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Qur'an Whiz: Developing an Android-Based Application to Enhance Qur'an Memorization Skills for Elementary School Students

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Abstract: Post-COVID-19, Islamic religious education faced challenges due to mosque restrictions and suspended Qur'anic programs, reducing youth interest in memorization. Technological distractions also prompted shifts in teaching methods to adapt to digital advancements. This study aims to develop the Qur'an Whiz educational game application for Qur'anic memorization using the *Takrir* method, designed specifically for the Android platform. The research adopted the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) as its methodological framework. Iterative testing and validation processes involving material, design, and media experts were conducted to refine the application and ensure its effectiveness and user engagement. The activities carried out at the analysis stage are collecting data through interviews and observations, related to existing problems. Furthermore, implementation is carried out by testing the application in the community, students, material experts, design experts, and media experts. After testing and implementing the product, the final stage is evaluating and perfecting the "Qwizy" application according to suggestions from experts, teachers, students, and the general public. The findings revealed a significant improvement in users' memorization abilities, with the average pretest score of 65 increasing to 85 in the post-test, reflecting a 20-point or 30.77% improvement. The application features a user-friendly interface and interactive elements that enhance user motivation and engagement. This study concludes that "Qur'an Whiz" is an innovative and effective tool for improving Qur'anic memorization, offering an educational and enjoyable learning experience for children in the digital era.
Keywords: Qur'an memorization, educational game, *takrir* method, android application, gamification

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Introduction

Memorizing the Qur'an holds a significant position in Islamic education. In addition to serving as a means to attain spiritual benefits, this practice plays a crucial role in developing a Muslim's intellectual and moral qualities. According to Islamic teachings, memorizing the Qur'an is believed to intercede for the memorizer on the Day of Judgment, a concept emphasized in various hadiths of Prophet Muhammad Saw.. As a *fardhu kifayah* (collective obligation), memorizing the Qur'an is considered a communal duty, meaning that if some community members fulfill this responsibility, it relieves others from this obligation (Silvina, 2021). However, despite the widespread acceptance of the significance of Qur'anic memorization, this practice faces various challenges, particularly in the context of rapid social and technological changes in the digital age. In recent years, there has been a significant decline in the interest of the younger generation in memorizing the Qur'an. One of the main contributing factors is the restriction of mosque activities due to the COVID-19 pandemic, which disrupted Qur'anic study programs. In addition, distractions from technology and changes in lifestyle have further diminished the

younger generation's focus on religious activities (Yosepha, 2021). These changes highlight the need for innovative approaches to engage the younger generation in Qur'anic education. One potential solution is using digital technology, which is already deeply integrated into daily life, particularly in the form of mobile game-based applications that can enhance engagement and motivation in Qur'anic memorization.

Although several mobile applications have been developed to assist children in memorizing the Qur'an, many are still limited to traditional approaches and fail to integrate interactive elements that could enhance student engagement (Mustofa, 2021). Most existing applications overlook the importance of traditional memorization methods, such as the *Takrir* method, which involves repetition to reinforce memorization. Therefore, this study aims to address this gap by developing a mobile game-based application that combines the *Takrir* method with interactive features that are both enjoyable and effective. By adopting this approach, the study seeks to demonstrate how technology can enrich the learning experience while preserving the traditional educational values in Islam. Previous studies have highlighted the growing interest in using technology in Qur'anic education. However, a gap in research that effectively combines technology with traditional methods remains. Some studies, such as Wibawanto & Nugrahani (2018), emphasize the potential of educational games to increase learning interest, while others, like Boyle (2006), discuss the importance of discipline in memorizing the Qur'an through pesantren. However, there is limited research specifically exploring mobile games that integrate the *Takrir* method to motivate the younger generation to memorize the Qur'an. This research addresses this gap by providing a new approach that combines technology with established Islamic educational principles.

In the literature review, this study references various relevant sources on Qur'anic memorization and the use of technology in education. A study by Nur (2018) explains how memorizing the Qur'an can enhance cognitive skills, while Silvina (2021) demonstrates that the *Takrir* method, which involves repetitive review, is highly effective in improving memory retention and understanding. Wibawanto & Nugrahani (2018) also emphasize the importance of using games in education, stating that educational games can increase student interest and engagement. However, despite the growing recognition of the importance of technology in education, there is still limited research suggesting the application of Android-based games to support the *Takrir* method in Qur'anic memorization. This study aims to design and develop the mobile application "Qwhizy," an Android-based educational game that integrates the *Takrir* method to assist students in memorizing the Qur'an. The primary objectives of this research are: (1) to design the Qwhizy application to help children memorize the Qur'an in an enjoyable and effective manner, (2) to evaluate the effectiveness of the Qwhizy application in improving Qur'anic memorization skills among elementary school students, and (3) to examine the contribution of this application to the intellectual development and critical thinking skills of students.

The contribution of this research to education in Indonesia is significant, as this application not only integrates modern technology with Islamic education but also introduces a novel approach to Qur'anic memorization that aligns with the preferences of the digital-native younger generation. This research offers a solution to enhance student engagement in Islamic education, particularly in memorizing the Qur'an, in an engaging and interactive way. Therefore, this study has the potential to transform the teaching and learning of the Qur'an in Indonesia, making it more relevant to the demands of the digital age and the needs of contemporary students.

The hadith of Prophet Muhammad Saw. explains that memorizing the Qur'an will be an intercess. Memorizing the Qur'an holds a significant place in Islamic education, as it is a means to gain spiritual benefits and a key to developing intellectual and moral qualities. According to the teachings of Prophet Muhammad Saw. memorizing the Qur'an serves as an intercessor on the Day of Judgment, emphasizing its importance in Islamic life. Scholars agree that memorizing the Qur'an is a *fardhu kifayah* (a collective obligation), which means if some community members fulfill this responsibility, it relieves others from this duty (Silvina, 2021). In both formal education, such as in schools, and non-formal settings, like pesantren (Islamic boarding schools), Qur'anic memorization is considered the first step in an educational process that fosters intellect, discipline, and spirituality while providing a deeper understanding of both God and life (Boyle, 2006).

However, some scholars argue memorization is often seen as a passive activity that does not promote critical thinking or intellectual development. On the contrary, others assert that memorizing the Qur'an engages the mind, sharpens concentration, and strengthens intellectual abilities, helping students

retain the text and deeply understand and apply it in their lives (Nur, 2018). As we move further into the digital age, the widespread use of technology, especially smartphones, has opened new opportunities for education, including in Qur'anic memorization. Indonesia, for example, has become one of the highest users of smartphones globally, with approximately 170.4 million users, accounting for 61.7% of the population (Yosepha, 2021). This widespread use of mobile technology has led to the rapid growth of mobile games, which, despite their entertainment value, often divert children and adolescents from productive academic and religious activities. The COVID-19 pandemic, in particular, has further exacerbated the dependence on mobile gaming among young people, shifting their focus away from meaningful learning activities, including memorizing the Qur'an.

Despite concerns about the negative effects of mobile games, there is potential for using games as a tool for educational engagement. Educational games can foster interest in learning by creating enjoyable experiences that make absorbing and retaining information easier (Wibawanto & Nugrahani, 2018). Recognizing this opportunity, this study proposes the development of an Android-based educational game called Qur'an Whiz: Application Game Android-Based Hafidz Al-Qur'an Education Using the *Takrir* method, branded as Qwhizy. This mobile game will integrate the *Takrir* method, which involves repeated review, with interactive game mechanics to engage students in memorizing the Qur'an in a fun and effective manner.

Despite the growing number of mobile applications aimed at helping children memorize the Qur'an, many of these applications lack engaging features and fail to combine traditional memorization methods with modern technology effectively. This study aims to fill this gap by designing an interactive mobile game that blends the best of both worlds: traditional memorization techniques and modern digital gaming. While there have been some efforts to incorporate technology into Islamic education, the potential of combining mobile games with memorization methods like *Takrir* has not been extensively explored. By addressing this research gap, this study provides an innovative approach to Qur'anic education, offering a model for how educational games can be integrated into Islamic learning.

The objectives of this research are to design and develop the Qwhizy application, evaluate its effectiveness in enhancing memorization skills among elementary school students, assess students' attitudes toward using mobile games for Qur'anic memorization, and examine how the application can contribute to intellectual development and critical thinking skills. The contribution of this research to education in Indonesia is significant, as it combines modern technology with Islamic education, offering a solution that enhances students' engagement with Qur'anic memorization while aligning with the tech-savvy nature of today's youth. The results of this research have the potential to influence how Qur'anic memorization is approached in schools and Islamic educational institutions, making the learning process more engaging, enjoyable, and effective for students.

Methods

This research was Research and Development (R&D) type research. The research procedures refer to the ADDIE model, which consists of five steps: analyze, design, development, implementation, and evaluation (Trisiana & Wartoyo, 2016; Uno & Ma'ruf, 2016). The ADDIE development model has the advantage that it always goes through an evaluation stage at all stages first so that it can minimize errors or shortcomings, no matter how small, from the start (Dwiqi et al., 2020). The flow of applying the ADDIE method is shown in Figure 1. The following is the procedure applied in developing the Qwhizy application.

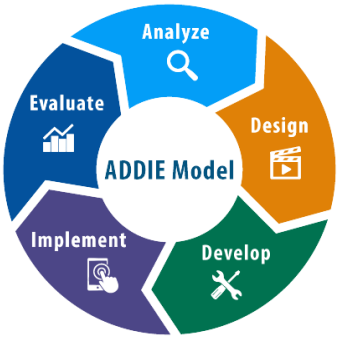

Figure 1. Qwhizy Application ADDIE Procedure Chart

The research subjects in developing this application are children aged 9-25 who can operate cell phones. Learning media development goes through several tests by material experts, design experts and media experts. This is to ensure the suitability of the application before testing in community and public environments. The research was carried out in July-September 2023 at the Nurul Islam Glagah Ombo Mosque, the Mujahidin Mosque Depok 2 Vocational High School, the Yogyakarta State University Islamic Spiritual Activity Unit, and the At-Taqwa Pancoh Kulon Mosque.

The activities carried out at the analysis stage are collecting data through interviews and observations, related to existing problems. In this way, researchers can determine the features developed in learning media according to user needs. In addition, researchers distributed questionnaires to teachers and students regarding the learning media that was being developed. The questionnaire contains information about material, design, and media suitability (Istiqomah & Wibowo, 2024; Elindasari et al., 2024). The design stage is carried out by designing learning media through use cases, flowcharts, class diagrams, and interface design for the application. Qur'an Whiz, which will be developed. The development stage is done by realizing applications created using Visual Studio Code with the Dart programming language. The language aspect is very important to pay attention to in developing learning media (Mustadi dkk., 2023; Wibowo, S. E., 2024). This aims to develop applications on the Android platform. Furthermore, implementation is carried out by testing the application in the community, students, material experts, design experts, and media experts. After testing and implementing the product, the final stage is evaluating and perfecting the "Qwizy" application according to suggestions from experts, teachers, students, and the general public. Data from the general public, students, material experts, design experts, and media experts was analyzed to measure and validate the developed application. Measurements are carried out using the following formula.

Table 1. Validation of Analytical Instruments Scoring

Answer Choices	Score
Very good	5
Good	4
Enough	3
Not enough	2
Very less	1

The grades are one to five for very good, good, fair, poor, and very poor answers. The interval data can be analyzed by calculating the average of the answers based on *scoring* every answer from an expert.

$$Answer\ Percentage\ = \frac{Total\ Score - Minimum\ Score}{Maximum\ Score - Minimum\ Score}\ \text{x}\ 100\%$$

Next, the eligibility percentage obtained is then interpreted into eligibility categories based on Table 2.

Table 2. Eligibility Criteria

Percentage Score (%)	Interpretation
0% - 20%	Not really worth it
21% - 40%	Less worthy
41% - 60%	Enough
61% - 80%	Worth it
81% - 100%	Very worthy

Results and Discussion

Results

The research and development (R&D) process is important in creating effective and innovative applications. In application development Qur'an Whiz aimed at children with dyslexia, we carried out a series of R&D stages, including user needs analysis, design, testing, and evaluation. Each step is designed to ensure that the application is interesting and interactive and provides maximum benefits in

the child's learning process. The following is a flowchart design, use case, and class diagram for the Qwizy application.

1. Analysis

   The analysis aims to identify problems that occur in society, the needs needed for system design, and activities that can be completed with applications in learning to memorize the Al-Qur'an. Researchers identify problems by conducting surveys and collecting data needed to create applications. Interviews and observations were conducted in July-September 2023 at the Nurul Islam Glagahombo Mosque, the Mujahidin Mosque Depok 2 Vocational High School, the Yogyakarta State University Islamic Spiritual Activity Unit, and the At-Taqwa Pancoh Kulon Mosque.

   The results of identifying problems in students show difficulties in learning and memorizing the Qur'an in terms of tajwid law, the spirit of memorization, and effective memorization methods. Data collection is taken from the santri process in an effort to maintain quality and quantity in memorizing the Qur'an. From the collection of data, students and undergraduates show interest and enthusiasm in learning to memorize the Al-Quran, which tends to decrease. The next data collection is to find a good, correct, and effective method in supporting each santri to memorize and learn the Qur'an.

2. Design

   The design stage aims to plan strategies for memorizing the Al-Qur'an and selecting learning models. This stage also includes creating a flowchart to organize data processes in the system to facilitate application development. The final result of the design stage is a plan or design that is able to answer problems from the previous analysis process and has a plan related to the learning experience that will be obtained by application users in the future (Harjanta & Herlambang, 2018).

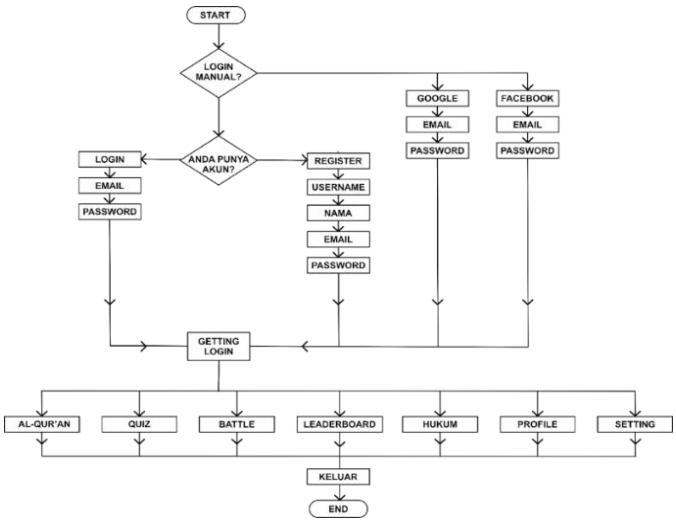

Figure 2. Flowchart Qwhizy App

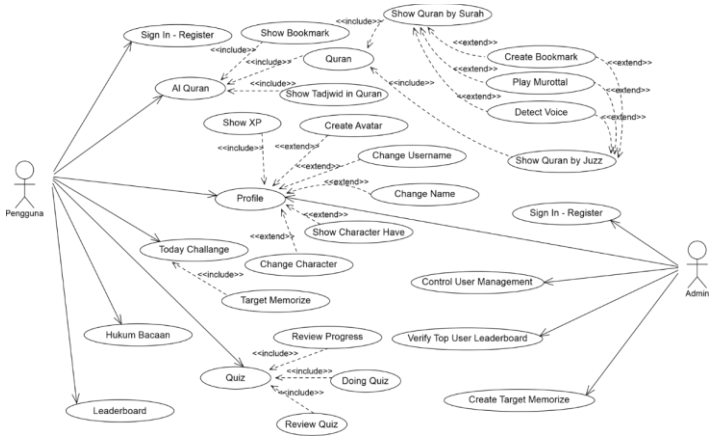

Figure 3. Use Case Qwhizy Application Diagram

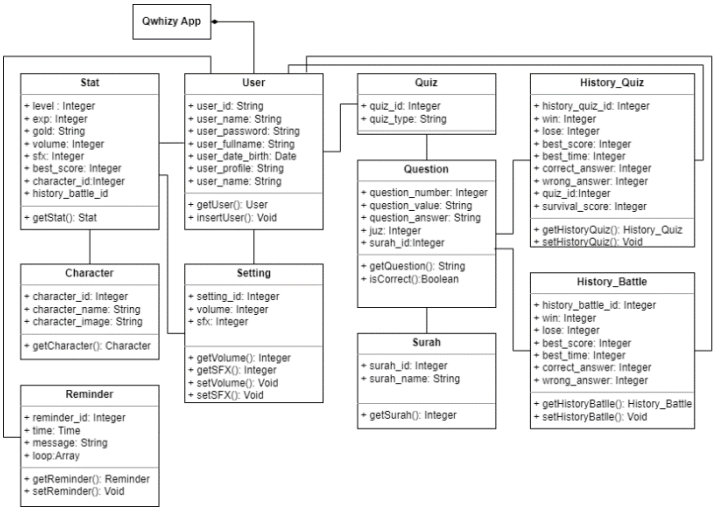

Figure 4. Qwhizy Application Class Diagram

At the Qwhizy application's design stage, we focused on creating a fun and effective learning experience for children aged 5 years and over. In this process, we consider various aspects, such as an intuitive user interface, interesting interactive features, and educational content that suits user needs. With a user-oriented design approach, we hope to produce an application that makes learning to read the Qur'an easier and increases children's motivation and engagement. For more details, the following is a prototype design of the Qwhizy application.

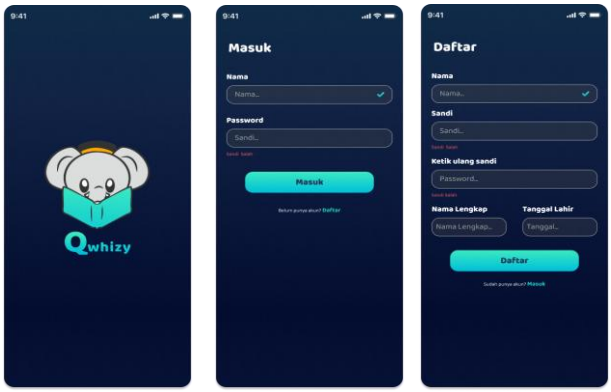

Figure 5. Splash Screen, Page Login, Page Sign Up

a. After login user or user will automatically focus on the display dashboard. The user can enjoy A main menu, namely the Qur'an, today's challenge, quiz, battle *hafidz*, leaderboard, and the law of reading.

Figure 6. Dashboard, Today Challenge, Quiz, Leaderboard

b. In the Al-Qur'an menu, users can read the Al-Qur'an. The Al-Qur'an in this application has been adapted to digital Qur'an standards with an attractive design, neat khat writing, equipped with colored tajwid, which makes it easier to read the Al-Qur'an, for example, *murottal* from *Ustadz*, as well as reading verses.

Figure 7. Al-Qur'an, Qur'an, Bookmark

c. On the menu quiz, users can work on it quiz which is already provided. Quiz It contains verses from the Qur'an, this aims to support the enthusiasm of students to memorize the Qur'an. On quiz This is adapted to hafiz standards for connecting verses, guessing verses of the Qur'an, up to the challenge of reading the Qur'an.

Figure 8. Level Quiz, Results Quiz, Questions Quiz

d. On the menu Battle *Hafiz*, users can do battle with material on memorizing the Qur'an. This is adjusted to *Hafiz*'s standards for connecting verses, guessing verses from the Qur'an, and even challenges reading the Qur'an. *Hafiz* and *hafizah* can choose the highest score mode or quiz mode (which answers questions the fastest with the most scores).

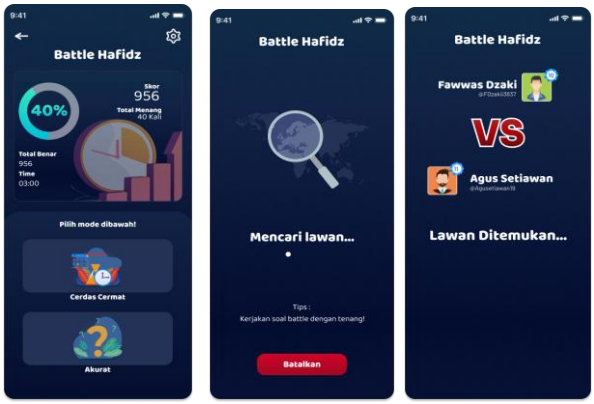

Figure 9. Menu Battle *Hafidz*, Finding Enemies, Matching

e. On the menu today challenge, the user can solve challenges provided by the system every day. This menu is used to provide new methods every day. Challenges can be connecting verses, reciting verses, justifying recitations, guessing verses, and many more.

Figure 10. Challenges Menu, Level Menu, and Reading Law Menu

f. Users can view application guidelines and terms, application info, language changes, and notifications on the menu setting. Apart from that, users can also change their password account and log out of the account.

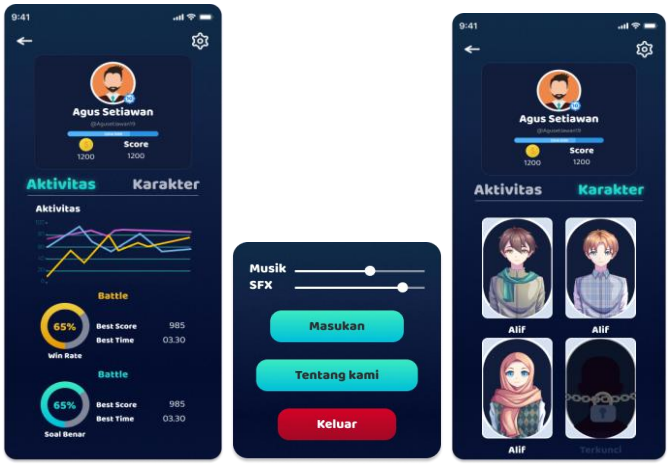

Figure 11. Statistics Menu, Setting, Character

3. Develop

The coding stage is the next step in implementing supporting technology for application development. At this stage, the User Interface (UI) design is translated into a real functioning application. The coding process was carried out using the Flutter framework and the Dart programming language. Flutter was chosen because of its ability to build applications that can run on both platforms, namely iOS and Android. Coding is carried out using the Visual Studio Code text editor, while for the debugging process, an emulator from Android Studio (online) and a smartphone device (directly) are used. The Qwhizy application can be debugged via an emulator, browser, or smartphone. The smartphone device used to run the application must have at least the Android 9 (Pie) operating system. The application running and debugging process aims to test the application directly and ensure the application runs well. The following is documentation related to making this application.

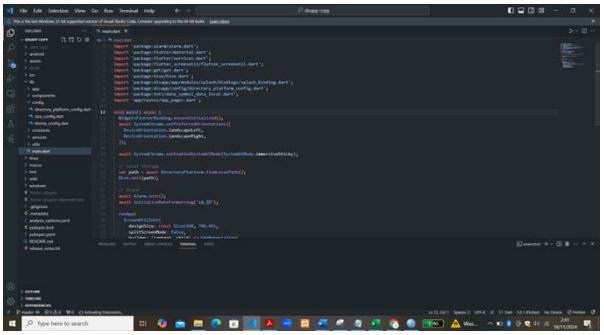

Figure 12. Application Development Stage

4. Implement

The Qwhizy application was successfully implemented using framework flutter uses the Ministry of Religion's Al-Qur'an REST API integration. The results of implementing the Qwhizy application show an increase in value pretest and posttest through statistical analysis, application validation tests by experts, and trials in the community. The trial results were carried out four times over a period of four months. Stage (1) was carried out to standardize the material by 6 Yogyakarta State University Islamic Religious Education lecturers and mentors. Stage (2) as many as 20 people users to get feedback and input for finalizing the application. Stage (3) was carried out to obtain the impact of using the application in a community environment with 30 people at the TPA pretest and posttest. Stage (4) develops the application perfectly; the target user is 150 - 200. The test results on a scale of 3 on 30 students (on average) show that there are quite significant differences before and after using the Qwhizy application, the test results are in Appendix 2. The validation results carried out by material, design and media experts can be seen in Table 3.

Table 3. Material Expert Validation Results

No	Rated aspect	Member 1	Member 2	Score	Maximum Score
1	Qwhizy material suitability	70	69	139	150
2	Qwhizy content suitability	47	45	92	100
		Score		**231**	**250**
		Mark			**91.55%**

Based on Table 3, the results of expert validation regarding material delivery by the Qwhizy product obtained a percentage of 91.55%, with the criteria very worthy. Furthermore, the results of the design expert validation can be seen in Table 4.

Table 4. Design Expert Validation Results

No	Rated aspect	Member 1	Member 2	Score	Maximum Score
1	Qwhizy Design Compatibility with Hafiz Requirements	47	46	93	100
2	Quality Design Qwhizy with Construction Requirements	23	22	45	50
3	Qwhizy Layout and Design Techniques	46	48	94	100
		Score		**232**	**250**
		Mark			**91%**

Based on Table. 4 shows that the value of the design expert validation results for the Qwhizy Product was obtained with a percentage of 91% by category very worthy. Furthermore, the results of media expert validation can be seen in Table 5.

Table 5. Media Expert Validation Results

No	Rated aspect	Member 1	Member 2	Score	Maximum Score
1	Qwhizy material suitability	70	72	142	150
2	Suitability of the content of Qwhizy Media for Memorizing the Qur'an	47	45	92	100
		Score		**234**	**250**
		Mark			Mark

Based on Table. 5 shows that the value of media expert validation results on Qwhizy was obtained with a percentage of 92.88% by category very worthy.

5. Evaluate

This stage is a continuous evaluation of the applications that have been created. Applications are routinely monitored and checked for detection bug that may arise, thereby ensuring optimal performance and in line with current developments. Apart from that, additional features are continuously being improved to improve the quality of application services. The application is also published on the Google Play Store to make it easier for users to access it.

Discussion

The research and development process of the Qur'an Whiz application for children with dyslexia has succeeded in producing an application that is not only visually attractive but also effective in improving the ability to learn to memorize the Qur'an. Based on the results of analyzes carried out in various locations, such as the Nurul Islam Glagahombo Mosque, the Mujahidin Mosque at Depok 2 Vocational High School Sleman, the UNY Islamic Spiritual Activity Unit, and the At-Taqwa Pancoh Kulon Mosque, researchers identified various problems faced by pupils and students, especially in terms of *tajwid* laws, motivation to memorize, and the right method for memorizing the Qur'an. This problem is the basis for developing the Qur'an Whiz application tailored to user needs.

The application design phase focuses on developing an intuitive user interface, engaging interactive features, and educational material relevant to children's needs. Application development is carried out using the Flutter framework and the Dart programming language, allowing the application to run on both iOS and Android platforms. Hopefully, this user-based design approach will make it easier for children to learn to read the Koran and increase their motivation to study harder. With features such as quizzes, *hafidz* battles, and daily challenges, this application provides a fun experience in the process of learning the Al-Qur'an.

The results of application implementation show a significant increase in user pretest and posttest scores, which indicates that the Qur'an Whiz application can positively impact children's ability to memorize the Al-Qur'an. Trials carried out in the community, especially in TPA, showed a significant difference in the ability to read and memorize the Al-Qur'an after using this application. This is also supported by validation results from material experts, design experts, and media experts, all of whom gave a "very feasible" rating with percentages of 91.55%, 91%, and 92.88% respectively. The results of this validation show that the Qur'an Whiz application has met the expected standards in terms of material, design and media used.

Overall, the Qur'an Whiz application shows that multimedia-based technology can effectively support children, especially those with dyslexia, in improving their ability to read and memorize the Qur'an. This application makes learning easier and increases children's motivation and enthusiasm in memorizing the Al-Qur'an. It is hoped that this research can positively contribute to the development of technology-based educational applications that can be accessed by all groups, especially those who need special learning approaches.

Conclusion

The Qur'an Whiz application has proven effective in improving Qur'an memorization among children, particularly through applying the *Takrir* method in a gamified context. The significant improvement in memorization, as shown by the increase in participants' scores from 65 to 85, indicates the effectiveness of the application in enhancing learning outcomes. Expert validation results further confirm the quality of the application, with material, design, and media validations all exceeding 90%. The interactive features, such as leaderboards and daily challenges, have successfully motivated students to engage more deeply with their learning. This application presents an innovative approach to religious education, leveraging technology to enhance the Qur'an memorization process in the digital age.

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