

The emergence of a technology-based scheme for monitoring and managing remembrance in Al-Quran knowledge

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Article Info	Abstrak
<p><i>Article history</i></p> <p>Received : Feb 23, 2025 Revised : Mar 11, 2025 Accepted : Marc 20, 2025</p>	<p>Pendidikan hafalan Al-Quran memiliki peran penting dalam membentuk karakter dan kecerdasan spiritual anak sejak dini. Untuk meningkatkan efektivitas pembelajaran tahfiz, diperlukan sistem yang tidak hanya memantau tetapi juga mengelola progres hafalan secara terstruktur. Kegiatan pengabdian ini bertujuan untuk mengembangkan sistem manajemen dan pemantauan hafalan berbasis teknologi informasi di Tahfiz Anak Usia Dini (TAUD). Permasalahan utama yang dihadapi adalah belum adanya sistem terintegrasi yang memungkinkan pencatatan, evaluasi, dan pelaporan perkembangan hafalan secara komprehensif. Solusi yang ditawarkan adalah pengembangan aplikasi worksheet berbasis web yang memungkinkan siswa, guru, dan orang tua untuk memantau serta mengelola progres hafalan secara real-time. Metode yang digunakan meliputi asesmen kebutuhan, pengembangan sistem, pelatihan guru, implementasi aplikasi, serta evaluasi keberhasilan program. Hasil evaluasi melalui pre-test dan post-test menunjukkan peningkatan rata-rata pemahaman sebesar +35,33 poin bagi orang tua dan +35 poin bagi guru setelah pelatihan dan penggunaan sistem. Pendampingan dilakukan secara berkala untuk memastikan keberlanjutan penggunaan sistem. Hasil ini menunjukkan bahwa pemanfaatan teknologi dapat meningkatkan efektivitas pengelolaan hafalan serta keterlibatan orang tua dalam mendukung pembelajaran tahfiz anak.</p>
<p><i>Kata Kunci:</i></p> <p>Hafalan Al-Qur'an; Pendidikan Tahfiz; Sistem Manajemen Progres; TAUD; Teknologi Informasi;</p>	<p><i>Abstract</i></p> <p><i>Quran memorization education plays an important role in shaping children's character and spiritual intelligence from an early age. To improve the effectiveness of tahfiz learning, a system is needed that is not only harmonious but also manages memorization progress in a structured manner. This community service activity aims to develop a memorization management and monitoring system based on information technology in Early Childhood Tahfiz (TAUD). The main problem faced is the absence of an integrated system that allows comprehensive recording, evaluation, and reporting of memorization progress. The solution offered is the development of a web-based worksheet application that allows students, teachers, and parents to communicate and manage memorization progress in real-time. The methods used include needs assessment, system development, teacher training, application implementation, and evaluation of program success. The results of the evaluation through pre-test and post-test showed an average increase in understanding of +35.33 points for parents and +35 points for teachers after training and use of the system. Mentoring is carried out periodically to ensure continued use of the system. These results indicate that the use of technology can increase the effectiveness of memorization management and parental involvement in supporting children's tahfiz learning.</i></p>

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INTRODUCTION

Early character development and spiritual intelligence are significantly influenced by Quran

remembering education (Bayu et al., 2025). A well-oiled system is necessary for students to successfully and methodically meet their memorization goals when memorizing the Quran, which is a type of learning in the context of religious education (Izzah et al., 2024). TAUD Maryam is One of the early childhood education centers in Pariaman that emphasizes memorizing the Quran. Although the number of students at TAUD Maryam has increased since its founding, the school continues to encounter a number of obstacles that reduce learning effectiveness.

In addition to the growing student body, the educational system must be innovative in order to facilitate the efficient administration of memorizing of the Al-Quran (Luqmana et al., 2023). It has been demonstrated that the use of technology in education, particularly in tahfiz learning, can boost parental involvement, speed up the evaluation process, and help teachers give more focused instruction (Ratar et al., 2023). One strategic move to address the issues TAUD Maryam is facing is the creation of a technology-based management system (Priambodo, 2022). It is envisaged that an integrated system will improve the effectiveness of the memorization monitoring process, facilitate the development of student memorization, and create a more controlled and methodical learning environment for parents and teachers. (Susilawati et al., 2024).

One of the main issues at TAUD Maryam is the absence of an integrated system for tracking memorization progress (Azman Shahrudin et al., 2024). Effective feedback in the learning process is lacking because parents and teachers find it difficult to track kids' memorizing progress in real time (Minh, 2024). Beyond that, TAUD Maryam's administrators and teachers lack a thorough understanding of how to effectively manage goals (also known as goal setting) in tahfiz education. As a result, neither the learning process nor the memorization skills of the students have been optimized. (Muslem et al., 2022). Along with the pedagogical difficulties, there is still a dearth of technology to assist tahfiz learning (Malik & Frimadani, 2023b). The learning management system can benefit greatly from information technology, particularly when it comes to tracking and assessing student progress. Numerous studies have demonstrated that integrating technology into the classroom can improve learning outcomes and efficiency (Malik & Frimadani, 2022). As of right now, TAUD Maryam has not expressly created a technology-based approach to check student memorisation. (Malik & Frimadani, 2023a).

Currently, memorization monitoring at TAUD Maryam is still conducted manually, which can cause delays in evaluation and hinder the systematic recording of student progress. Without an integrated system, parents have limited access to information on their children's growth, and teachers are forced to use antiquated techniques that are less effective at handling memorisation data (Anas et al., 2024). In addition to overcoming these difficulties, a technology-based approach can offer a more precise way to record and analyse memorisation data (Fajri et al., 2024). Thus, the use of information technology is expected to be a tool that supports the sustainability of the tahfiz learning process, enables more effective management, and increases the involvement of all parties in supporting the achievement of optimal student memorization (Belva Saskia Permana et al., 2024).

Scientific inquiry on the use of technology in religious education has started to emerge in recent years, particularly with regard to memorisation of the Al-Quran (Abdul Aziz, 2024). Several researchers' studies demonstrate that technology-based applications can boost learning efficiency and motivation for memorisation (Demmanggasa Yultan et al., 2023). However, early childhood education institutions, particularly those in Indonesia, are still lagging behind in implementing this technology (Pengajian et al., 2024). Therefore, by creating a web-based and mobile system to assist educators, learners, and parents in tracking memorisation progress, this community service project seeks to close this gap.

In order to facilitate more systematic and real-time memorisation monitoring, the web-based worksheet was created to be conveniently accessible by all parties involved, including parents, teachers, and students. Key features include goal-setting tools, automated reminders for periodic assessments, and progress tracking to enhance the effectiveness of memorization learning (Ramos-Vega et al., 2021). Beyond that, incorporating technology into tahfiz instruction seeks to give teachers more organised resources for overseeing students' memorisation development and to boost parental involvement in helping their kids memorise (Akbar & Noviani, 2019). By using this strategy, TAUD Maryam can use more contemporary, data-driven teaching techniques, which will eventually raise the standard of tahfiz instruction in a sustainable way.

This study aims to address the challenges at TAUD Maryam by developing an information

technology-based memorization management and monitoring system. This memorisation progress monitoring management system allows parents to keep an eye on their children's progress, teachers to give more focused guidance, and students to see how their memorisation has improved. The quality of education at TAUD Maryam is expected to improve dramatically with the application of this solution, which will benefit all stakeholders.

METHOD

A methodical methodology that may incorporate technology into the process of tracking and assessing student memorisation is required in order to increase the efficacy of Al-Quran memorisation instruction at TAUD Maryam. The implementation of an information technology-based memorization management system is expected to provide structured and real-time access to memorization progress data for educators, students, and parents (Anas et al., 2024). To ensure a smooth implementation and long-term benefits, this community service project adopts a structured methodology. The approach aims to develop a system that aligns with user needs and encourages active participation from all stakeholders in the learning process.

This study employs a user-centered design (UCD) approach combined with Agile software development to ensure that the system meets the needs of its users. The five key phases in this research include requirements analysis, system development, teacher training, implementation and trial, and evaluation and mentoring (Bayu et al., 2025). To collect data, a mixed-methods approach was applied, combining qualitative and quantitative methods to enhance the validity of findings. Data collection techniques include Stakeholder Interviews, Direct observation of student memorization sessions (n=30) to assess current tracking methods, System Usability Testing, and Comparative analysis of memorization performance before and after system implementation, using students' progress reports as data sources. This stage of the model was selected in order for the outcomes to actually affect TAUD Maryam, both in terms of improving learning efficacy.

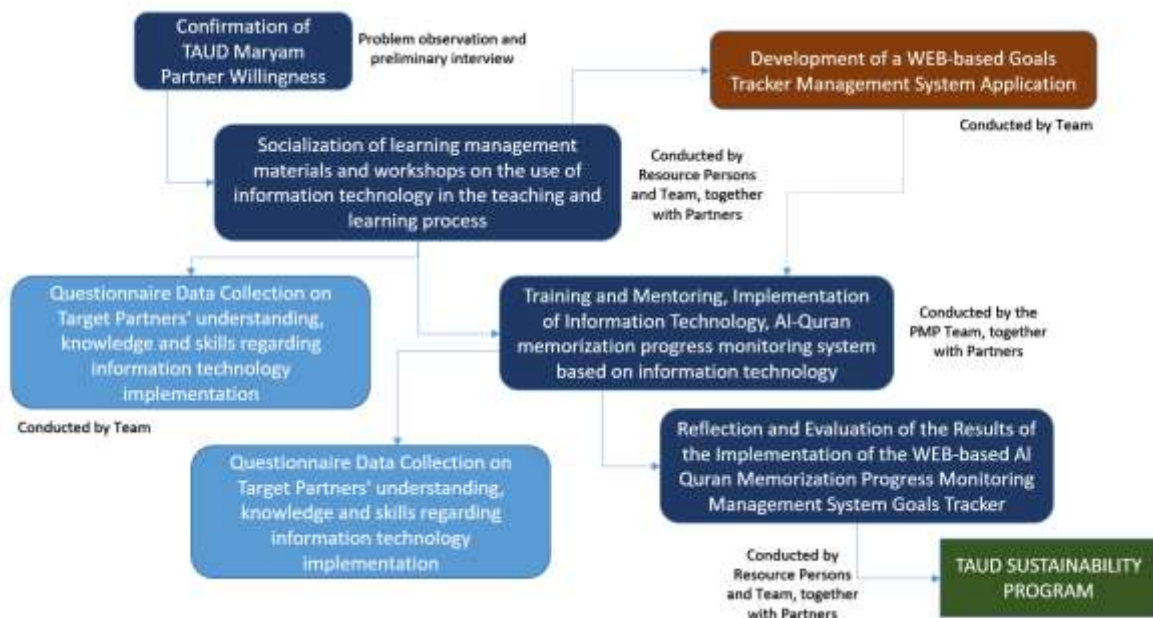


Figure 1 . Flowchart of Community Service Implementation Stages (Malik & Frimadani, 2023b)

In Figure 1, the stages in implementing the solution offered are as follows:

a. Requirements Analysis:

Through observation, interviews with educators and administrators, and conversations with student parents, this phase seeks to pinpoint the primary issues TAUD Maryam is facing. The

information gathered includes the necessity of a method for tracking memorisation, challenges with technology use, and knowledge of goal-setting in memorisation instruction (Malik & Octafia, 2023). This phase aims to identify the primary challenges faced by TAUD Maryam through Interviews with teachers, school administrators, and parents to gather insights on existing memorization tracking issues. Observation of classroom activities to analyze how students currently track their memorization.

b. System Development:

The community service team started creating a mobile and web-based system to track pupils' memorisation progress after analysing the needs. Based on the gathered requirements, the research team developed a web and mobile-based system for memorization progress tracking. The system was designed to be user-friendly, ensuring accessibility for teachers, students, and parents (Zorzetti et al., 2022). The Agile methodology, which permits incremental testing and improvement, was used to carry out the development (Gothelf & Seiden, 2021).

c. Training for Teachers:

Comprehensive training sessions were conducted to equip teachers with technical knowledge on system usage. The training also included best practices for goal-setting in memorization instruction (Rosyada & Sundari, 2021).

d. Implementation and Trial:

The system was piloted over four weeks with two groups of students (n=50 in total) to assess usability and effectiveness. User feedback surveys were conducted at the end of each week to identify areas for improvement (Martins et al., 2016).

e. Evaluation and Mentoring:

Memorization progress data was compared pre- and post-implementation to measure improvements in learning outcomes. System usability was evaluated using SUS scores, and follow-up mentoring was provided to address challenges encountered by teachers and students.

All of the steps that have been taken to put this structure into place have been crucial to the community service program's success. In order for the solutions created to address the primary issues that instructors, students, and parents encounter, needs assessment serves as the foundation for system design that is in line with TAUD Maryam's requirements and circumstances. The Agile process is used to design systems iteratively, allowing for ongoing improvement depending on user input. A key component of guaranteeing successful technology adoption is teacher training, in which educators receive technical knowledge about the system's operation and goal-setting techniques for memorisation.

Implementation and trials are carried out as validation steps before the system is fully implemented, in order to measure its effectiveness in supporting rote learning. Evaluation and mentoring carried out continuously aim to ensure that this system can be used optimally in the long term, as well as provide solutions to various technical and non-technical obstacles that arise during implementation.

RESULTS AND DISCUSSION

To ensure the effectiveness and sustainability of the web-based Quran memorization monitoring system at TAUD Maryam, its implementation was carried out in phases. The process began with a needs assessment to identify key challenges in the memorization learning process. A technology-based system was then developed to facilitate real-time monitoring, accessible by parents, teachers, and students. Following the system's development, teacher training was conducted to maximize its utility. A trial implementation assessed the system's impact on memorization quality, followed by continuous evaluation and mentoring to measure effectiveness and provide support.

a. Requirements Analysis:

The initial stage in implementing IPTEKS at TAUD Maryam is to conduct a needs assessment to identify the main problems in the process of learning to memorize the Quran. Direct observations were made of teaching and learning activities, as well as interviews with teachers and administrators to understand the challenges they face. Discussions with parents of students were also conducted to find out their expectations of the memorization monitoring system. The findings highlighted issues such as:

(a) Lack of a structured method for tracking memorization progress. (b) Limited parental involvement due to lack of access to progress reports. (c) Difficulty in setting and monitoring memorization goals.

b. System Development:

Based on the needs assessment, a web-based system was developed to monitor students' memorization progress. This system is designed to have a simple appearance and easy to use by various parties involved, namely teachers, parents, and administrators. The system includes features such as Student progress tracking for teachers and parents, Goal-setting functions to make memorization targets measurable, Automated progress reports to facilitate evaluation, and Mobile accessibility to enhance user engagement. The following diagram illustrates the TAUD Maryam Memorization Management System Implementation Design Framework



Figure 2 . TAUD Maryam Memorization Management System Implementation Design Framework

The system promotes active participation from parents, teachers, and students. Teachers collect and analyze progress data, parents engage in discussions on their child's progress, and the system processes this data to provide insights for better decision-making. Parents play an active role in supporting their children's education through communication with teachers. Teachers, as the main managers of learning, collect information from various sources, including input from parents and student academic data. This information is then processed using digital technology, such as worksheet-based learning management systems and data analytics, to produce insights that help in decision-making related to learning.

Meanwhile, educational institutions are the primary enablers of this system, offering legislation and infrastructure as support. This approach, which connects all stakeholders through technology, seeks to improve educational transparency, speed up information availability, and guarantee that all decisions are supported by current and accurate data. This diagram also illustrates how digital technology can serve as the primary connection in the educational ecosystem, where each player plays a crucial part in developing a more modern and efficient learning environment.

c. Training for Teachers

To ensure smooth adoption, intensive training was provided to teachers on Inputting student memorization data, Evaluating student progress, and also Utilizing goal-setting features for structured memorization. Teachers were also introduced to technology-based learning management principles to enhance their instructional effectiveness.

d. Implementation and Trial:

Following training, multiple student groups participated in a weeks-long system test. The purpose of this trial was to assess how well the system monitored memorisation and identified potential use-related problems. A four-week trial phase was conducted, involving multiple student groups. The primary objectives were to evaluate the system's effectiveness in tracking memorization and identifying potential issues. Key findings included Increased teacher efficiency in recording and monitoring memorization progress, Higher parental engagement, as they could track their child's progress in real time, and Enhanced student motivation due to clear goal-setting features. Challenges include Some users found the interface unintuitive, and limited internet access in certain areas hindered real-time updates. Based on input from teachers and parents, the team refined the system before it was implemented more widely.

e. Evaluation and Mentoring:

The system implementation was carried out through trials on several groups of students by involving teachers and parents in the monitoring process. Evaluation of the success of the program was carried out by comparing the results of the pre-test and post-test to measure the increase in understanding and skills in using this system. Testing was carried out through a pre-test before training and a post-test after training and system implementation. The results of the evaluation of 9 parents of students showed an increase in the average score of +35.33 points, with pre-test scores ranging from 35 to 60 and post-test scores increasing to 70 to 90. Likewise, the evaluation of teachers showed an increase in understanding with an average increase in score of +35 points, where pre-test scores ranged from 50 to 60 and increased to 88 to 92 in the post-test. The success of the system was assessed using pre-test and post-test evaluations of teachers and parents. The following table summarizes the evaluation results as Figure 3.

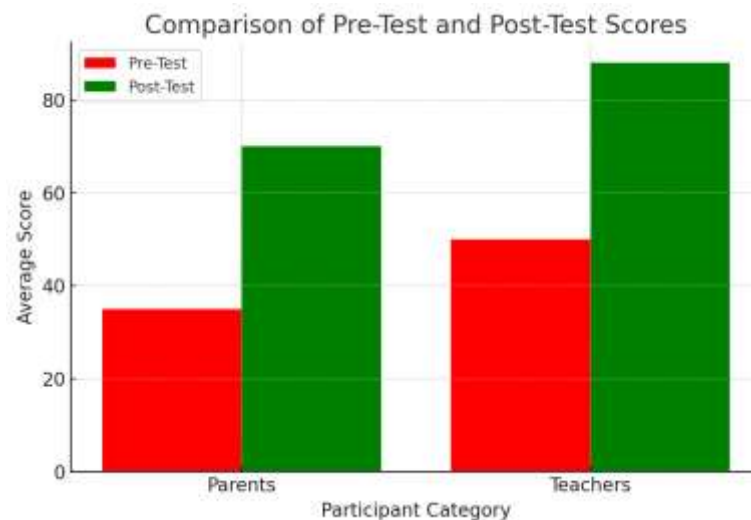


Figure 2 . Pre-Test vs. Post-Test Score Improvement

These results demonstrate a significant improvement in participants' understanding and ability to use the system effectively. While the system demonstrated positive outcomes, several challenges were identified: (a) Technical Barriers: Some teachers required additional support to familiarize themselves with the digital platform. (b) Internet Accessibility Issues: Limited internet connectivity in certain areas reduced real-time monitoring efficiency. (c) User Interface Limitations: Some users found the system navigation less intuitive, requiring interface refinements. (c) Several factors played a crucial role in the successful adoption of the system such as User-Centered Design (UCD), Teacher training sessions

enhanced system adoption and effective use, Real-time progress tracking motivated parents to be more involved in their child's learning, and The inclusion of measurable memorization targets improved student motivation.

CONCLUSION

The implementation of a web- and mobile-based worksheet monitoring system has significantly improved parents' and teachers' ability to track students' Quran memorisation progress, as demonstrated by the pre-test and post-test results. The system has enhanced the efficiency of memorisation assessments by providing teachers with structured tools for evaluating students' progress, while also fostering greater parental involvement in their children's learning journey. Key findings indicate that both parents and teachers experienced notable improvements in their understanding and usage of the system, with an average post-test score increase of 35 points.

However, despite the overall success, some users still require technical assistance, particularly in navigating certain system features and adapting to digital tools. Additionally, limitations such as internet accessibility issues and the need for a more user-friendly interface remain challenges that must be addressed. To ensure the long-term sustainability of the system, continuous mentoring and technical support are provided through online guidance sessions and instructional materials. Future improvements should focus on enhancing system usability, addressing connectivity constraints, and incorporating further automation features to optimise the effectiveness of the Quran memorisation monitoring process at TAUD Maryam.

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