JOURNAL OF CREATIVE INDUSTRY AND SUSTAINABLE CULTURE

https://e-journal.uum.edu.my/index.php/jcisc

How to cite this article:
Muhammad Danish Haikal Mohd Faizal, & T. Zalizam T. Muda. (2026). Digital game-based learning for Malaysian folklore: A summative evaluation of 'Realm of Myths'.*Journal of Creative Industry and Sustainable Culture,* 5, 169-179. https://doi.org/10.32890/jcisc2026.5.10

DIGITAL GAME-BASED LEARNING FOR MALAYSIAN FOLKLORE: A SUMMATIVE EVALUATION OF 'REALM OF MYTHS'

[1]Muhammad Danish Haikal Mohd Faizal, [2]T Zalizam T Muda

[1,2]School of Multimedia Technology and Communication, University Utara Malaysia, Malaysia

[2]Corresponding author: zalizam@uum.edu.my

Received: 23/7/2026 Revised: 7/9/2026 Accepted: 21/9/2026 Published: 31/10/2026

ABSTRACT

The increasing digital connectivity among modern youth has contributed to a decline in engagement with traditional cultural heritage and local folklore. To address this issue, this study presents and evaluates Realm of Myths, a 2D narrative-based role-playing game (RPG) developed using the RPG Maker MZ engine to preserve and promote Malaysian legends, including Harimau Jadian, Garuda, Jentayu, and Naga Seri Gumum. Guided by the principles of digital game-based learning (DGBL), the game engages digital-native audiences through active combat mechanics and interactive folklore journals that enhance both learning and immersion. A summative evaluation involving 45 youth and adult participants was conducted to assess the prototype's usability, technical performance, and educational effectiveness using a 5-point Likert scale questionnaire. Quantitative findings indicated that the prototype successfully achieved its educational objectives, with educational effectiveness receiving the highest mean score (3.06). Qualitative thematic analysis further revealed that the interactive narrative design played a significant role in enhancing user engagement and the overall effectiveness of the prototype, while also identifying the need for additional JavaScript optimization to improve the responsiveness of combat mechanics. Overall, the findings demonstrate that Realm of Myths is an effective multimedia platform for preserving Malaysian digital heritage and provides a scalable framework for integrating local folklore into interactive entertainment and educational experiences.

Keywords: Cultural Heritage Preservation, Digital Game-Based Learning (DGBL), Malaysian Folklore, Multimedia Design, Role-Playing Game (RPG)

INTRODUCTION

The preservation of cultural heritage and local folklore is facing serious issues in the current digital age. Young people today are viewed as being "digital natives" and learn better in more interactive and visually stimulating learning environments (Prensky, 2001) than through traditional static mediums. The growing extent of this digital connectivity means that, without adapting Malaysian mythic narratives to formats more relevant to younger audiences, these rich stories such as the Harimau Jadian, Garuda, Jentayu, and Naga Seri Gumum illustrated in **Figure 1** are likely to cease to exist in cultural memory.



Figure 1 Visual representations of traditional Malaysian legends integrated into the project.

Digital Game-Based Learning (DGBL) has recently emerged as a viable medium for cultural transmission to fill the educational void. Serious Games provide us with a means in which to move from a passive approach to a more active form of participation in historical content; thus, helping to make the delivery of that information more engaging and pedagogically effective (Anderson et al., 2010; Mortara et al., 2014). Due to the need for engaging tools, the multimedia project Realm of Myths was developed.

Realm of Myths is a 2D narrative RPG game developed with the RPG Maker MZ Engine. Its goal is to preserve and promote the traditional legends of Malaysia through a means of engaging digital natives by active combat and interactions with journals of folklore within the game environment. The game attempts to balance the use of entertainment-driven gameplay with learning and delivery of educational content. The visual identity of the game, characterized by a premium, minimalist, dark-mode interface, is captured in **Figure 2**, which displays the game's main menu.



Figure 2 Main menu interface of 'Realm of Myths'

Realm of Myths has undergone an evaluation process using a two-phase evaluation framework. The first stage of evaluation took place at the time of development to improve user interface design and content relevance, while the second phase of evaluation tested the prototype's usability, technological performance, and educational effectiveness. This study will assess whether this prototype is a valid multimedia application for providing localized folklore within an interactive learning environment.

LITERATURE REVIEW

The theoretical foundation of this study is built upon the intersection of three key academic domains, as illustrated in **Figure 3**.

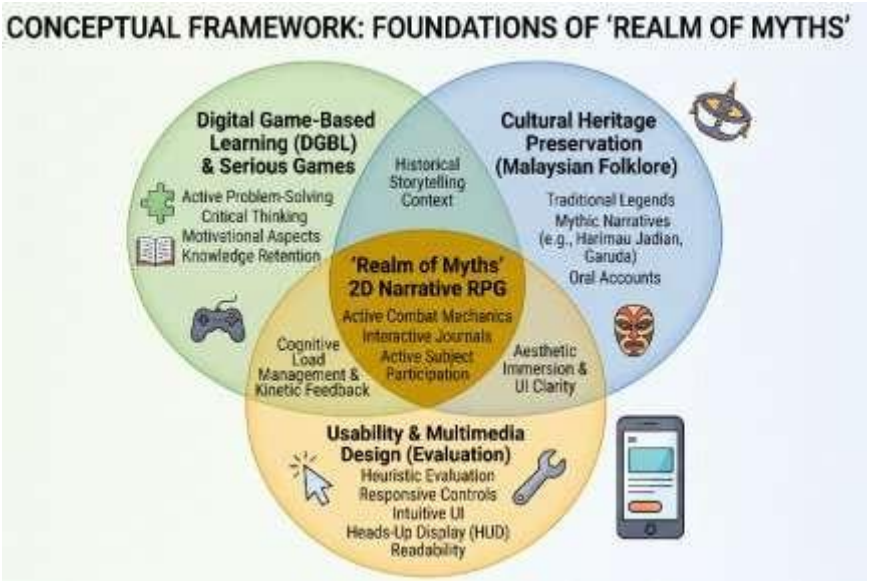


Figure 3 Conceptual framework integrating DGBL, cultural heritage, and usability engineering.

Digital Game-Based Learning (DGBL) and Serious Games

Several recent studies have validated the effectiveness of using digital game (video game) technology as a component of education. For example, Gee (2003) states that digital games with high production value include sound learning principles which encourage active problem solving and critical thinking among players. This idea of using games in the educational process is what is known as Digital Game-Based Learning (DGBL), which also uses the motivational aspects of video games to help facilitate learning new skills and retaining knowledge (Kapp, 2012). Another example of this could be the increasing popularity of "serious games," which are games that have been created for reasons other than entertainment. Serious games have been shown to be effective in a variety of industries including healthcare and history because they allow people to safely participate in simulated environments that provide experiential learning (Michael & Chen, 2005; Connolly et al., 2012).

Cultural Heritage Preservation Through Interactive Media

Integrating DGBL into cultural heritage is a way of revitalising interest in traditional forms of folklore. Studies have shown that serious games can provide context for historical storytelling, making them more accessible and interesting to modern-day children, who are often referred to as digital natives (Anderson et al., 2010). As illustrated in Figure 4, by creating gaming mechanics that integrate culture-based artefacts and myths, such as character dialogue and journal entries, designers have the potential to promote intrinsic motivation within players or learners (Hainey et al., 2016). Mortara et al. (2014) specifically identified narrative-based RPGs as an ideal medium for educating players about different aspects of their culture due to the necessity of researching and understanding the narrative in order for the player to successfully progress through the game world.



Figure 4 Diagram of the continuous cycle of cultural heritage transmission and preservation through interactive RPG mechanisms in 'Realm of Myths'

Usability and Evaluation in Multimedia Design

The success of serious games in terms of pedagogy depends primarily upon usability and technical functionality. If the game interface is not designed intuitively or if the game engine fails to perform sufficiently (i.e., produces an unacceptable amount of delay between users inputting an action into the

game and that action resulting in a visible effect on the screen) then users will experience a cognitive load in learning the educational content due to struggling with the software (Rubin & Chisnell, 2008). Usability engineering principles indicate that creating clear feedback mechanisms and ensuring consistency in visual hierarchy are two key principles for ease of use of software (Nielsen, 1994). In the area of videogames, the usability heuristic evaluation must also take into consideration game-specific elements such as response time for controls and readability of heads-up display (HUD) in active play (Pinelle et al., 2008). Thus, formative and summative evaluation must ensure the multimedia product is both technically sound and educationally viable (Bangor et al., 2008).

METHODOLOGY

Project Design

Realm of Myths was created using RPG Maker MZ. The visual design of the game was intended to provide a dark mode, and the use of an "Impact-Feedback" particle system was intended to create a professional, entertaining atmosphere. As shown in **Figure 5**, the game's battle interface utilizes these design principles to facilitate active combat interaction between the player and mythological entities. The educational content of the game is delivered through Interactive Folklore Journals that are collected and interacted with by players as they engage in active combat interaction.



Figure 5 Battle interface of 'Realm of Myths', illustrating the combat handler, kinetic feedback

Formative Evaluation

A formative evaluation using Expert Reviews approach was developed to mitigate narrative and technical risk during the mid-development phase. The evaluation consisted of utilizing the Heuristic Checklist in conjunction with an observational Think-Aloud Protocol assessed by a panel of three subject matter experts (Multimedia & Interactive Design Specialist, UI/UX Engineering Specialist and Cultural Heritage & Narrative Design Specialist respectively). The evaluators, all with expert-level experience and training in their fields, achieved 100% agreement on the aesthetic visual integration; however, there was only 33.3% agreement on the accuracy of the content of the game due to conflicting oral accounts associated with mythological narratives. As such, an academic disclaimer related to the existence of oral variances has been incorporated into the Myth Journal UI and NPC dialogue has been branched out to represent multiple

perspectives from various elders. Additionally, there was a 66.7% usability agreement indicating a lack of systemic feedback in the combat mode. To resolve this issue, a screen-shake algorithm was utilized (power=4; speed=6; duration=20 frames), high-impact audio and localized particle bursts were utilized to provide strict kinetic feedback.

Summative Evaluation

The use of a quantitative method for summative evaluation indicates that it looks at measures from many years of data gathered from various groups. The sample consisted of 45 youth and/or student participants in a one-time 15-minutes of self-directed experience in an interaction with the game, specifically the combat system, menu, and culturally based. At the end of this session, participants were asked to complete a digital survey instrument on 15 items with a 5-point Likert-type scale (1=Strongly Disagree to 5=Strongly Agree) (Bangor et al., 2008) that assessed usability, technical performance, and educational effectiveness. Participant responses provided qualitative feedback about quality of life and gameplay impediments through open-ended survey responses.

RESULT AND ANALYSIS

Quantitative Findings

The data collected from the 45 participants demonstrated that the prototype successfully met its core objectives. As shown in **Table 1**, Educational Effectiveness was the highest-rated dimension, achieving an average score of 3.06. followed by Usability (3.00) and Technical Performance (2.91). This performance comparison is visually summarized in **Figure 6**, which highlights the success of the pedagogical design alongside the technical baseline of the prototype.

Table 1
Summative Evaluation Metrics (N=45)

Dimension	Average Score (1-5)	Agreement (Agree/Strongly Agree %)
Usability	3.00	36.30%
Technical Performance	2.91	36.67%
Educational Effectiveness	3.06	38.67%

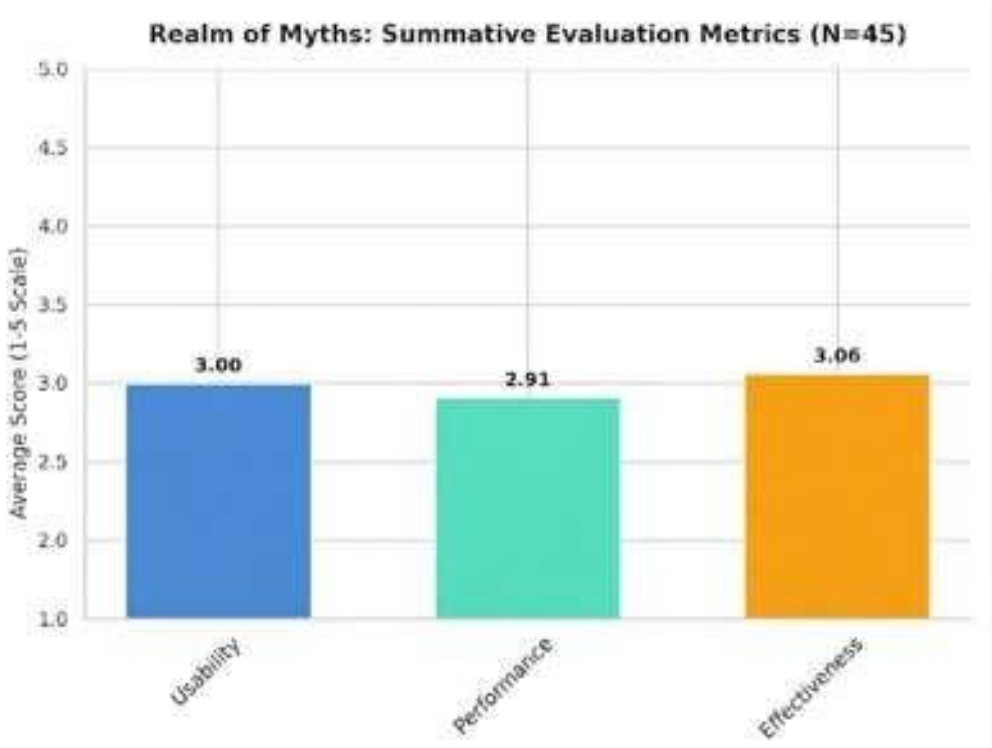


Figure 6 Average score comparison of usability, technical performance, and educational effectiveness across 45 participants

The results from the 45 participants are detailed in **Table 2**, which presents a typology of the survey questions used to gather information, as well as technical examples of each item within each category. The visual layout of this digital survey instrument is provided in **Figure 7.** The mapping of the 15 survey items into usability, technical performance and educational effectiveness used a 5-point Likert scale and open-ended questions to capture user's qualitative feedback about impediments to gameplay and quality of life improvements. By mapping the evaluation categories this way, the structural flow of the survey was able to produce valid and reliable data, forming the basis for the quantitative metrics and qualitative themes presented below.

Table 2
Evaluation Dimensions and Sample Questionnaire Items

No.	Types of questions	Information Collected	Example
1.	Usability	Assesses the intuitiveness of the game interface, visual clarity of the premium dark-mode, and overall ease of navigation.	The game's user interface was easy to navigate and minimized visual distractions.
2.	Technical Performance	Evaluates game engine execution, combat handler responsiveness, and the presence of input delays during fast-paced sequences.	The combat system provided immediate kinetic feedback to my inputs without delay.

3.	Educational Effectiveness	Measures cognitive engagement and how effectively the game transmits cultural wisdom regarding local folklore (e.g., Harimau Jadian, Naga Seri Gumum).	Interacting with the narrative helped me understand the legends better than passive reading materials.
4.	Gameplay & Quality of Life	Gathers user-generated qualitative data regarding gameplay impediments, pedagogical integration desires, and requested enhancements like reward systems.	What additional features or interactive challenges would you like to see implemented?

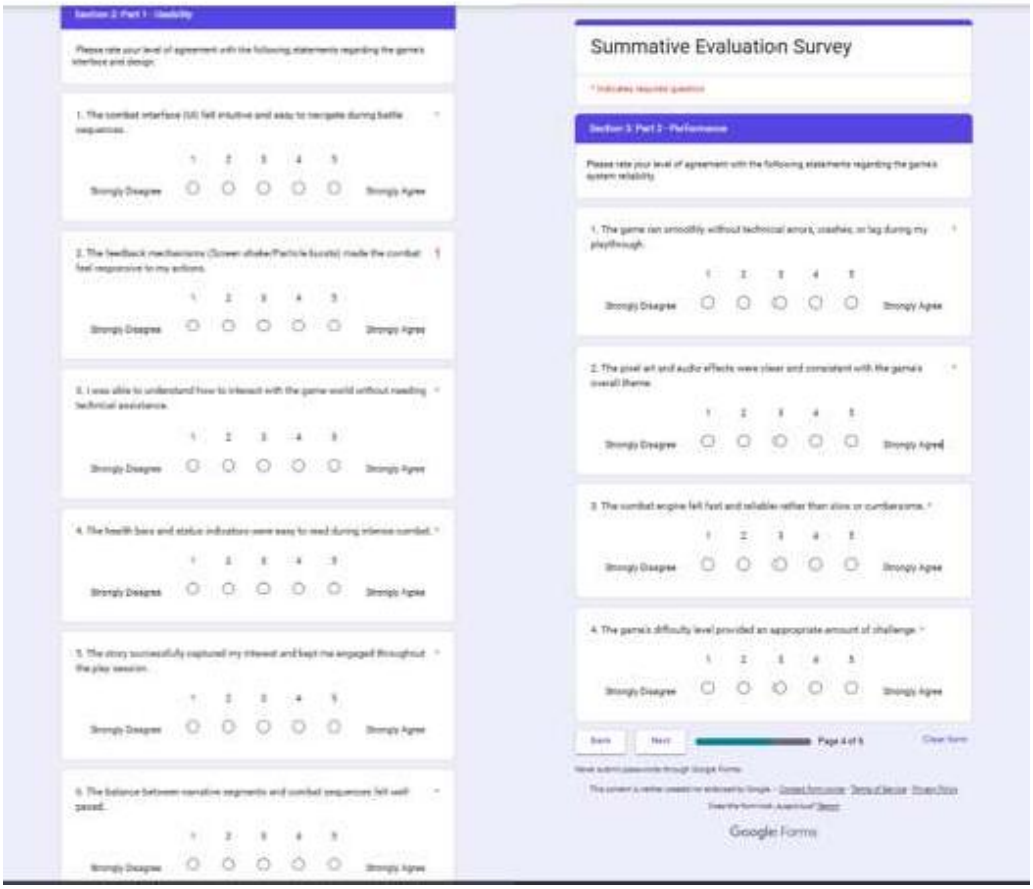


Figure 7 Digital survey instrument utilized for the summative evaluation of *Realm of Myths*.

From the qualitative data from the user-generated open-ended responses there were three recurring themes. First, in the area of Responsiveness, multiple users stated they experienced input delay on the part of the combat handler during fast paced combat sequences; therefore, it appears that the combat handler needs to have a level of optimization relative to JavaScript. Secondly, in the areas of Pedagogical Integration, all users expressed a desire for the inclusion of more active learning and expressed the view that passive journal reading could be replaced with interactive challenge-type assignments. Lastly, there was a substantial request for additional Quality of Life (QOL) enhancements from all users, demonstrating an interest in seeing expanded mechanics opportunities such as reward systems being made available.

DISCUSSION

The results of the evaluation provide evidence that Realm of Myths is an effective multimedia tool for preserving digital heritage. The mean score of 3.06 for Educational Effectiveness strongly conforms to the previously established DGBL framework for success. This result demonstrates that role-playing video games containing storylines may be able to provide cultural wisdom beyond simply rote memorization; in this case, the player was able to use their character as an active agent in transmitting the complex cultures associated with both the Harimau Jadian and Naga Seri Gumum legends through their narrative-based role-playing experience. By creating opportunities for interaction during each quest, the prototype created a much higher level of cognitive engagement than did passive reading materials typically provide for these students.

The visual design elements that were purposefully used within the prototype were an integral part of the user's immersion and reduced the cognitive friction experienced by the user. The use of a premium-dark mode interface provided a minimalist background to minimize clutter and visually eliminate distractions so that the player was able to focus exclusively on the narrative text and tactical combat choices. The aesthetic contrast created by the premium, dark-mode user interface compared to the captivating particle systems used in the formative phase of the prototype provided a contemporary, modern presentation of an ancient digital heritage form/medium that also satisfies the high visual expectations of the current digital-native generation of players.

Although there are numerous successful pedagogical and aesthetic features present within the software, the score of 2.91 in Technical Performance shows there are limitations to the current build due to the engine itself and how it executes in relation to the physical computer that is running it. Because an end user's perspective on how well the overall system is working does and should correlate to how fluidly the combat occurred and how quickly they received kinetic feedback, input delay has been identified as the primary technical bottleneck of the current build. Input delay has a substantial impact on the amount of time it takes a user to engage in combat and how long after combat has ended it takes the system to complete processing and return to gameplay.

One way to transition the software from being a basic functional prototype to being a highly polished educational product is to focus on deep optimization of the JavaScript code running the combat handler so that combat can happen without delays through an optimized game engine. At the same time, although the static folklore journals met their goal of providing accurate historical records, converting the journals into dynamic mini-games with each mini-game having a folklore component would allow the participants to fulfill their request for active learning of folklore through engaging in gameplay. Consequently, converting historical facts into the requirements to complete logical puzzles through gameplay will create an overall seamless transition between entertainment-based gameplay and education-based learning objectives and maximize the pedagogical value of the entire digital heritage system.

CONCLUSION

Summative evaluation reveals that the project has successfully achieved its main pedagogical and technical goals. Being highly effective in educational terms, the project proves that DGBL approach can be used successfully to involve digital natives in exploring the myths of Malaysia and bridge the gap between studying the history passively and experiencing it actively. The high Educational Effectiveness scores

presented in the quantitative analysis confirm that the main mission of the game to protect and promote the traditional legends appealed to the target audience, which means that narrative-driven mechanics can serve as a valid substitute for the text-based one. At the same time, the results of the qualitative analysis reveal the crucial role that the interactive narrative plays in immersing players in the process and maintaining their interests, thus providing the solid pedagogical basis for further development in this direction. While being a complete, fully functioning multimedia project ready for playing, this game is still limited by some factors, which should be considered in the future. In terms of technical performance, the results of the testing show that the use of the engine and further JavaScript optimization are needed to improve combat fluidity. Furthermore, in the future, it will be necessary to shift from static folklore journals to dynamic, lore-based interactive mini-games to respond to participants' desire for learning challenges. Finally, the significance of this project lies in the fact that it contributes to digital preservation approaches substantially. This project shows that it is possible to integrate the culture of a nation into modern interactive entertainment not only to preserve it but to keep the tradition alive. Offering a flexible and scalable approach, this project serves as an example of how it is possible to create a multimedia game out of the intangible cultural heritage of any region. This research opens the way for further investigations in this field.

ACKNOWLEDGEMENT

This research was not supported by any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. This paper is based on a Final Year Project conducted at the School of Multimedia Technology and Communication (SMMTC), Universiti Utara Malaysia (UUM). The author expresses sincere gratitude to Sir Tuan Zalizam bin Tuan Muda for his invaluable supervision, guidance, and constructive feedback throughout the development of this academic project. Special appreciation is extended to UUM for providing the necessary cooperation and access. Additionally, the author is deeply thankful to all participating experts, peers, and individuals involved for their vital input and dedication. The successful completion of this project would not have been possible without the collective support, feedback, and encouragement from all involved parties.

AUTHOR CONTRIBUTIONS

The conception, design, and execution of this study—including material preparation, data collection, and data analysis—were collaboratively performed by all authors.

CONFLICT OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

Informed consent was obtained from all individual participants included in the study.

AI DISCLOSURE STATEMENT

The author acknowledges the use of Gemini by Google solely for basic grammar verification, spelling correction, and style optimization during the drafting process. The tool was not utilized to generate, analyze, or interpret any research data. The final manuscript remains entirely the responsibility of the author.

REFERENCES

Anderson, C. A, Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., Rothstein, H. R., & Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: a meta-analytic review. *Psychological Bulletin, National Library of Medicine*, 136(2), 151-73. https://doi: 10.1037/a0018251.

Bangor, A., Kortum, P. T., & Miller, J. T. (2008). An empirical evaluation of the system usability scale. *International Journal of Human-Computer Interaction*, 24(6), 574–594. https://doi.org/10.1080/10447310802205776

Branch, R. M. (2010). *Instructional design: The ADDIE approach*. Springer US. https://doi.org/10.1007/978-0-387-09506-6

Camuñas-García, D., Cáceres-Reche, M. P., Cambil-Hernández, M. de la E., & Lorenzo-Martín, M. E. (2024). Digital game-based heritage education: Analyzing the potential of heritage-based video games. *Education Sciences*, 14(4), 396. https://doi.org/10.3390/educsci14040396

Connolly, T. M, Boyle, E. A., MacArthur, E., Hainey, T., & Boyle, J. M. (2012). A systematic literature review of empirical evidence on computer games and serious games. *Journal of Computers and Education,* 59(2), 661-686. https://doi.org/10.1016/j.compedu.2012.03.004

Hainey, Thomas & Connolly, Thomas & Boyle, Elizabeth & Ford, Amanda & Razak, Aishah. (2016). A systematic literature review of games-based learning empirical evidence in primary education. Computers & Education. 102. 10.1016/j.compedu.2016.09.001.

Kapp, K. (2012). The gamification of learning and instruction: Game-based methods and strategies for training and education. San Francisco, CA: Pfeiffer

Gee, J. P. (2003). *What video games have to teach us about learning and literacy*. Palgrave Macmillan

Keller, J. M. (2016). Motivation, learning, and technology: Applying the ARCS-V motivation model. *Participatory Educational Research*, 3(2), 1–15. https://doi.org/10.17275/per.16.06.3.2

Mayer, R. E., & Fiorella, L. (2021). Introduction to multimedia learning. In *The Cambridge Handbook of Multimedia Learning* (pp. 3–16). Cambridge University Press. https://doi.org/10.1017/9781108894333.003

Micheal, D. & Cheng, S. (2005). Seriuos Games: Games That Educate, Train, and Inform, Thomson Course Technology

Mohd Yusof, S. N., Md Ibharim, L. F., & Sukirman, S. (2024). Malaysia folklore interactive game development: Tun Mamat adventure mission. *Journal of ICT in Education*, 11(1), 9–23. https://doi.org/10.37134/jictie.vol11.1.2.2024

Mortara, M. (2014). Learning cultural heritage by serious games. *Journal of Cultural Heritage*, 15(3), 318-325. https://doi.org/10.1016/j.culher.2013.04.004.

Nielsen, J. (1994). *Usability engineering*. Morgan Kaufmann.

Pinelle, David, Wong, N., & Nelson. (2008). Heuristic evaluation for games: Usability principles for video game design. *Conference on Human Factors in Computing Systems - Proceedings*. 10.1145/1357054.1357282.

Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the Horizon*, 9(5), 1–6. https://doi.org/10.1108/10748120110424816

Rubin, J., & Chisnell, D. (2008). Handbook of Usability Testing: How to Plan, Design and Conduct Effective Tests.

Saldaña, J. R. (2024). Video games as modern mythic narrative: Universal archetypes, cultural continuities, and global interactive mythopoiesis. https://doi.org/10.5281/zenodo.17623839

Vandewalle, A. (2024). Video games as mythology museums? Mythographical story collections in games. *International Journal of the Classical Tradition*, 31(1), 90–112. https://doi.org/10.1007/s12138-023-00646-w

Ventoulis, E., & Xinogalos, S. (2023). "AR The Gods of Olympus": Design and pilot evaluation of an augmented reality educational game for Greek mythology. *Multimodal Technologies and Interaction*,7(1).https://doi.org/10.3390/mti7010002