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Enhancing Hajj Education through Interactive Multimedia Game-Based Learning

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Abstract: The Hajj pilgrimage, a fundamental aspect of Islamic education, often lacks engaging educational tools to convey its experiential and cultural significance. However, traditional methods fail to bridge the gap between theoretical knowledge and practical understanding. Therefore, this study presents the development and evaluation of the "Islamic Insight: Hajj Board Game," an interactive 2D Game-Based Learning (GBL) tool designed to educate students about the Hajj pilgrimage. The game was developed using Agile methodology, incorporating Unity, Canva, and Microsoft Visual Studio tools. The primary objectives were to design a comprehensive storyboard, create the game, and evaluate user experience. The evaluation phase utilized the Game Experience Questionnaire (GEQ) to gather insights from 39 respondents. The GEQ results indicated a positive reception, with high ratings in competence (mean = 4.26) and immersion (mean = 3.85). Participants found the game engaging and educational, with positive affect scoring a mean of 3.35. However, the challenge aspect received a moderate rating (mean = 2.58), and the negative effect was low (mean = 2.18), suggesting minimal negative emotions during gameplay. Overall, the Hajj Board Game successfully provided an engaging and informative experience, enhancing students' understanding of the Hajj pilgrimage. Future research should focus on improving accessibility and expanding the game to mobile platforms to reach a broader audience.

Keywords: *Hajj board game, Game-based learning, pilgrimage*

1. Introduction

The Hajj pilgrimage, one of the five pillars of Islam, is a significant religious duty that every able-bodied Muslim must undertake at least once in their lifetime if they have the means to do so (Shahul et al, 2021). Despite its importance, traditional teaching methods often fail to convey the experiential and cultural dimensions of this sacred journey, leading to a disconnect between theoretical knowledge and practical understanding. This gap is particularly evident in educational settings where students may struggle to grasp the full significance of Hajj through conventional instructional approaches.

To address this challenge, the Hajj Board Game was developed as an innovative educational tool that leverages Game-Based Learning (GBL) methodologies. GBL integrates game mechanics into the learning process to enhance engagement and motivation, making complex subjects more accessible and enjoyable for students (Cerra et al., 2022). By incorporating interactive multimedia elements, the Hajj Board Game aims to provide a more immersive and engaging learning experience, bridging the gap between theoretical knowledge and practical understanding.

Development of the Hajj Board Game was done through Agile, organized and iterative process steps. This allowed us to make our work iterative, drawing on continuous feedback to be sure that the game matched both what was required in an educational sense and also what would feel fun to its intended audience. The Game Experience Questionnaire (GEQ) was used to evaluate user experience aspects which have been reported as competence, immersion, challenge, positive affect and negative affect elements together with learning impacts on the game.

In conclusion, the Hajj Board Game represents a significant advancement in educational tools for teaching the Hajj pilgrimage. By combining GBL methodologies with interactive multimedia, the game offers a unique and effective way to enhance students' understanding and appreciation of these important religious pillars of Islam. Hence it is able to help students understand better the pilgrimage.

2. Literature Review

Overview of Game-Based Learning: Game-Based Learning (GBL) is the use of digital gaming within a learning environment to motivate students in their education tasks. GBL has been used in classrooms as well as computer-based environments to ensure that high levels of motivation and enjoyment are observed among students (Taub, Azevedo, Bradbury, & Mudrick, 2020) GBL uses interactive multimedia-including text, images, audio, video and interactive elements – to create immersive digital learning spaces. It increases student engagement, encourages more active learning and gives a conducive environment to explore educational content.

Employing interactive multimedia in educational settings, an improvement of learning and reinforcement of knowledge for students (Kumala et al, 2021). It allows students to participate in work through ideas and get immediate responses. According to Maharani and Asyhari (2020), interactive multimedia is practical and effective because it can deliver a more flexible learning experience, using the elements of educational technology. In addition, GBL has been shown to increase learner motivation and engagement (Chen et al, 2022). Consequently, GBL accompanied by multimedia-related interactivity will foster greater knowledge-based as well as engagement for the learners.

Definition of Interactive Multimedia: Interactive multimedia Is a creative art-based technology that uses the computer to interact with user input to display digital information such as text, graphics images, and videos (Farrer, 2023). Such games generally interweave gameplay and narrative with educational content, to not compromise game mechanics with additional learning criteria. The interactive part of the event is also an integral layer insomuch as it enables participants to interact, make choices, and move through virtual worlds—creating a perception of presence and participation. Several studies that have recently been conducted also supported the beneficial impact of interactive multimedia on students' learning experiences (Nur et al., 2020; Hisey, Zhu & He, 2024).

Benefits of Game-Based Learning. GBL has lots of benefits that can generate a motivating and immersive educational environment. Multimedia presentations also excite the students that a study by Kumala (2021) has made clear to maintain student knowledge and engagement when it comes to learning. In addition, the GBL provides tailored-made learning which is adapted to each student and promotes real-time practice and feedback which facilitates monitoring of own progress in turn influences self-regulatory strategy. In many cases, interactive computer-based learning is proven to be better than traditional lectures, it seems more flexible and accommodating (Hartt & Mostafapour, 2020; Eltahir et al., 2021).

Hajj Education in Games: Students need to study Hajj as it will give them an in-depth understanding of the pilgrimage and why it is needed within Islam. Hajj Board Games can make students learn about the rituals and procedures of Hajj through these interactive board games. Septiani et al. (2020) suggested that it affects the formation of student character. Well, through playing the game, students will get more familiar with the topic of Hajj and therefore they become more interested and motivated to study that aspect of their religion. Find Hisey, Zhu, & He (2024) and Xa & LIu (2021): Interactive media games make learning more fun.

Current Challenges and Limitations in Hajj Education: Lack of learning methods is a challenge for Hajj education. Interactive and multimedia-based games come as an innovative way to counter these hurdles and provide an immersive experience that can engage students. Recent research is considered to be done to aid in the efforts including gamification elements such as rewards and challenges enhancing active learning and improved memory (Hartt, Hosseini & Mostafapour, 2020; Eltahir et al., 2021).

Hajj Education Malaysia: Hajj education for all Muslims holds especially valuable life lessons for students. Some studies indicate the significant role of interactive multimedia in self-improvement and resolving issues (Latifah, Ma'arif, & Afyuddin, 2024; Nikmah et al, 2022). For example, based on previous research and observation there is still much use of traditional teaching methods in Malaysia due to sociocultural factors, lack of resources or belief that the conventional methods work well (Syawaludin, Gunarhadi and Rintayati, 2020; Irawan, Rahardjo and Sarwanto, 2020). However, a few recent researches indicate that interactive multimedia within GBL outperforms traditional media (Hartt, Hosseini & Mostafapour, 2020; Eltahir et al., 2021).

Game-Based Learning Games: Interactive multimedia in GBL refers to digital content that allows users to engage dynamically and interactively. These games typically feature captivating visuals, realistic sound effects, intricate narratives, and dynamic gameplay elements.

Existing Interactive Multimedia Games include:
Edpuzzle - Edpuzzle is an online platform that enables teachers to create engaging video lessons by adding questions, quizzes, and annotations to videos. It promotes active learning and supports various video formats, allowing teachers to monitor student progress and give personalized feedback.
Kahoot! - Kahoot! is a well-known game-based learning platform that allows teachers to create and host interactive quizzes, surveys, and discussions. Participants answer questions using their devices, and the game occurs in real-time with a leaderboard displaying scores. Kahoot! Provides a vast library of ready-to-play games or allows educators to develop custom quizzes tailored to specific topics or curricula.
Quizizz - Quizizz is an interactive quiz game where teachers can create and share quizzes with their students. Participants can compete as individuals or teams, and the game includes a live leaderboard to enhance excitement and motivation. Quizizz features a wide range of question formats, making it versatile for various subjects and educational goals.

Summary: The review of related literature indicates that game-based learning (GBL) and interactive multimedia improve educational experiences. Game-Based Learning (GBL) — Game-augmented learning wherein games are used to complete the learning engagingly and entertainingly. The inclusion of multimedia elements is becoming increasingly important in the creation of engaging and interactive learning environments.

Even though traditional approaches to teaching may still be popular in Malaysia, it seems that the benefits of interactive multimedia elements in GBL are well accepted. Studies demonstrate that interactive multimedia surpasses the effectiveness and efficiency of traditional media 2-fold. Examples: Multimedia games (interactivity), e.g. Edpuzzle, Kahoot!, and in any educational scenario other tools such as Kahoot!, and Quizizz stand as testaments of GBLs capability. Such platforms offer an engaging and interactive learning experience to enable active learning and personalized instruction.

In conclusion, we can see from the literature review that educators should emphasize blending game-based learning and interactive media into teaching to enhance student engagement, motivation, and learning performance.

3. Methodology

The methodology for developing the Hajj Board Game, an educational tool designed to enhance students' understanding of the Hajj pilgrimage, followed a structured and iterative approach using the Agile methodology. Initially, a comprehensive requirement analysis identified essential features and functionalities, followed by creating detailed game flowcharts and storyboards to visualize the game's structure and user experience. These visual tools ensured a well-organized and engaging game design. During development, Unity was used for game development, Canva for graphic design, and Microsoft Visual Studio for coding. This combination facilitated the creation of interactive 3D environments and user-friendly interfaces. The testing phase involved various types of testing to ensure the game functioned correctly, with continuous feedback integrated to resolve issues. The deployment phase included finalizing and releasing the game, ensuring it was accessible to students. The review phase evaluated the game's performance and user experience, incorporating feedback for iterative improvements. The Game Experience Questionnaire (GEQ) as shown in Table 1 below was used to assess various aspects of user experience, including competence, immersion, challenge, positive affect, and negative affect, providing valuable insights into the game's impact. This structured methodology, supported by detailed flowcharts and storyboards, successfully created an engaging and educational game that effectively teaches students about the Hajj pilgrimage.

Table 1: Adopted GEQ for Project Evaluation

Factor	Code	Question	NAA (1)	S (2)	M (3)	F (4)	E (5)
Competence	Q1	I felt skillful					
	Q2	I felt competent					
	Q3	I was good at it					
Immersion	Q4	It was aesthetically pleasing					
	Q5	I felt imaginative					
	Q6	I found it impressive.					
Challenge	Q7	I thought it was hard					
	Q8	I felt challenged					
	Q9	I had to put a lot of effort into it.					
Positive Affect	Q10	I felt content					
	Q11	I thought it was fun.					
	Q12	I enjoyed it					
Negative Affect	Q13	I thought about other things					
	Q14	I found it tiresome.					
	Q15	I felt bored					

Design and Development

The design and development of the Hajj Board Game, aimed at enhancing students' understanding of the Hajj pilgrimage, followed a structured and iterative approach using the Agile methodology. Initially, a comprehensive requirement analysis identified essential features and functionalities, followed by creating detailed game flowcharts and storyboards to ensure an engaging user experience. The development phase utilized Unity for game development, Canva for graphic design, and Microsoft Visual Studio for coding, resulting in a functional prototype. Testing ensured the game functioned correctly, with continuous feedback integrated to resolve issues. The deployment phase involved finalizing and releasing the game, ensuring it was accessible to students. The review phase evaluated the game's performance and user experience, incorporating feedback for iterative improvements. The Game Experience Questionnaire (GEQ) assessed various aspects of user experience, including competence, immersion, challenge, positive affect, and negative affect, providing valuable insights into the game's impact. This structured approach successfully created an engaging and educational game, demonstrating significant potential as an educational tool for learning about the Hajj pilgrimage.

4. Results and Discussion

This part aims to evaluate the Hajj Board Game as an educational tool and user experience. The primary instrument used for this assessment was the Game Experience Questionnaire (GEQ), which assesses multiple user experience components such as competence, immersion, challenge, and positive and negative effects. There were 39 respondents in all who contributed through evaluation, ultimately yielding three alternate impacts for map and game readings.

Demographic data presented in Table 2 below revealed that the majority of participants were male [n = 8 (61.5%) and n =5 (38.5%) female]. The majority of participants were aged between 22-25 years (71.8%) followed by the age group 18-21 years old (12.8%). This demographic breakdown signals the game is for young adult consumers, similar to its in-game education aspect.

Table 2: Demographic Of Respondents

Question	Range	Frequency	Percentage (%)
Gender	Male	24	61.5
	Female	15	38.5
Age Group	18-21	5	12.8
	22-25	28	71.8
	26-30	4	10.3
	31 and above	2	5.1

The GEQ results provided a comprehensive view of the participants' experiences with the Hajj Board Game. The findings are categorized into five key aspects: competence, immersion, challenge, positive affect, and negative affect. Table 3 below shows the result of GEQ.

The participants had considerably positive attitudes toward their perceived competence during gameplay. For the statement "I felt skillful" (Q1), 59% of participants used the highest rating of 5, and 40% rated it as a 4, so this can be considered overall positive at about 92.3%. For instance, in the case of "I felt competent" (Q2), quite similarly 46.2% rated it as 4 and 46.2% rated Q5 out of the possible maximum score into an overall positive grading of 92.3%. When it came to the question "I was good at it" (Q3), almost half of the respondents gave a rating of 4 rather than 5 -48.7%- that figure paired with an identical 48.7% also opting for rating level 5, led to a solidly positive response on this score, overall rate at an annual high-score for all Qs: namely 97.4%. These findings are indicative of participants feeling highly competent, thereby suggesting that the game supported high-quality skill development and mastery.

Table 3: Overall Mean Percentages Comparison

Game Experience	Total Mean
Competence	4.26
Immersion	3.85
Challenge	2.85
Positive Affect	3.35
Negative Affect	2.18
Overall Total Mean	16.49

The immersion side of things, too, got a thumbs up. For Q4: "It was aesthetically pleasing", 59% of respondents gave a score of 5 while 40% scored it as 4. Question "I felt creative"(Q5): 46.2% of the participants chose the response alternative "4", with an additional 46.2% choosing this variant as the maximum score, "5". For comparison, for "I found it impressive" (Q6) a total of 48.7% rated at a 4, and the other 48.7% thought it enough to warrant the highest rating of a 5. The fact that they are so consistently top-rated indicates that this game does a good job of engaging users with the visual and imaginative aspects, creating an immersive experience.

The challenge aspect received mixed responses. For "I thought it was hard" (Q7), 32.3% rated it as moderately challenging, while 29% provided a slightly challenging rating. The question "I felt challenged" (Q8) had a balanced distribution, with 29% choosing moderately and 28.2% opting for slightly challenging. For "I had to put a lot of effort into it" (Q9), 32.3% rated it as moderately challenging, while 28.2% provided a slightly challenging rating. These responses suggest that the game presents a moderate level of difficulty, which may vary based on individual player skills and experiences.

Participants conveyed diverse sentiments in the positive affect category. For "I felt content" (Q10), 51.3% rated it as 4, while 15.4% gave it the maximum score of 5. The question "I thought it was fun" (Q11) saw 59% rating it as 4, with an additional 28.2% awarding the highest score of 5. For "I enjoyed it" (Q12), 48.7% chose a rating of 4, and an impressive 48.7% opted for the maximum score of 5. These results indicate that the game provides

a generally positive emotional experience, with participants finding it enjoyable.

The negative affect category showed varied responses. For "I thought about other things" (Q13), 59% rated it as moderately distracting, while 15.4% provided the highest score of 5. The question "I found it tiresome" (Q14) had 51.3% rating it as slightly tiresome, with an additional 28.2% opting for moderately tiresome. For "I felt bored" (Q15), 56.4% chose a slightly bored rating, and 28.2% selected moderately bored. These responses suggest that while the game generally maintains user engagement, there are areas where improvements can be made to reduce distractions and enhance sustained interest.

The overall game experience was evaluated across the five key aspects, with the following total mean scores: Competence (4.26), Immersion (3.85), Challenge (2.58), Positive Affect (3.35), and Negative Affect (2.18). The overall total mean across all sections was approximately 3.244, representing a moderately positive game experience. In terms of percentage, the overall total mean was around 64.88%, indicating that, on average, participants had a positive but not overwhelmingly high experience with the game.

The results of the evaluation indicate that the Hajj Board Game is effective in providing an engaging and educational experience for users. The high ratings in the competence and immersion categories suggest that the game successfully supports skill development and creates an immersive learning environment. The positive affect ratings further reinforce the game's ability to provide an enjoyable experience. However, the mixed responses in the challenge and negative affect categories highlight areas for improvement. The moderate level of difficulty may need to be adjusted to better match the skill levels of different players. Additionally, efforts should be made to minimize distractions and enhance sustained engagement to reduce negative effects.

The demographic findings suggest that the game appeals to a young adult audience, which is relevant for the educational context. The positive feedback from this demographic indicates that the game effectively meets the needs and preferences of its target audience. Overall, the Hajj Board Game demonstrates significant potential as an educational tool for teaching about the Hajj pilgrimage. The iterative development process, guided by user feedback and the Agile methodology, has resulted in a game that is both engaging and educational. Future improvements should focus on addressing the identified areas for enhancement to further optimize the user experience and educational impact.

5. Summary

In conclusion, the Hajj Board Game has proven to be an effective educational tool, providing a positive and engaging learning experience for users. The evaluation results highlight the game's strengths in supporting skill development, creating an immersive environment, and providing an enjoyable experience. The identified areas for improvement offer valuable insights for future enhancements, ensuring that the game continues to meet the needs and preferences of its target audience. Through continuous refinement and user feedback, the Hajj Board Game can further solidify its role as a valuable educational resource. For future work, expand the game's content to include the rituals and significance of Umrah. This will provide a comprehensive learning experience covering both major Islamic pilgrimages.

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