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ADAPTIVE MAZE-BASED ISLAMIC EDUCATIONAL GAMES USING MOORA METHOD

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Abstract

The degradation of students' knowledge in Islamic education is increasingly concerning, driven by the negative influence of internet exposure. This study develops an educational game, Harta Karun Pengetahuan, as an interactive gamified learning medium incorporating core Islamic content. The game applies adaptive difficulty adjustment using the Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) method based on player performance. The success of the MOORA method in providing recommendations for players is shown by how players will be directed to the next maze according to the success of the previous game. The game was tested with 20 students (aged 18–21) with two approaches evaluation, the System Usability Scale (SUS) and the Igroup Presence Questionnaire (IPQ), achieving an average SUS score of 84 (indicating high usability) and an overall IPQ score of 4.64 (indicating strong player immersion). Results showed that General Presence and Involvement had the highest average scores, indicating that players felt emotionally engaged and present in the virtual learning world. Although the Realism dimension was generally positive, it suggests room for improvement in visual and interactive fidelity. The findings demonstrate that integrating Islamic content into digital games can provide meaningful learning experiences and support students in achieving cognitive, affective, and psychomotor competencies in a contextual IRE setting.

Keywords: Game Adaptation, Game base learning, Maze, MOORA, Multi-Criteria Optimization

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I. INTRODUCTION

The rapid advancement of information technology has significantly impacted various aspects of life, including the realm of education [1]. One innovation in education is the development of educational games, which not only provide entertainment but also function as a means of interactive learning [2]. Educational games combine interactive elements, challenges, and active learning, creating an interesting and effective learning experience for players [3]. As a country with the largest Muslim majority population in the world, Indonesia has a high need for relevant and modern Islamic educational content [4]. The integration of technology in education, especially through educational games, offers a great opportunity to convey Islamic values creatively and interactively [5]. Islamic educational games have the potential to support the formation of moral and spiritual-based character in the younger generation, while introducing Islamic values in a form that is easy to understand and fun for motivation [6]. Globally, the trend of technology-based education is growing rapidly, making educational games [7] one of the most promising learning media to form a generation that is not only intellectually intelligent, but also has strong morals and ethics [8].

The development of Islamic educational games has gained increasing urgency as educators seek more engaging and effective methods for teaching religious content in the digital era. Integrating Islamic knowledge into dynamic, challenge-based game environments has been shown to enhance student learning by moving beyond rote memorization and

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encouraging active participation[9]. This approach aligns with constructivist and experiential learning principles, where learners build knowledge through contextualized interaction[10]. Gamification strategies—including challenges, feedback, rewards, and social elements—have proven effective in improving motivation, focus, and learning outcomes across diverse subjects[11], and hold similar promise for Islamic education. Engaging younger generations—such as millennials and Gen-Z—who are immersed in digital media, through Islamic-themed digital games, may also foster deeper reflective engagement and strengthen critical thinking[12].

Educational maze games can provide a personalized, interactive learning experience tailored to the characteristics of students, including critical thinking and decision-making skills[13]. These principles can be effectively adapted to Islamic education contexts, where students are invited to engage with value-based content through exploration and problem-solving in a structured visual environment. Furthermorem, incorporating games such as maze games into classroom instruction significantly improves student motivation and learning outcomes, particularly in language acquisition. The study highlighted how interactive, game-based activities increased pronunciation skills among young learners due to heightened engagement and the enjoyable learning atmosphere[14]. Similarly, Harta Karun Pengetahuan is designed not only to deliver Islamic educational content, but also to strengthen learner engagement through adaptive gameplay, interactive narrative, and meaningful feedback mechanisms. This supports mindful learning where students are not just passive recipients of information, but active participants in constructing knowledge through contextually embedded game taskswadu.

In the world of games, one important element that can increase the realism and fun of the game is weather conditions, especially rain [15]. Rain can significantly affect various visual aspects and game mechanics. Weather conditions such as rain will add interesting visual effects and significantly affect game mechanics because simulating rain in game videos requires rendering using shaders to bias the view on the graphics device [16]. Rain can affect visibility, player movement speed, or even the appearance of surprise elements such as monsters or special items. This realistic detail in video games done using reconstruction methods to produce accurate, smooth details and baked lighting [17]. Rain and other weather-related changes may influence player movement speed, visibility, and the appearance of surprise components, raising the difficulty and player engagement [18,19]. Previous research obtain the importance of selection systems in gaming contexts [20]. It is crucial to develop a selection system capable of forecasting and adjusting in-game rain conditions to enhance the gaming experience and preserve gameplay balance in improving user experience.

Using educational games will show several elements that help increase player satisfaction so that they don't get bored playing [21]. This part can be fulfilled by implementing an adaptive system or periodic adjustments as the main challenge [22]. Most educational games apply normal and equal difficulty for each user. This causes several problems such as the tendency to not continue because it is considered too difficult or too easy. This is what causes the game system that is created to be less than optimal and ineffective. As a result, dynamically adjust game approach is made for players [23]. One of the methods chosen for dynamically adjusting applications is the MOORA method. It is expected to be able to address dynamic selection for rain conditions more optimally, thereby enhancing the game's realism and challenge.

First introduced by Brauers and Zavadskas, MOORA (Multi-Objective Optimization on the Basis of Ratio Analysis) is one of many multi-criteria optimization methods considered as an objective method, designed to address decision-making problems while incorporating both benefit and cost criteria [24]. The advantage of this method is that it is part of the compensatory method with independent attributes, as well as an alternative with the initial qualitative value that can be converted into quantitative attributes. This makes the calculation simple and flexible on all types of criteria, resulting in a final product in the form of a recommendation database with high accuracy [25]. Considering its widespread use in previous studies, this method presents a promising avenue for exploration in maze-based learning games [26]. This system aims to enhance the digital learning experience by providing a more interactive, engaging, and effective approach to conveying Islamic educational values through gaming [27].

II. CONCEPTUAL FRAMEWORK

A. Game Based Learning

Games based learning is a learning method that uses games packaged in a fun format to achieve learning objectives [28]. According to research, this game involves students to be active and collaborate with each other [29].

Gamification elements such as challenges, rewards, and storylines are integrated to motivate students to be more enthusiastic about learning [30]. Through these elements, direct interaction with learning materials becomes better and can be accepted by students [31]. Game-based learning will increase students' learning motivation[32], faster problem solving, and critical thinking. Educational games that integrate Islamic educational values can have a positive impact on the formation of students' character. The game can be an effective means of conveying moral and ethical values, as well as introducing scientific concepts in a way that is easy for children to understand. Thus, educational games can replace conventional learning methods that tend to be monotonous, while increasing student participation in the learning process [33]. The game developed in this study that adopts a game-based learning approach is titled "Harta Karun Pengetahuan". The approach uses the MOORA method to set the game level [34]. In addition, this game utilizes weather elements to increase player engagement. The objective in this game is to answer the questions presented, try to stay alive from changing weather and attacking enemies. By using this setting the level of difficulty adjustment method, the game can adjust the challenges faced by players based on their performance and decisions [35].

B. MOORA

The Decision Support System (DSS) is a computer-based system designed to help decision makers in interpret complex and thorough data information [36]. Making better decisions can be aided by this system's assistance with data analysis, alternative evaluation, and choice generation [37]. A computer-based tool called a Decision Support System (DSS) was created to help decision makers interpret complex and thorough data. Making better decisions can be aided by this system's assistance with data analysis, alternative evaluation, and choice generation. Using DSS has many advantages, particularly when it comes to management and business [38]. MOORA (Multi-Objective Optimization on the basis of Ratio Analysis) is a multi-criteria decision-making method that can be used to optimize several conflicting criteria simultaneously.[39,40]. the MOORA method can be used to assist decision-making in determining the best game based on several conflicting criteria, such as price, quality, and features.[41].

However, DSS can also be collaborated on game-based learning in this study for a dynamic weather selection system. MOORA (Multi-Objective Optimization on the Basis of Ratio Analysis) is a multi-criteria optimization method that allows rational and objective assessment of various alternatives based on several criteria. This method works by normalizing the value of each criterion and comparing the ratio of each alternative to the relevant criteria, both those that are beneficial (benefit) and those that must be minimized (cost) [42]. The technique has grown to be one of the most often used methods for making decisions, such as narrative studies [43] and scholarship recipients [44]. It also use in manufacturing environment [45], material selection [46], and best techniques [47]. In other studies, several collaborations and comparisons were carried out such as the MOORA method extended with the fuzzy concept [48], the SAW and MOORA methods were also compared using Rank Order Centroid (ROC), and MOORA with fuzzy Fermatean [49].

III. METHOD

A. Research Design

The "Harta Karun Pengetahuan" is a learning-based game developed through the Unity application with the C# programming language.

Fig. 1 shown FSM system for the game to find hidden treasures at certain locations in the maze, then each time they find chests there is a question task that must be answered correctly related to Islamic knowledge. Another task is related to special flowers that must be watered by the player to get important information related to the chest questions. On the other hand, players will be faced with demon NPCs who patrol certain locations to attack and reduce the player's HP. Victory in this game is obtained when the player succeeds in finding the chest, watering the flowers, answering questions correctly, and keeping health points intact. While defeat is obtained when the player runs out of HP when attacked by the demon NPC. The point system will reflect the player's skills in certain challenges so that it contributes to the final score of the game. MOORA here plays a role in calculating the final score to determine whether the player will be given a maze that is more difficult or easier than the previous game. This educational element provides a fun way to gain Islamic knowledge while honing the player's strategy in facing real-time challenges.

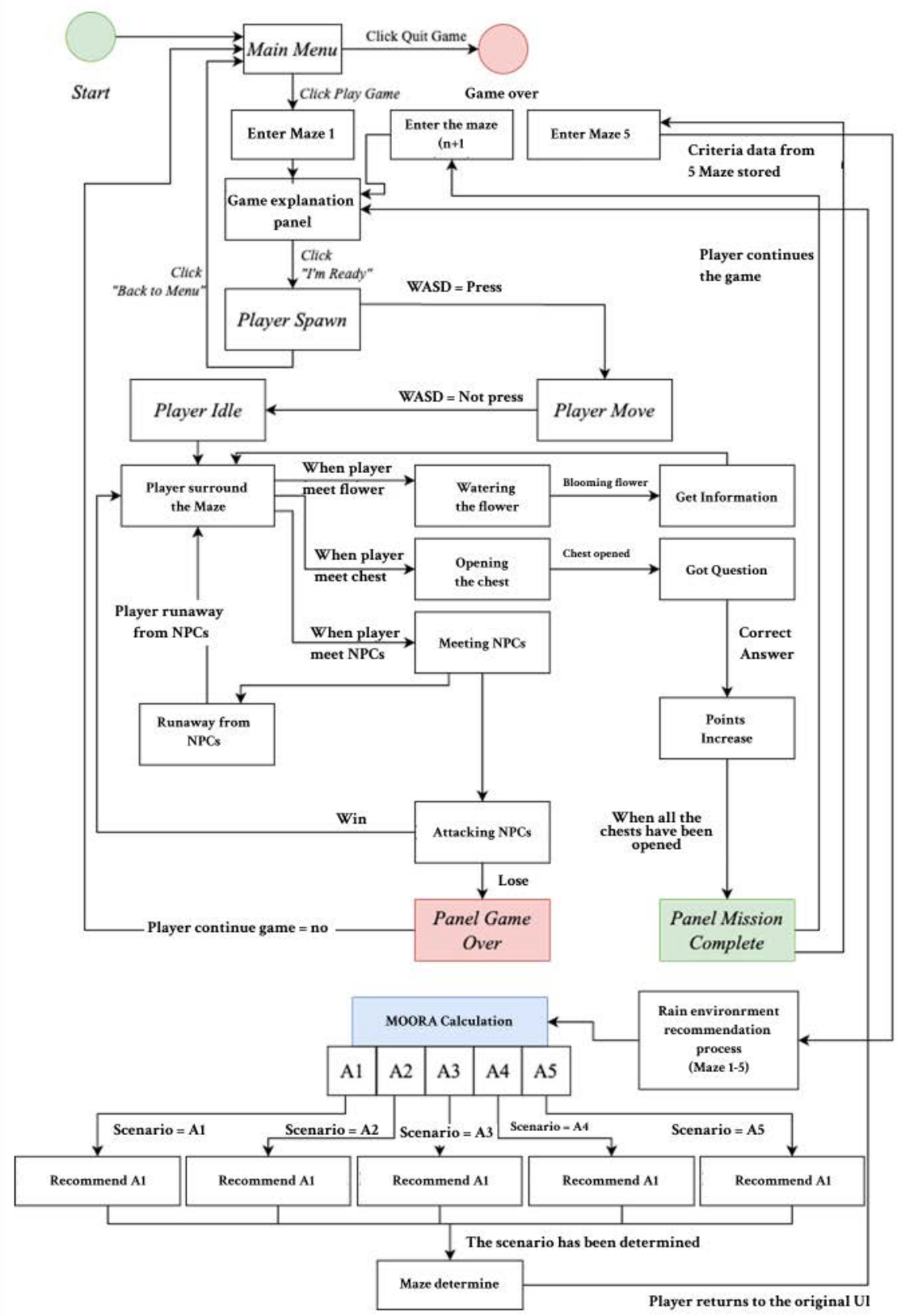

Figure 1. FSM system

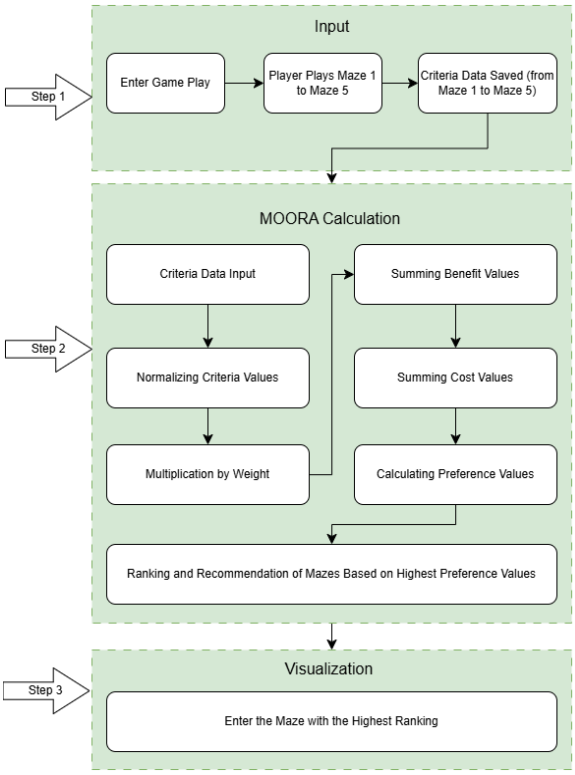

Figure 2. Propose system with MOORA for maze game.

This research adopts a mixed-methods approach that combines quantitative gameplay performance data and qualitative user feedback [50], [51]. The study aims to evaluate the effectiveness of the "Harta Karun Pengetahuan" game in enhancing Islamic knowledge and player engagement.

B. Research Procedures

The process of research procedures consists of several main steps. It starts with the player entering the game and then getting one of the mazes. After that, the final score results will be used as input data metrics in MOORA Calculation. Then a normalization process is needed because the range of values is too far between criteria. Continued by multiplying weights, summing benefit and cost values, and finally issued as a ranking with the best value being the value with the largest preference values. This is what will lead the player to the maze with the highest rank value. In general, the model is based on [52] and can be seen in Figure 1.

- Player performance data collection. Data is taken from the results of five maze games that have been played by players. Each criterion has a different meaning and type, which is used to assess the player's performance based on certain parameters that are measured in the game. The criteria considered in the assessment, where each criterion is categorized as Cost or Benefit, depending on its impact on the overall evaluation of the player [53]. The benefit criterion is the criterion that is desired to be maximized, while the cost criterion is the criterion that is desired to be minimized. Data is collected automatically through the in-game PlayerPrefs system, which stores player performance information in each maze.
- Data normalization. Normalization aims to make the value of each criterion comparable and comparable objectively, even though the units or scales of the criteria are different. The normalization process uses the formula based on [54]:

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}} \qquad (1)$$

Where:
r_{ij} = Normalized Values of alternatives *i* and *j*
x_{ij} = The original value of the criteria

- Weighting of criteria. Weights reflect the level of importance or priority of each criterion in the evaluation process. More important criteria will be given a greater weight, while less important criteria will be given a smaller weight. To ensure objectivity and reduce subjective bias, the weights in this study were derived using the Analytic Hierarchy Process (AHP)[55]. The normalization result is multiplied by the weight of each criterion to produce a final weighted value.
- Reference value calculation. The preference value is calculated by adding the weighted values of the benefit criteria and subtracting the weighted values of the cost criteria. The maze with the highest preference value will be the best alternative recommended for the player

$$P_i = \sum_{benefit} W_j \times r_{ij} - \sum_{cost} W_j \times r_{ij} \quad (1)$$

Where:
P_i = Alternative preference value *i*

- Alternative ranking. Alternatives are ranked based on the calculated MOORA value. The alternative with the highest value is considered the best choice, as it shows the best performance according to the

established criteria. The maze with the highest preference value will be ranked first, indicating that it is the best choice for the player [56]. The ranking is done by ordering the preference values from highest to lowest. The alternative (maze) with the highest preference value is considered the best alternative recommended to the player to play next

C. Testing and Data Analysis

The testing is done through two approaches, namely validation of the MOORA algorithm is done by analyzing the system output using player simulation data. This test aims to ensure that the algorithm works according to the design. Then, Testing is done by involving players who play the game "Harta Karun Pengetahuan". Player performance data is analyzed to evaluate the effectiveness of the system in adjusting game conditions. In this study, two primary instruments were used to evaluate the game: System Usability Scale (SUS) and Igroup Presence Questionnaire (IPQ). These instruments were selected due to their wide application in assessing both technical usability and the immersive experience of digital applications, particularly in interactive educational settings.

SUS is a standardized questionnaire developed to measure perceived usability. It consists of 10 items that assess various aspects of a system's ease of use, complexity, and learnability. The SUS produces a single score that represents the overall usability of the system. Key usability criteria assessed through SUS include: frequency of use intention, complexity, ease of use, need for support, system integration, consistency, learnability, confidence, and effort to learn.

IPQ evaluates the user's psychological sense of presence in virtual environments. It comprises four main dimensions:

- Spatial Presence: The sense of being physically situated within the virtual environment.
- Involvement: The degree of attention and emotional engagement with the content.
- Realism: The perceived fidelity and believability of the virtual environment.
- General Presence: The overall subjective experience of being "present" in the virtual world.

IV. RESULT AND DISCUSSION

A. MOORA calculation testing

Testing was carried out by testing 20 users in several game sessions. Then the evaluation used the System Usability Scale (SUS) to measure the level of system usability, and the Igroup Presence Questionnaire (IPQ) to measure the level of player presence in the game environment. Criterion data were collected from players' performance after completing five mazes [57]. The highest points are obtained in maze 5 and the lowest points in maze 1. The data presented in Table 1.

Data normalization produces values with the same scale, namely from 0 to 1. The results of data normalization for each criterion are presented in Table 2.

Table 1. Player Performance Data.

Alternative	C1 (Playing Time)	C2 (Point Player)	C3 (Distance Traveled)	C4 (Total Correct)	C5 (Total Wrong)	C6 (Remaining HP)
A1 (Maze 1)	3	5	780	4	5	80
A2 (Maze 2)	6	5	697	5	6	82
A3 (Maze 3)	8	6	586	4	8	90
A4 (Maze 4)	6	4	856	3	5	87
A5 (Maze 5)	4	7	356	6	4	60

Table 2. Criteria Data Normalization.

Alternative	C1 (Playing Time)	C2 (Point Player)	C3 (Distance Traveled)	C4 (Total Correct)	C5 (Total Wrong)	C6 (Remaining HP)
A1 (Maze 1)	0.2364	0.4069	0.5146	0.3961	0.3881	0.4445
A2 (Maze 2)	0.4729	0.4069	0.4599	0.4951	0.4657	0.4556
A3 (Maze 3)	0.6305	0.4883	0.3866	0.3961	0.6209	0.5001
A4 (Maze 4)	0.4729	0.3255	0.5648	0.2970	0.3881	0.4834
A5 (Maze 5)	0.3152	0.5697	0.2349	0.5941	0.3105	0.3334

Table 3. Weighted Value.

Alternative	C1 (Playing Time)	C2 (Point Player)	C3 (Distance Traveled)	C4 (Total Correct)	C5 (Total Wrong)	C6 (Remaining HP)
A1 (Maze 1)	0.0544	0.0488	0.1132	0.0436	0.0621	0.0711
A2 (Maze 2)	0.1088	0.0488	0.1012	0.0545	0.0745	0.0729
A3 (Maze 3)	0.1450	0.0586	0.0851	0.0436	0.0993	0.0800
A4 (Maze 4)	0.1088	0.0391	0.1243	0.0327	0.0621	0.0773
A5 (Maze 5)	0.0725	0.0684	0.0517	0.0653	0.0497	0.0533

Table 4. Maze Preference Value.

Alternative	Total Benefit	Total Cost	Preference Value	Ranking
A1 (Maze 1)	0,2297	0,1635	-0,0662	2
A2 (Maze 2)	0,2844	0,1762	-0,1083	3
A3 (Maze 3)	0,3294	0,1822	-0,1473	5
A4 (Maze 4)	0,2951	0,1491	-0,1460	4
A5 (Maze 5)	0,1739	0,1870	0,0132	1

The values are multiplied by the weights for each criterion. The results are presented in Table 3 above. This calculation requires the total costs to be subtracted from the total benefit. The results of the preference calculation for each maze are shown in Table 4. The results above show that maze 5 has the highest result (0.0132) and will be selected as the next map for players to play. It can be concluded that players have expertise in game speed, getting the highest points, successfully answering questions and still have a lot of remaining HP in maze 5. Players are considered capable of getting difficult mazes thanks to their expertise in playing this game. On the other hand, the lowest result was obtained in maze 3 (-0.1473) because players have a longer playing time, and their ability to answer questions correctly is still low. This shows the success of the MOORA method in providing recommendations for players

B. Visualization Results

The “Harta Karun Pengetahuan” game consists of five mazes designed with gradually increasing levels of complexity. Each maze has a unique layout that presents different challenges to players, both in terms of navigation and obstacles. Mazes-1 to Maze-5 are specifically designed to collect player performance data based on variables such as playing time, points earned, distance traveled, correct answers, incorrect answers, and remaining lives. The MOORA method was used to determine the maze difficulty level that best suited the player's performance. Each maze has different characteristics in terms of the number of questions, the difficulty level of the questions, and visual complexity such as the number of paths and the size of the area. MOORA output, in the form of preference scores, was used to rank each maze. The maze with the highest preference score was considered the best choice for the player to play next. Conversely, the maze with the lowest preference score indicated a higher level of challenge and was tailored for players with better performance or previous experience. Here is a visualization and description of each maze.

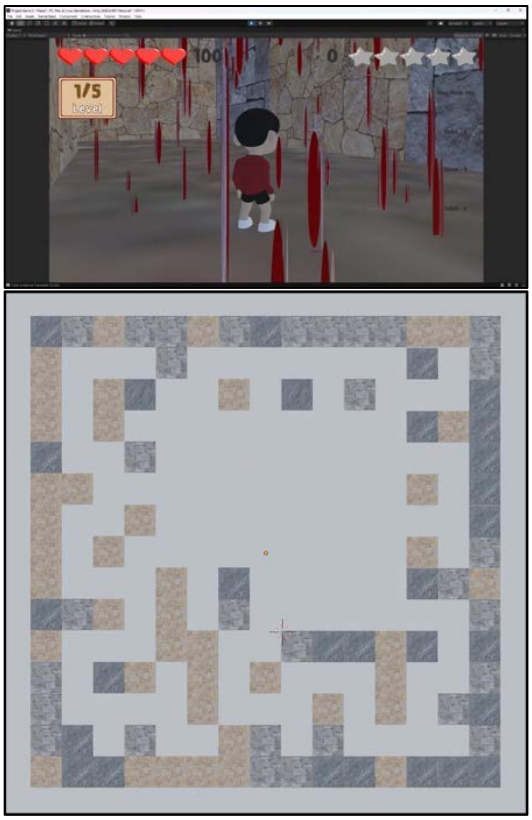

Figure 3. (a) Gameplay with low intensity rain, (b) Maze 1 with low difficulty

Fig. 3 shows maze 1 as a basic maze with low complexity. The path in this maze is simple and relatively easy to navigate. The goal is to introduce players to the basic mechanics of the game, so that players can understand the controls and rules of the game without the stress of significant obstacles. The appearance of Maze 1 where the rain is in the form of red water droplets with low intensity. Players need to adapt to the visual disturbance, but it is not too heavy to start the game.

Fig. 4 shows maze-5 with the highest level of difficulty. The layout of this maze is designed to maximize the number of branches and paths and more obstacles to avoid. It can be concluded that players need maximum decision-making skills to succeed in passing this maze.

Fig. 5 illustrates the Information Panel, which presents key Islamic concepts in a concise and accessible format. This panel serves as a cognitive primer, allowing players to reflect on Islamic teachings before encountering related challenges.

Figure 4. (a) Gameplay with high intensity rain, (b) Maze 5 with high difficulty

Figure 5. Information Panel

Figure 6. Question Panel

Meanwhile, Fig. 6 features contextualized questions grounded in Islamic subjects, encouraging players to apply their knowledge to solve problems and make decisions. Each maze contains questions and challenges based on Islamic historical events (such as the story of the prophet Muhammad, Battle of Badr, the Hijrah, and the Isra' Mi'raj) with a different number of questions and difficulty, enhancing contextual learning and facilitating the internalization of Islamic Religious Education material. This supports character development, such as honesty and patience, which are instilled throughout the gameplay.

Fig. 7 displays the feedback provided to players after completing the Treasure of Knowledge game. This feedback is designed to provide clear and measurable information about player performance based on six main criteria: Game Duration, Player Score, Distance Traveled, Number of Correct Answers, Number of False Answers, and Final Score. The data is displayed in a table showing the results from Maze 1 to Maze 5. In addition, the system provides recommendations based on the results of the Fuzzy-MOORA analysis, such as suggestions to repeat certain mazes with a better target time.

Figure 7. User testing

The maze visualization in the “Harta Karun Pengetahuan” game is not only designed for engagement, but also as a meaningful metaphor for the journey of Islamic learning. In Islamic education, the learning process is not only about acquiring knowledge, but also about forming strong moral character and critical reflection. Each maze represents a structured path that students must navigate, mirroring the concept of sirat al-mustaqim (the straight path) as a symbolic goal in Islamic teachings.

While traversing the maze, students are presented with questions, obstacles, and decision points that require them to apply their understanding of Islamic values and teachings. This aligns with active learning principles, where students are not passive recipients but actively construct knowledge through challenge-based experiences. These challenges are embedded with Islamic content—such as recognizing ethical behavior, understanding the pillars of faith, which reinforces religious concepts in a contextualized, interactive manner. Through this learning-by-doing experience, the game promotes character formation by fostering:

- Honesty and responsibility, as players must answer questions truthfully and complete the levels with persistence,
- Curiosity and critical thinking, as they explore and reflect on Islamic knowledge within a game framework,
- Spiritual awareness, through reflective prompts and values-oriented feedback that relate to real-life Islamic ethics.

Figure 8. User testing

C. Usability Testing

The search for respondents was conducted in order to test this game with a target of 20 users who were students from Islamic universities who had Islamic religious subjects [58]. They are active students, aged 18–22 years, who have at least taken a Religious Education course, also individuals who have an interest in educational games.

In figure 8, user was given directions before conducting direct testing with access the tutorial menu and are required to play the entire maze (maze 1 to maze 5). The fairly long process makes the player's interaction with the game more complex, so that the obstacles and difficulties can be recorded. Then, users are asked to fill out two types of questionnaires (the System Usability Scale (SUS) [59,60] and the Igroup Presence Questionnaire (IPQ) which will help researchers evaluate the system that has been created.

Generally, SUS is more massive and widely used because it has few question variables that are more understandable and the calculations tend to be easy interactive contexts such as augmented reality (AR)[61] and successfully applied the SUS to evaluate a virtual reality rhythm game designed to introduce Pencak Silat[62]. Therefore, in this study, the SUS was deemed relevant for evaluating the educational game, as it offers a standardized yet efficient way to capture the user's overall perception of usability. However, this is considered non-specific and limited in measuring several aspects of the user, so the Igroup Presence Questionnaire (IPQ) calculation is added as a second evaluation option. IPQ measures the "presence" or presence of users in a virtual environment or interactive system [63]. This includes aspects such as involvement, realism,

and the feeling of being “in” the system. The IPQ has more detailed questions to uncover specific issues [64]. Table 5 below shows a comparison of questions that have been adapted to this game.

Table 5 contains a list of questions used to evaluate the usability of the "Harta Karun Pengetahuan" Game. Questions related to usability (i.e. questions 5, 9, and 10) will be analyzed using the System Usability Scale (SUS) method. The total score of the SUS questionnaire will range from 0 to 100, where a score above 68 indicates that the game has a good level of usability. The table above also displays a list of questions derived from the Igroup Presence Questionnaire (IPQ), which is used to measure the feeling of "presence" or the presence of users in the virtual world of the "Harta Karun Pengetahuan" Game. These questions cover four main aspects: Spatial Presence, Involvement, Realism, and General Presence. The results of this questionnaire will provide an in-depth understanding of how strong the immersive experience is felt by players while interacting with the game. After the data is obtained, the data is analyzed, the System Usability Scale (SUS) approach will be used for questions related to usability (questions 5, 9, and 10). The scores from these questions will be calculated to get a total score ranging from 0 to 100. The scores from each question will be processed to get a comprehensive understanding of how the game is rated by users, both in terms of usability and the aspect of presence in the game.

Table 5. List of SUS and IPQ questionnaire questions.

No.	Usability Criteria	SUS	Presence Dimension	IPQ
1.	Desire for Reuse / Satisfaction	I think I'll play this game again	Spatial Presence	I feel as if I am truly inside the world of "Harta Karun Pengetahuan." (Spatial Presence)
2.	Complexity	I found the game complicated to use	Spatial Presence	I feel as if the game world surrounds me. (Spatial Presence)
3.	Ease of Use	I found the game easy to use	Spatial Presence	I feel as if I can reach out and interact with objects in the game. (Spatial Presence)
4.	Dependability	I needed help from another person or technician to use this game	Spatial Presence	The environment within the game feels real to me. (Spatial Presence)
5.	Functionality	I felt the game's features worked as they should	Involvement	I am very focused on what happens in the game. (Involvement)
6.	Design Consistency	I felt there were many inconsistencies in the game	Involvement	I am deeply engaged in every mission and task in the game. (Involvement)
7.	Learnability	I felt other people would figure out how to use this game quickly	Involvement	I feel emotionally connected to elements in the game, such as finding treasure chests or encountering NPCs. (Involvement)
8.	Navigation Clarity	I found the game confusing	Involvement	I am highly intrigued by the elements within the game. (Involvement)
9.	Usability Smoothness	I didn't find the game to be challenging to use	Realism	The game environment feels very realistic to me. (Realism)
10.	Learning Curve	I need to get used to it first before using this game	Realism	My interaction with objects in the game feels natural and realistic. (Realism)
11.			Realism	The gameplay experience does not feel far from reality. (Realism)
12.			Realism	The visuals and sounds in the game enhance the sense of realism. (Realism)
13.			General Presence	I feel as if the game world becomes part of my reality while playing. (General Presence)
14.			General Presence	I find it difficult to return to reality after being immersed in this game. (General Presence)

Table 6. Final results of SUS calculations.

No.	Respondent	Total	Value (Total x 2,5)
1.	R1	36	90
2.	R2	31	78
3.	R3	39	98
4.	R4	29	73
5.	R5	36	90
6.	R6	34	85
7.	R7	33	83
8.	R8	38	95
9.	R9	35	88
10.	R10	36	90
11.	R11	36	90
12.	R12	31	78
13.	R13	32	80
14.	R14	34	85
15.	R15	30	75
16.	R16	21	53
17.	R17	36	90
18.	R18	35	88
19.	R19	33	83
20.	R20	38	95
Average score (final result)			**84**

Table 7. Respondents' Scores Based on IPQ.

No.	Respondent	Spatial Presence	Involvement	Realism	General Presence
1.	R1	4.8	4	3.5	3
2.	R2	4.2	3.75	4	6
3.	R3	5.6	5.25	5.25	7
4.	R4	4.6	3.25	4.75	3
5.	R5	4	4.75	2.75	5
6.	R6	4.8	4.25	4.5	5
7.	R7	4.4	4	5.25	5
8.	R8	5.6	4.5	5.25	7
9.	R9	5.6	4.75	4.25	7
10.	R10	4.4	4.75	4	4
11.	R11	5.6	5.25	5.25	6
12.	R12	3.8	4.5	4	6
13.	R13	4.8	4.25	4.25	5
14.	R14	4.4	5.25	3.75	5
15.	R15	4.4	4	4.25	4
16.	R16	3.2	2.75	3.25	5
17.	R17	5.2	4.75	5	6
18.	R18	5.4	4.75	4.75	7
19.	R19	3.8	4.75	3.25	4
20.	R20	4.6	4	3.5	6

Table 6 shows the average SUS score of 84, explaining that the Game "Harta Karun Pengetahuan" has a very good level of ease of use, considering that this score is far above the SUS threshold of 68. This score indicates that most respondents feel comfortable using the game, both in terms of navigation, control, and game interface. This reinforces that this game is quite intuitive and user-friendly, although there are still some inputs that can be used for further improvement. Based on the SUS graph below, a score of 84 is in the "Excellent" category, which indicates that this game has a very good level of usability and can be widely accepted by users.

This means that the game's navigation, controls, and interface do not hinder the learning process, allowing students to focus on the educational content rather than being hampered by technical difficulties. Furthermore, content such as questions about Islamic Beliefs (Aqidah), Morals, Worship, and Islamic History can be accessed smoothly and played repeatedly,

strengthening information retention. Good usability also increases the frequency and duration of interactions, which results in improved understanding of the material.

Table 7 shows the respondents' scores based on the IPQ (Igroup Presence Questionnaire) which includes four dimensions, namely Spatial Presence, Involvement, Realism, and General Presence. Each dimension reflects the subjective experience of respondents while using the system.

Table 8 shows the results of descriptive statistics of the dimensions of Spatial Presence, Involvement, Realism, and General Presence measured using the Igroup Presence Questionnaire (IPQ). Based on the table, it can be seen that the number of respondents for each dimension is 20 people. In the Spatial Presence dimension, the average score given by respondents is 4.66, with a standard deviation of 0.67, indicating that the majority of respondents feel quite present in the virtual game world. The minimum value for this dimension is 3.2, while the maximum value is 5.6, indicating variations in presence experiences among respondents. The first quartile (25%) for this dimension is 4.94, meaning that 25% of respondents gave a score below this value. The median (50%) is at 5.25, while the third quartile (75%) is at 6, indicating that most respondents gave a positive presence score above the median value.

For the Involvement dimension, the average score was 4.38, with a standard deviation of 0.63, indicating a slightly larger variation in engagement experiences compared to the other dimensions. The minimum score was 2.75, while the maximum score was 5.25. The first quartile (25%) was at 4.75, indicating that 25% of respondents felt less involved in the game. The median (50%) was 5.75, and the third quartile (75%) was at 6.5, indicating that most respondents felt quite involved in the game activity, although some showed very high levels of involvement. In the Realism, the average score was 4.24, with a standard deviation of 0.74, indicating that the majority of respondents considered the game's virtual world to be quite realistic. The minimum score given by respondents was 2.75, while the maximum score was 5.25. The first quartile (25%) was at 5, the median (50%) was at 5.25, and the third quartile (75%) was at 6.13, indicating that most respondents gave above average ratings. Although a small number of respondents felt that the virtual world was less realistic, the majority gave ratings indicating that the visual elements and environment of the game were quite supportive of the real experience.

On the General Presence dimension, the average respondent score was 5.3, with a standard deviation of 1.23, indicating a greater variation in the general sense of presence in the virtual world compared to the other dimensions. The minimum score was 3, while the maximum score was 7. The first quartile (25%) was at 4.88, the median (50%) was at 5.5, and the third quartile (75%) was at 6.5. These results indicate that the majority of respondents felt generally quite present in the virtual world, although there were some individual differences in the experience of presence. These descriptive statistics indicate that the majority of respondents gave positive ratings on each IPQ dimension. The General Presence dimension recorded the highest average, indicating that most respondents felt that the virtual world of the game was able to provide a fairly immersive and realistic experience. However, the Realism dimension had a slightly lower average, indicating that there is still room to improve the quality of visual elements, animations, or interactions in the game to increase the perception of realism for some respondents.

The IPQ dimensions (Spatial Presence, Involvement, Realism, and General Presence) measure the extent to which students feel present and engaged in the virtual learning world. High levels of Involvement and General Presence indicate that students are emotionally connected to the learning mission, such as discovering a "treasure" of Islamic knowledge.

Table 8. Descriptive Statistics.

	Spatial Presence	Involvement	Realism	General Presence
Count	20	20	20	20
mean	4.66	4.375	4.2375	5.3
std	0.67	0.63	0.74	1.23
min	3.2	2.75	2.75	3
25%	4.9375	4.75	5	4.875
50%	5.25	5.75	5.25	5.5
75%	6	6.5	6.125	6.5
max	5.6	5.25	5.25	7

They perceive the learning process as not merely a passive activity, but rather an exploratory and meaningful experience. Realism and Spatial Presence make the learning context (such as an Islamic history-themed setting, a mosque visualization, or educational characters) feel real, making the material easier to understand and remember.

D. Discussion

The “Harta Karun Pengetahuan” game is specifically designed to support the achievement of learning objectives in Islamic Religious Education using a contextual approach. This game presents core material such as Islamic Belief, Morals, Worship, and Islamic Cultural History, packaged in missions and challenges relevant to real life. Expected learning outcomes include cognitive competence. Students are able to understand and explain the pillars of faith, the pillars of Islam, and important events in Islamic history such as the Treaty of Hudaybiyah, the Battle of Badr, and the Isra' Mi'raj, which are presented in the questions in each maze. Later, Affective competence shown by instilling noble moral values such as honesty, responsibility, and patience, reflected in game mechanics such as management, item selection, and evaluation of player decisions.

The gamification approach employed encourages students to actively engage, not simply passively receiving material, but rather to build understanding through exploration, reflection, and contextual decision-making. Each maze is designed with adaptive difficulty levels and contextual questions, specifically those about Islamic history. Evaluation using the IPQ and SUS showed that high engagement and general presence scores contributed to the internalization of Islamic values. This demonstrates that the integration of religious content into a digital game significantly fosters students' understanding and interest in Islamic Religious Education (PAI) material in a more meaningful context. To improve external validity in future studies, this study suggests to consider testing the game with broader age groups (e.g., children or teenagers as the primary target users) and expanding the number of respondents.

V. CONCLUSION

Based on the results of data analysis and discussion, it can be concluded that the educational game "Treasure of Knowledge" has succeeded in becoming an effective and enjoyable learning medium in the context of Islamic Religious Education. The integration of Islamic material with a gamification approach and adaptive difficulty adjustment using the MOORA method provides a contextual and interactive learning experience for players. Evaluation using the IPQ (Information Quality Question) showed that most respondents felt emotionally involved and had a strong sense of presence in the game's virtual world, which supports the internalization of Islamic values. The General Presence and Involvement dimensions received the highest scores, while Realism showed potential for improvement in visual quality and interaction. Overall, this game can encourage the achievement of cognitive, affective, and psychomotor competencies in Islamic Religious Education learning through a more meaningful, exploratory approach.

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