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Gamified AI Analysis as Learning Media for Islamic Education on Students' Learning Outcomes

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Abstract

This research investigates the effectiveness of a gamified AI learning medium, specifically the "Marbel Shalat" game, on the learning outcomes of second-grade students in Islamic Religious Education (PAI) at SDIT. Employing a quantitative research design with a One-Group Pretest-Posttest approach, the study involved a sample of 36 students of SDIT Tahfizh Daarul Huda Sariak Laweh and SDIT Al-Kautsar Bukittinggi. Data were collected through pre-tests and post-tests, alongside observations and questionnaires to assess the impact of the gamified learning medium. The pre-test results indicated that only 15 students (41.67%) achieved mastery of the material, while the post-test results revealed a significant improvement, with 33 students (91.61%) reaching mastery. Statistical analysis confirmed the reliability and validity of the assessment instruments, demonstrating a very strong positive correlation (r = 0.860) between the pre-test and post-test scores. Furthermore, a t-test indicated a statistically significant difference in learning outcomes before and after the intervention (t = 9.83). The findings suggest that the "Marbel Shalat" game effectively enhances student learning in PAI, highlighting the potential of gamified AI as a valuable educational tool for improving student engagement and understanding of complex subjects.

Keywords: gamified AI, learning outcomes, islamic religious education (PAI)

1 Introduction

The advancement of technology today has brought us into an increasingly complex and advanced world. One of the technological developments that has attracted attention and changed the way we interact with the world is artificial intelligence, better known as Artificial Intelligence [1]. Artificial Intelligence is a technology that uses robots that have the ability to think like humans [2]. Artificial Intelligence can be likened to an intelligent machine because with a collection of working systems, it can facilitate human performance. Artificial Intelligence is also referred to as the ability of a system to correctly interpret external data [3].

Artificial Intelligence can creatively analyze visual elements and interpret the messages conveyed so that the narrative is consistent with the visual images created [4]. Artificial Intelligence, as a system developed through innovative research and modeled by machines and computers, can have intelligence equal to or greater than that of humans. This is due to adaptive capabilities, decision-making capabilities of artificial intelligence, cognitive abilities, and learning capabilities from artificial intelligence [5].

In the field of education, Artificial Intelligence refers to a system specifically designed to support and facilitate the teaching and learning process [6]. Common types of artificial intelligence applications include: Virtual Assistants, Autocorrect, Chat GPT, Virtual Reality (VR), Chat Bots, and AI Art Generators [7]. Artificial Intelligence also provides adaptive learning platforms tailored to the needs of individual students to enhance their understanding of specific topics or materials [8]. Artificial Intelligence elements combined with gamification have become increasingly popular learning platform applications. This is known as gamified AI. It can be said that gamified AI takes the concept of adaptive learning to a higher level by adding game elements that can increase student motivation and engagement. Adaptive learning platforms powered by Artificial Intelligence can be integrated with gamification mechanisms to provide more engaging learning experiences and help students learn more effectively and efficiently.

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Game-based learning is a learning method that uses game elements and game-like thinking in non-game environments to enhance student behavior and engagement in the learning process [9]. The idea of gamification essentially stems from the framework of gameplay [10]. Gamification is the use of game-based learning elements, techniques, and strategies to enhance learning by increasing engagement, fostering motivation, and supporting critical thinking skills [11]. Learning using gamification is currently considered a suitable learning tool [12]. Learning through gamification models is a learning medium that utilizes information and communication technology [13]. Gamification can be used both in the student learning process to increase motivation and interest in learning, as well as in student assessment to see the results of learning progress achieved [14]. Gamification is a learning strategy that applies game elements to non-game environments with the goal of engaging users and motivating them to solve problems [15]. Gamification of non-game systems is the activity of modeling the intended system to provide an engaging and addictive game atmosphere when users complete non-game tasks. Modeling can take the form of implementing game mechanics such as leaderboards to create a healthy competitive atmosphere among system users, points, levels, and badges that indicate mission accomplishment [16]. In line with this statement, the gamification model increases student interest because the games and learning packaged together increase student motivation and enthusiasm [17]. Through games, students can not only play but also learn, so they can make better use of their time [18]. It can be concluded that gamification is a technique that uses game elements, such as points, levels, and challenges, to increase engagement and motivation. In the context of education, gamified AI combines artificial intelligence with gamification principles to create learning experiences that are more interactive, engaging, and effective, thereby improving student learning outcomes.

The potential of game-based AI to improve student learning outcomes has become a focus of research in various fields. Using Artificial Intelligence, this system can tailor the learning experience to the needs and abilities of each individual, provide real-time feedback, and make learning more enjoyable through game elements. Although there has been a lot of research done on the application of gamified AI in various fields, its use in Islamic Religious Education (PAI) is still relatively limited. Islamic Religious Education, which encompasses religious teachings, morals, Islamic history, and religious concepts, is often seen as a difficult area to teach in an engaging and interactive way. PAI learning is generally based on traditional methods such as lectures and discussions, which may not be very effective in increasing student motivation and engagement, especially among younger generations who are more interested in technology and games. This is supported by research that states that children usually spend a lot of time playing [19]. In addition, children can become addicted to playing games and the time that children should use for learning is instead spent playing games [18]. Therefore, research needs to be conducted to find out how gamified AI can increase student motivation and engagement in PAI learning. The use of game elements specifically developed is expected to increase student interest and motivation to delve deeper into religious concepts that are often considered abstract or difficult to understand. In addition, because PAI lessons require a deep understanding of religious texts, history, and moral values contained in Islamic teachings, gamified AI can be more effective in helping students understand complex religious concepts.

This research aims to determine whether there is a difference in learning outcomes before and after using gamified AI, as well as whether there are specific elements in gamified AI, such as reward systems or challenge levels, that have the greatest impact on improving student learning outcomes and the impact of gamified AI on student learning outcomes in PAI subjects, especially the material of obligatory prayers. The main objective of this research is to find out how gamified AI can influence student learning motivation, and to find out the differences in learning between using gamified AI and conventional methods. In addition, this research also aims to identify aspects of gamified AI that have the greatest impact on improving student learning outcomes. The results of this research contribute to the development of more innovative and effective learning methods in the context of religious education and provide recommendations for developers and researchers interested in exploring the use of technology in PAI learning. Among interactive learning media, game-based learning media is one solution that provides added value, because games basically function as entertainment and by being made into learning media, it can make children more enjoyable in learning. Through games, students not only play but also learn at the same time, so time is more beneficial [18]. Because games are

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something that children like and learning through playing is the best way, especially if applied to elementary school children [20].

2 Literature Review

The utilization of technology in the world of education, especially in the context of Islamic Religious Education (PAI), is rapidly increasing. One innovation that has captured attention is the use of gamification and artificial intelligence (AI) in the learning process.

Gamification is a game-based learning concept [21]. The term gamification was first coined by Nick Pelling in 2002 when he presented at the TED (Technology, Entertainment, Design) event. Gamification is a learning approach that uses game or video game elements to enhance motivation, maximize enjoyment, and participation in the learning process. This media can then be used to capture what is engaging and inspiring for continuous learning [22]. In the world of education, gamification can also be defined as the process of transforming existing activities or learning activities and making the content like a game.

The basic idea of gamification is to increase the motivation of an activity [10]. Gamification also refers to the application of game components in other scientific fields (non-game) such as points, badges, leaderboards, and so on [23]. The terms gamification and game are often confusing because both use similar ideas and elements, but they are two different scientific concepts. Games are an approach to creating game applications that have specific friends and missions, while gamification is an approach that uses game elements to motivate and increase user engagement. In other words, gamification uses games to increase player motivation, making them excited and motivated to do something. Gamification can provide solutions in the field of learning by increasing learning motivation [10].

In relation to games, gamification can be described as a process where general concepts contained in games are integrated into human work in the real world, involving social interaction with real people [24]. Engaging game concepts can lead to continuous use of games or even addiction. Gamification has core game elements such as elements of levels, badges, rewards, points, and leaderboards in a non-game context to make mobile applications more attractive to increase the interest of consumers who use them [25].

Game developers have designed games that allow users to continue playing with various features such as challenges, bonuses, social interaction, with attractive animated graphics and music [26]. It would be even more beneficial if we could incorporate this into the world of education. Therefore, the use of games is considered to be an appropriate learning medium to engage and motivate students.

Educational games are digital games designed to expand knowledge (through the teaching and learning process), created using multimedia technology, and designed appropriately according to the desired educational standards [27]. There are several aspects of educational games that allow them to adapt to the times, especially in their creation, such as: First, Curiosity, Second, Challenge, Third, Fantasy, Fourth, Feedback, Fifth, Agency or Control, Sixth, Identity, Seventh, Immersion [28]. Through educational games, students are more motivated during learning, this is because the games contain educational content and have the goal of stimulating children's interest in learning to absorb learning materials while playing [29]. Therefore, the use of games as a learning medium is considered capable of making learning that was once monotonous more enjoyable. This can also lead to students being more motivated to learn so that students can understand the lessons that influence the quality of student learning outcomes.

The quality of learning outcomes can be understood as the level of achievement of the expected competencies after students undergo the learning process. This aspect covers three important dimensions, namely cognitive, affective, and psychomotor [30]. The determination of learning media has an impact on students' understanding of the material [31], including the lack of student interest, which affects the unsatisfactory learning outcomes [32]. Therefore, as previously stated, one alternative learning media that can overcome this problem is game-based learning media. One educational game used in PAI learning is the Marbel Prayer game. The Marbel educational game learning media allows students to be active in the classroom because of the fun learning and makes it easier to understand the material [33]. In line with this, to adjust the game content to the students' abilities and provide meaningful challenges and motivation in educational games, there needs to be an

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AI element used. This is because AI allows for a more personalized learning experience, where each student receives material that is appropriate to their skill level. Moreover, artificial intelligence has great potential in education, including in PAI. AI can be used to analyze students' learning needs and tailor learning materials to suit each student's learning styles and pace. Using AI, teachers can provide more accurate and timely feedback to students, as well as design more personalized learning experiences. This allows students to understand religious concepts better and more deeply.

As we know, AI technology has brought significant transformations in the field of education, introducing innovative ways to enhance learning and teaching experiences [34]. Experts have recognized the potential of artificial intelligence in education and emphasized its ability to provide inclusive and important feedback support to students, including high school students [35]. AI can quickly create highly complex visual works based on previously provided data and patterns [36]. Deep learning algorithms and artificial neural networks allow AI to learn from large datasets and create diverse designs with minimal human intervention [37]. With just inputting instructions, or questions, AI can generate diverse broadcasts, including answering questions, composing essays, and even creating artwork. Platforms and applications that use AI technology can simplify the process of creating works even without requiring special skills [7]. Thus, various other tasks can also be completed by students through various features and ease provided by AI. However, it must be remembered that these facilities must be used wisely by integrating artificial intelligence ethically and effectively in completing tasks [38]. In addition, it becomes very important for learners to be able to control the use of AI so as not to fall into the negative impacts that arise from the presence of artificial intelligence [39]. Studies show that the combination of gamification and AI in PAI learning can result in significant improvements in student learning outcomes. The use of gamification-based learning media allows students to actively engage and increase their interest in the learning material. In addition, research also notes that the use of interactive technology such as gamified applications can strengthen students' understanding of Islamic religious values through enjoyable learning experiences.

3 Research Method

The learning step begins by choosing materials that are in accordance with the learning objectives, such as movements or prayer readings. The teacher then guides students in understanding the material using the marble prayer game media as a form of AI gamification. After students understand the material, teachers can use the practice feature of questions or games in the media to evaluate the extent of students' understanding of the material being taught. The questions in the game media are designed in an interesting way so that students stay motivated to learn. The results of the exercise can be used as a reference to assess the level of understanding of students as well as increase their involvement in learning Islam. While several stages of the Marbel Prayer game used as PAI learning media, the prayer material is depicted in the following image;

Figure 2. Menu display

Several stages of the Marbel Shalat game are used as a learning medium for Islamic Education (PAI). The main menu display of this application can be seen in Figure 2 which displays the Start menu and other menu options.

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Figure 3. Menu display options

While the available prayer menu options are shown in Figure 3 where players can choose to learn about Adhan, Fajr Prayer, Dzuhur Prayer, Asr Prayer, Maghrib Prayer, and others.

Figure 4. Practice movements and recitations of prayer

To help students understand the movements and readings in prayer, the Marbel Shalat application provides a feature for practicing movements and prayer readings, as shown in Figure 4. In this feature, students can follow the sequence of prayer movements along with the readings presented in Arabic script, Latin script, and their meanings. This aims to make it easier for students to learn prayer interactively and enjoyably.

Figure 5. Game options

The game menu options in the Marbel Shalat application provide a variety of learning activities designed to increase student motivation, as seen in Figure 5. In this menu, students can choose various game categories, including movement practice, reading comprehension, and quizzes to test their knowledge.

Figure 6. Guessing the names of prayer movements

Each game menu is designed with gradual difficulty levels according to students' abilities. While students play, the application displays scores and game time to assess student performance in real-

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time, as shown in Figure 6. This feature provides direct feedback to students, allowing them to evaluate and improve their ability to understand prayer material.

The marble prayer game can be played at home to strengthen students' memory after receiving the subject matter from school, so that the results of the comparison of student learning scores before or after applying the game media will be obtained.

This research employs a quantitative research design with a descriptive-analytic and experimental approach, specifically utilizing the One-Group Pretest-Posttest Design. This approach was chosen to analyze the impact of a simple Gamified AI, namely the "Marbel Shalat" game, on the learning outcomes of second-grade students at SDIT Tahfizh Daarul Huda Sariak Laweh and SDIT Al-Kautsar Bukittinggi in the subject of Islamic Religious Education (PAI), focusing on the material of obligatory prayers (shalat fardhu). The data used in this research is quantitative, obtained through initial observations and interviews. This was conducted to identify existing problems in the field. An initial test (pre-test) was then administered to determine the students' scores while learning using traditional methods. Subsequently, a final test (post-test) was conducted to measure the improvement in student scores after the intervention. Finally, a questionnaire was distributed to both students and teachers to gather feedback on the use of the "Marbel" game.

The research instruments used include interview indicators, the "Marbel Shalat" game, pre-test and post-test question sheets, and a questionnaire. Data collected from the tests and questionnaires will be analyzed using descriptive and inferential statistics to test the hypothesis, including comparing the pre-test and post-test results using a paired t-test. The research procedure can be illustrated in the following diagram:

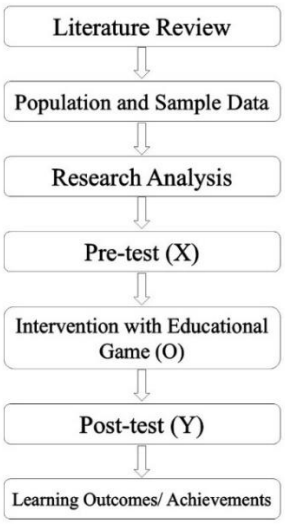

Figure 1. Research procedure

Figure 1 depicts the stages involved in the research process. The initial stage involves a literature review, where the researcher refers to reference sources to support the initial observation stage. Population and sample data are then collected through photographs of activities conducted in the classroom and other locations as part of the students' learning process. The next step is research analysis. The available data is analyzed, followed by an initial test or pre-test. After obtaining the results of the initial test, the students are given an intervention in the form of implementing educational games as a learning medium. Subsequently, a final test or post-test is conducted to determine the students' learning outcomes from using educational game media in PAI lessons.

4 Results and Analysis

The data collected in the classroom was then processed to determine the success of the research. The sample taken in this research consisted of two classes, namely class II with 14 students at SDIT Tahfizh Daarul Huda Sariak Laweh and 22 students at SDIT Al-Kautsar Bukittinggi. In an effort to gather data on the influence of using the Marbel game-based learning media, pre-tests and post-tests were given to the 14 students in class II of SDIT Tahfizh Daarul Huda Sariak Laweh and 22 students in class II of SDIT Al-Kautsar Bukittinggi. After the data tabulation process, the scores before

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implementing the media, referred to as pre-test (X), and the scores after implementing the media, referred to as post-test (Y), were obtained. In the process, the first meeting on September 26, 2024, involved a pre-test to assess the initial knowledge of the students of SDIT Tahfizh Daarul Huda Sariak Laweh and on January 6, 2025, a pre-test will be carried out to find out the initial knowledge possessed by SDIT Al-Kautsar Bukittinggi students by providing a set of questions, followed by a presentation of the material. The results of the pre-test scores can be seen in Table 1.

Table 1. Pre-test scores

Respondent Code	Pre-Test Scores	PG	Description
TDH1	70	75	Not Completed
TDH2	40	75	Not Completed
TDH3	60	75	Not Completed
TDH4	80	75	Completed
TDH5	70	75	Not Completed
TDH6	70	75	Not Completed
TDH7	70	75	Not Completed
TDH8	65	75	Not Completed
TDH9	50	75	Not Completed
TDH10	50	75	Not Completed
TDH11	75	75	Completed
TDH12	79	75	Completed
TDH13	75	75	Completed
TDH14	73	75	Not Completed
AKB15	72	75	Not Completed
AKB16	82	75	Completed
AKB17	85	75	Completed
AKB18	80	75	Completed
AKB19	50	75	Not Completed
AKB20	83	75	Completed
AKB21	78	75	Completed
AKB22	65	75	Not Completed
AKB23	83	75	Completed
AKB24	72	75	Not Completed
AKB25	66	75	Not Completed
AKB26	85	75	Completed
AKB27	70	75	Not Completed
AKB28	73	75	Not Completed
AKB29	71	75	Not Completed
AKB30	80	75	Completed
AKB31	85	75	Completed
AKB32	65	75	Not Completed
AKB33	90	75	Completed
AKB34	65	75	Not Completed
AKB35	60	75	Not Completed
AKB36	77	75	Completed
Total	**2564**		
Average	**71,22**		
Completed			**15 (41,67%)**
Not Completed			**21 (58,33%)**

The table above shows that only 15 students achieved mastery in their learning, representing 41.67%, while 21 students did not achieve mastery, representing 58.33%. This indicates that a significant number of students scored below the Minimum Mastery Criteria (KKM) for the PAI subject, which is 75. This is attributed to the fact that most students have not yet mastered the material on obligatory prayers and have not reviewed the subject at home due to a lack of engaging learning

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media that can stimulate their motivation. Subsequently, a post-test was conducted on January 20, 2025, during the second meeting. Before administering the questions, students were engaged in gamified AI activities and guided by their parents at home to learn independently through the Marbel Shalat game as a learning medium. Four months later, the post-test was administered for SDIT Tahfizh Daarul Huda students and 2 weeks later for SDIT Al-Kautsar Bukittinggi. So that the total application of the intensive prayer marble game media for SDIT Tahfizh Daarul Huda is one month and 2 weeks for SDIT Al-Kautsar Bukittinggi. The media is used regularly every day where students learn through marble game media at home for approximately 2 hours every day after finishing the Isha prayer and 1 hour at school during the afternoon learning evaluation. The post-test scores are presented in Table 2.

Table 2. Post-test scores

Respondent Code	Post-Test Scores	PG	Description
TDH1	88	75	Completed
TDH2	73	75	Not Completed
TDH3	79	75	Completed
TDH4	90	75	Completed
TDH5	84	75	Completed
TDH6	85	75	Completed
TDH7	87	75	Completed
TDH8	77	75	Completed
TDH9	82	75	Completed
TDH10	75	75	Completed
TDH11	94	75	Completed
TDH12	95	75	Completed
TDH13	90	75	Completed
TDH14	87	75	Completed
AKB15	85	75	Completed
AKB16	96	75	Completed
AKB17	95	75	Completed
AKB18	95	75	Completed
AKB19	69	75	Not Completed
AKB20	92	75	Completed
AKB21	85	75	Completed
AKB22	77	75	Completed
AKB23	90	75	Completed
AKB24	86	75	Completed
AKB25	79	75	Completed
AKB26	94	75	Completed
AKB27	84	75	Completed
AKB28	88	75	Completed
AKB29	88	75	Completed
AKB30	89	75	Completed
AKB31	96	75	Completed
AKB32	76	75	Completed
AKB33	95	75	Completed
AKB34	75	75	Completed
AKB35	73	75	Not Completed
AKB36	82	75	Completed
Total	**3075**		
Average	**85,41**		
Completed			**33 (91,67%)**
Not Completed			**3 (8,33%)**

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The table reveals that 33 students achieved mastery in their learning, representing 91.67%, while 3 students did not achieve mastery, representing 8.33%. Comparing this to the average pre-test scores before using gamified AI, guided by parents at home for independent learning through the Marbel Shalat game as a learning medium, the average post-test scores are higher, with a 50% increase in mastery rate. This signifies an improvement in student learning outcomes in the PAI subject, specifically on the material of obligatory prayers, at SDIT Tahfizh Daarul Huda Sariak Laweh and SDIT Al-Kautsar Bukittinggi. The study employed pre-requisite tests, including instrument testing and reliability testing. The validity test of the questions in this research was conducted using Microsoft Excel 2013. The validity test used by the researcher was the product moment correlation formula (r_{xy}). Based on the product moment correlation calculation with a significance level of 0.05 and df = n-2 (36-2 = 34), the r_{table} index was 0.329. Based on the results of the validity test calculation for the 20 questions that were trialled and consulted with the r_{table} value, all of them were found to be valid. This aligns with the criteria that if $r_{calculated} > r_{table}$, then the data is considered valid. Based on the reliability calculation for the 20 questions using the *KR*-20 formula, the results were *ri* = 0.829 for the pre-test and *ri* = 0.869 for the post-test. Based on the decision-making criteria that if value of *ri* > 0.7, then the questions are considered reliable, and conversely, if value of *ri* < 0.7, then the questions are considered unreliable. Therefore, the results of the calculation, namely *ri* = 0.829 > 0.7 for the pre-test and *ri* = 0.869 > 0.7 for the post-test, demonstrate that both the pre-test and post-test question items are reliable.

Table 3. The normality test results tests of normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.151	36	.036	.940	36	.051
Posttest	.093	36	.200*	.946	36	.081

***. This is a lower bound of the true significance.**
a. Lilliefors Significance Correction

Based on Table 3, it can be determined that the results of the normality test of the data using the Shapiro-Wilk formula show that the pre-test data has a sig value of 0.051, and the post-test data has a sig value of 0.081. According to the decision-making criteria in the Shapiro-Wilk normality test, if the sig value > 0.05, then the data is considered normal; conversely, if sig < 0.05, then the data is not normal. Based on the results of the calculation, the pre-test = 0.051, which means > 0.05, and the post-test 0.081, which means > 0.05, it can be concluded that the data is normally distributed. From the calculation, it is known that the value of $F_{calculated}$ = 1.046, and the F_{table} value at a significance level of 0.05 and df = n-1 (36-1=35) is F_{table} = 1.842. According to the decision-making criteria, if $F_{calculated} < F_{table}$, then the data is considered homogeneous; conversely, if $F_{calculated} > F_{table}$, then the data is not homogeneous. Based on the results obtained, 1.046 < 1.842, which means $F_{calculated} < F_{table}$, therefore the data is homogeneous.

1. Product Moment Correlation Test

The Product Moment Correlation test, or correlation analysis, seeks to determine the relationship between the pre-test (X) and post-test (Y) learning outcome variables when the data is in interval or ratio form. Before performing the calculations using the Product Moment Correlation formula, a working table should be created to facilitate data processing, as shown in Table 3.

Table 4. Correlation coefficient conventional learning outcomes (x) and learning outcomes with marbel shalat game media (y)

Respondent Code	X	Y	X^2	Y^2	XY
TDH1	70	88	4900	7744	6160
TDH2	40	73	1600	5329	2920
TDH3	60	79	3600	6241	4740
TDH4	80	90	6400	8100	7200
TDH5	70	84	4900	7056	5880
TDH6	70	85	4900	7225	5950
TDH7	70	87	4900	7569	6090
TDH8	65	77	4225	5929	5005

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TDH9	50	82	2500	6724	4100
TDH10	50	75	2500	5625	3750
TDH11	75	94	5625	8836	7050
TDH12	79	95	6241	9025	7505
TDH13	75	90	5625	8100	6750
TDH14	73	87	5329	7569	6351
AKB15	72	85	5184	7225	6120
AKB16	82	96	6724	9216	7872
AKB17	85	95	7225	9025	8075
AKB18	80	95	6400	9025	7600
AKB19	50	69	2500	4761	3450
AKB20	83	92	6889	8464	7636
AKB21	78	85	6084	7225	6630
AKB22	65	77	4225	5929	5005
AKB23	83	90	6889	8100	7470
AKB24	72	86	5184	7396	6192
AKB25	66	79	4356	6241	5214
AKB26	85	94	7225	8836	7990
AKB27	70	84	4900	7056	5880
AKB28	73	88	5329	7744	6424
AKB29	71	88	5041	7744	6248
AKB30	80	89	6400	7921	7120
AKB31	85	96	7225	9216	8160
AKB32	65	76	4225	5776	4940
AKB33	90	95	8100	9025	8550
AKB34	65	75	4225	5625	4875
AKB35	60	73	3600	5329	4380
AKB36	77	82	5929	6724	6314
Total	**2564**	**3075**	**187104**	**264675**	**221596**

By looking at table 4, it can be seen that :

$\sum X$: 2564 $\sum Y^2$: 264675
$\sum Y$: 3075 $\sum XY$: 221596
$\sum X^2$: 187104 $\sum N$: 36

After the working table of the correlation coefficients of the X variable and the Y variable is known, the data is entered into the Product Moment correlation formula (1), then the data is entered into the formula (with equation (2)), then the numerator and denominator calculation steps (with equations (3), (4) and (5)), so that the result (6), and the final value of r_{xy} (7) are obtained with the following description:

$$r_{xy} = \frac{N\sum xy-(\sum x)(\sum y)}{\sqrt{\{N\sum x^2-(\sum x)^2\}\{N\sum y^2-(\sum y)^2\}}} \quad (1)$$

$$r_{xy} = \frac{36(221596)-(2564)(3075)}{\sqrt{\{36(187104)-(2564)^2\}\{36(264675)-(3075)^2\}}} \quad (2)$$

$$r_{xy} = \frac{7977456-7884300}{\sqrt{\{6735744-6574096\}\{9528300-9455625\}}} \quad (3)$$

$$r_{xy} = \frac{93156}{\sqrt{(161648)(72675)}} \quad (4)$$

$$r_{xy} = \frac{93156}{\sqrt{11747768400}} \quad (5)$$

$$r_{xy} = \frac{93156}{108387,12} \quad (6)$$

$$r_{xy} = 0,8596 \; rounded\ up\ to\ 0,860 \quad (7)$$

Based on the calculations above, the correlation coefficient between variable X and variable Y is 0.860. This indicates that using the Marbel Shalat game as a learning medium has an impact on student learning outcomes. To determine whether the calculated correlation coefficient is significant, it needs to be compared with the r_{table} value. The r_{table} value with degrees of freedom (df) = n-2 (36-2 =

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34) at a 5% significance level is 0.329. Comparing this with the $r_{calculated}$ value, it is found that the $r_{calculated}$ value is greater than the r_{table} value. Therefore, $r_{calculated} > r_{table}$ (0.860 > 0.329), leading to the rejection of the null hypothesis (H_o) and acceptance of the alternative hypothesis (H_a). This concludes that there is a positive influence of the Marbel Shalat game as a learning medium on students' learning outcomes. According to the product moment interpretation table, the obtained "r" value of 0.860 falls between 0.60-0.899, indicating a very strong correlation (very high effectiveness). In conclusion, there is a strong relationship between the Marbel Shalat game as a learning medium and students' learning outcomes in the PAI subject, specifically on the mandatory prayer material.

2. Significance Test

Following the correlation test, a significance test (t-test) is necessary to determine whether the independent variable has a significant influence on the dependent variable individually, with a 95% confidence level and a 5% or 0.05 error rate. The results of the t-test are as follows:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \quad (8)$$

$$t = \frac{0{,}860\sqrt{36-2}}{\sqrt{1-(0{,}860)^2}} \quad (9)$$

$$t = \frac{0{,}860\sqrt{34}}{\sqrt{1-0{,}740}} \quad (10)$$

$$t = \frac{0{,}860 \times 5{,}83}{\sqrt{0{,}260}} \quad (11)$$

$$t = \frac{5{,}0138}{0.5099} \quad (12)$$

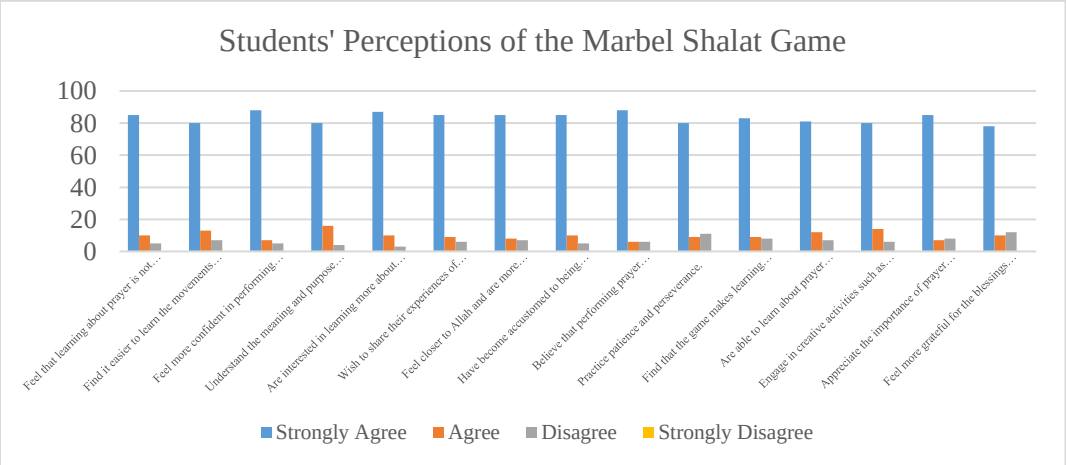
$$t = 9{,}83 \quad (13)$$

Dari The calculations reveal that the calculated t_{value} ($t_{calculated}$) is 9.83. To determine its significance, we need to compare it with the t_{table} value. For a 5% error rate (0.05) and degrees of freedom (df) = n-2 (36-2 = 34), the t_{table} value is 2.032. It can be concluded that the correlation coefficient between the Marbel Shalat game as a learning medium and the learning outcomes in PAI regarding mandatory prayer is significant, meaning that this coefficient can be applied to the population from which the sample of 36 respondents was taken.

Since $t_{calculated} > t_{table}$, the null hypothesis ($H_o$) is rejected, and the alternative hypothesis (H_a) is accepted. This indicates a difference in the learning outcomes of students in the PAI subject regarding mandatory prayer before and after the implementation of the Marbel Shalat game as a learning medium. Therefore, it can be confidently stated that the Marbel Shalat game, as a learning medium, has demonstrated its effectiveness and has a significant impact on improving the learning outcomes of second-grade students in the PAI subject, specifically on the mandatory prayer material, at SDIT Tahfizh Daarul Huda Sariak Laweh and SDIT Al-Kautsar Bukittinggi after the subject test was conducted, resulting in a significant increase in scores.

This is in line with the results of the questionnaire obtained after implementing the Marbel Prayer game as a learning medium, the results can be seen in the following graph:

Chart 1. Students' perceptions of the marbel shalat game as a learning media for islamic religious education (n=36)



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Based on the results of a questionnaire on 36 students, it can be concluded that the application of the Marbel Prayer game as a medium for teaching Islamic Religious Education received a positive response in general. The majority of students, namely 30 students out of 36 students, or 83.33%, stated that they strongly agreed that the use of Marbel Prayer attracted their attention and increased participation in learning prayer. This shows that the Marbel Prayer game is considered an effective learning medium in helping students understand prayer procedures, prayers, and movements.

Combining gamification with parental involvement and utilizing a digital media-based approach like Artificial Intelligence, which is enjoyable and interactive, for PAI lessons, often perceived as difficult, makes this research more advanced compared to other studies. Furthermore, the use of comprehensive statistical methods and meaningful results strengthen the validity and reliability of this research, providing a significant contribution to improving student learning outcomes in PAI, particularly regarding the mandatory prayer material.

5 Conclusion

The results of this study show that the application of the AI game "Marbel Shalat" combined with gamification significantly improves the learning outcomes of second grade students of SDIT Tahfizh Daarul Huda Sariak Laweh and SDIT Al-Kautsar Bukittinggi in the subject of Islamic Religious Education, especially regarding mandatory prayers. The application of simple gamified AI, namely the marble prayer game as a PAI learning medium, prayer material is well received by students because it is able to provide attraction, trigger enthusiasm and motivation in the learning process. This is evidenced by the increase in mastery from 41.67% to 91.67% which shows the effectiveness of using interesting and interactive learning media. In addition, strong correlations and significant t-test results further validated the positive impact of the intervention. This research underscores the importance of integrating gamification learning strategies in educational settings, as it can increase student motivation and engagement, ultimately leading to better academic performance. These findings form the basis for future research exploring the use of gamification in a variety of educational contexts, especially in subjects that students may find challenging.

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