there are 6.06% (2 respondents) who disagreed with this item.

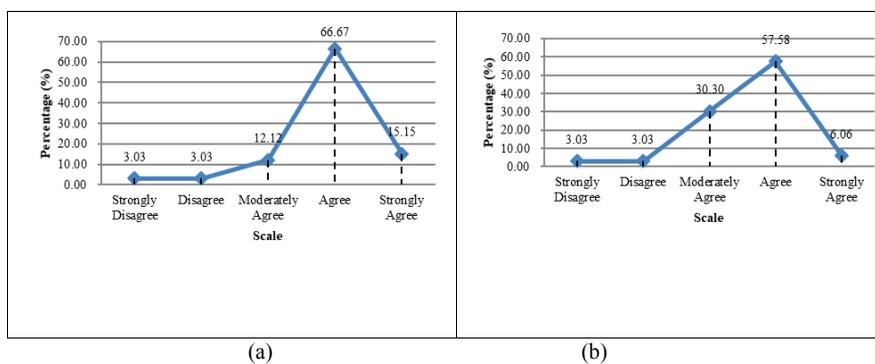


Figure 1. (a) Percentage result item 1; and (b) Percentage result item 2

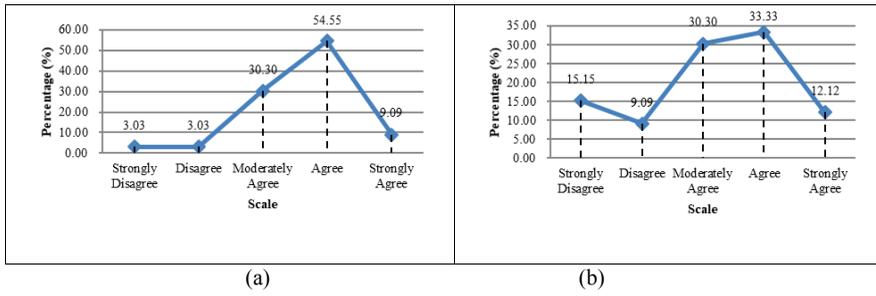


Figure 2. (a) Percentage result item 3; and (b) Percentage result item 4

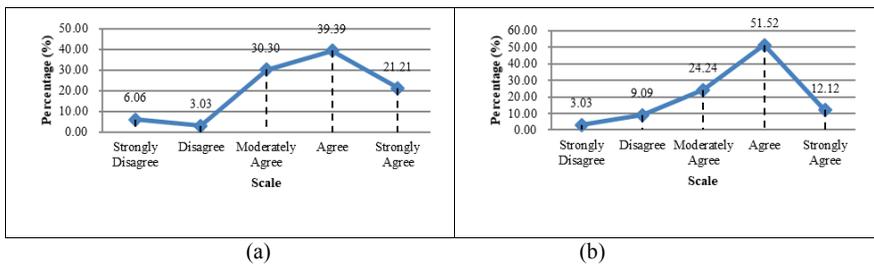


Figure 3. (a) Percentage result item 5; (b) Percentage result item 6

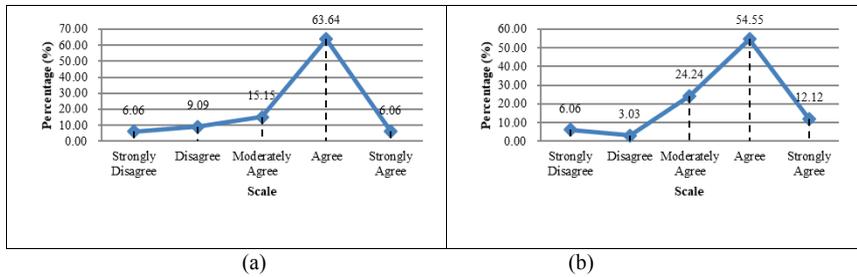


Figure 4. (a) Percentage result item 7; (b) Percentage result item 8

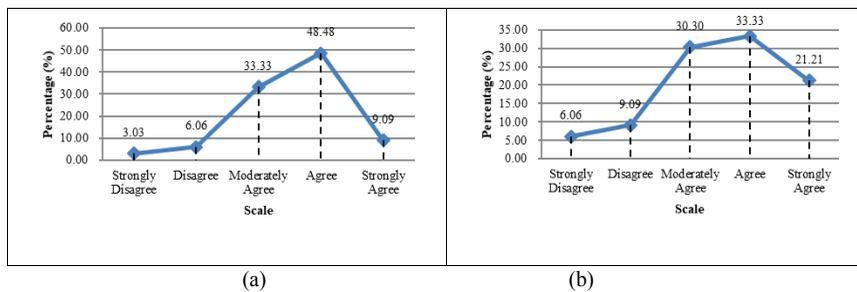


Figure 5. (a) Percentage result item 9; (b) Percentage result item 10

## CONCLUSION

The objective of this preliminary study was to examine students' perceptions of engaging game design in Learning Historical Patriotic Heroes. Descriptive analysis were presented using SPSS. It was found the majority of the respondents are interested in the idea of Learning Historical Patriotic Heroes through game approach finding it a boost to their motivation and engagement to learn. The results also highlight the need to develop a rigorous and engaging game design to learn historical context easier in an interactive way.

## ACKNOWLEDGEMENTS

We would like to thank the Institute of Research Management and Innovation (IRMI) UiTM for supporting this research through iRAGS grant 600-RMI/IRAGS 5/3 (2/2015). We also would like to express our gratitude to all respondents who were directly or indirectly involved in this study.

## REFERENCES

- Baharum, A., & Jaafar, A. (2013). Users' expectation of web objects location: Case study of ASEAN countries. In *International Visual Informatics Conference*, pp. 383–395. CONF, Springer.
- Boyle, E. A., Connolly, T. M., Hainey, T., & Boyle, J. M. (2012). Engagement in digital entertainment games: A systematic review. *Computers in Human Behavior*, 28(3), 771–780. Retrieved from <http://doi.org/10.1016/j.chb.2011.11.020>
- Fang, L., Tan, J., Subramaniam, S., & Loi, M. M. L. (2013). Learning Singapore history in a virtual world. In *Educational Media (ICEM), 2013 IEEE 63<sup>rd</sup> Annual Conference International Council for IEEE*, pp. 1–10.
- Federoff, M. A. (2002). Heuristics and usability guidelines for the creation and evaluation of fun in video games. *FUN in Video Games Thesis University Graduate School of Indiana University*, 52. Retrieved from <http://doi.org/10.1.1.89.8294>
- Foreman, N., Korralo, L., Newson, D., & Sarantos, N. (2008). The incorporation of challenge enhances the learning of chronology from a virtual display. *Virtual Reality*, 12(2), 107–113.
- Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, motivation, and learning: A research and practice model. *Simulation and Gaming*, 33(4), 441–467.
- Ke, F. (2014). An implementation of design-based learning through creating educational computer games: A case study on mathematics learning during design and computing. *Computers and Education*, 73, 26–39. Retrieved from <http://doi.org/10.1016/j.compedu.2013.12.010>
- Mat Zain, N. H., Jaafar, A., & Abdul Razak, F. H. (2016). Enjoyable game design: Validation of Motor-Impaired User GameFlow Model. *International Journal of Computer Theory and Engineering (IJCTE)*, 8(2), 116–121. Retrieved from <http://doi.org/10.7763/IJCTE.2016.V8.1029>
- Radetich, B. L., & Jakubowicz, E. (2015). Using Video games for teaching history. Experiences and Challenges. *Athens Journal of History*, 1(January), 9–22. Retrieved from <http://www.atiner.gr/journals/history/2015-1-1-1-Radetich.pdf>

- Rondon, S., Sassi, F. C., & Furquim de Andrade, C. R. (2013). Computer game-based and traditional learning method: a comparison regarding students' knowledge retention. *BMC Medical Education*, 13(1), 30. Retrieved from <http://doi.org/10.1186/1472-6920-13-30>
- Sampayo-Vargas, S., Cope, C. J., He, Z., & Byrne, G. J. (2013). The effectiveness of adaptive difficulty adjustments on students' motivation and learning in an educational computer game. *Computers and Education*, 69, 452–462. Retrieved from <http://doi.org/10.1016/j.compedu.2013.07.004>
- Sylaiou, S., Mania, K., Karoulis, A., & White, M. (2010). Exploring the relationship between presence and enjoyment in a virtual museum. *International Journal of Human Computer Studies*, 68(5), 243–253. <http://doi.org/10.1016/j.ijhcs.2009.11.002>
- Thillainathan, N., Hoffmann, H., Hirdes, E. M., & Leimeister, J. M. (2013). Enabling educators to Design serious games—A serious game logic and structure modeling language. In *Scaling up Learning for Sustained Impact*, 643–644. Springer.
- Watson, W. R., Mong, C. J., & Harris, C. A. (2011). A case study of the in-class use of a video game for teaching high school history. *Computers and Education*, 56(2), 466–474. Retrieved from <http://doi.org/10.1016/j.compedu.2010.09.007>
- Zain, N. H. M., Jaafar, A., & Razak, F. H. A. (2012). SGameFlow framework: How to experience enjoyment in Serious Game (SG) for Motor Impaired Users (MIU). In *2012 International Conference on Computer and Information Science, ICCIS 2012 - A Conference of World Engineering, Science and Technology Congress, ESTCON 2012 - Conference Proceedings*, 2, pp. 1020–1024.