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Valid and practical integrated monitoring instrument of tahfidz qur'an

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ABSTRACT

In implementing tahfidz qur'an learning in Islamic boarding schools, students must face many activities, and they are usually given up to five times a day. Almost all of these activities must be recorded by the teacher in a logbook so that there is the potential for slow and invalid reporting. This study aims to create an integrated monitoring instrument of tahfidz qur'an and reveal its validity and practical values. This study was conducted using a research and development (R&D) approach. The instrument was created by combining the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) development procedure and the Rapid Application Development (RAD) development procedure. Furthermore, the application of the Object-Oriented Programming (OOP) paradigm into the application creation process aims to produce a monitoring instrument that is integrated into various types of devices and can provide data and information on the student's achievement of tahfidz qur'an learning to all interested parties. The results of the validity test revealed an Aiken's V value of 0.81 so it was worthy of being tested at the implementation stage. The implementation resulted in a practicality value of 80.65% from teachers, 79.84 from parents of students, and 78.28% from the management of the boarding school. Overall, both teachers, parents of students, and management stated that this integrated monitoring instrument of tahfidz qur'an was practical during use.

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1. INTRODUCTION

Islamic boarding school-based education is increasingly in demand in Indonesia. Based on data from the Ministry of Religion, the number of Islamic boarding schools in Indonesia was recorded at 36,600 in 2022 [1]. This number increased by 6.67% or 2,443 in 2023, which was 39,043 [2]. This is inseparable from the existence of tahfidz qur'an learning as a superior program implemented in Islamic boarding schools. Learning tahfidz qur'an, in addition to requiring intelligence and sincerity, also requires planning, determination of methods, systematic steps, and accuracy of learning methods [3] as well as support and motivation [4]. In the implementation of tahfidz Qur'an learning, there are many activities that are usually faced by students, namely

nyetor, murajaah, mudarasah, sima'an, takaran, talaqqi, and others [5]. Almost all of these activities must be recorded by the teacher in a notebook. In addition, in Islamic boarding schools, tahfidz Qur'an learning is given every day and up to five times a day. Inappropriate instruments cause the process of recording students' daily achievements to be complicated and tiring. This condition has the potential for slow and invalid reporting. In fact, Islamic boarding schools are responsible for informing the development of students' education to their parents [6], [7]. Therefore, a tahfidz monitoring instrument is needed that is able to simplify the recording process and is able to provide Islamic boarding school management, principals, and even parents of students with valid information on students' memorization achievements quickly. So that the evaluation of the success of the memorization target can also be carried out validly and practically [8], [9].

Several previous studies have been conducted. For example, by designing an Android-based Quran memorization monitoring application [10] or developing a web application to monitor and evaluate the Quran memorization program [11]. Other researchers implemented memorization learning via the Zoom and Whatsapp applications [12]. However, this application is not designed for the Islamic boarding school environment. Another proposal is the implementation of monthly evaluations to increase the activeness of students [13]. Regarding the involvement of parents in the monitoring process, an Android-based interactive book has been designed [14]. However, the instruments that have been applied in previous studies are not fully integrated into all devices and all stakeholders. In addition, previous studies did not explicitly reveal the validity, practicality, and effectiveness values.

This study will focus on creating an integrated tahfidz monitoring instrument and reveal its validity and practicality values. Furthermore, the application of the PBO paradigm into the application creation process is expected to produce an integrated tahfidz qur'an monitoring instrument into various types of devices and is able to provide data and information on the development of tahfidz learning to all interested parties.

2. METHOD

This research was conducted using the R&D approach. The product resulting from this research is an integrated Quran memorization monitoring instrument model. The instrument was created by combining the ADDIE development procedure and the RAD development procedure. ADDIE consists of five stages, namely: analysis, design, development, implementation and evaluation [15]. While RAD consists of the stages of determining project requirements, making prototypes, implementing rapid construction and collecting feedback, and the implementation or completion stage of the product [16]. The Quran memorization monitoring instrument application was created using the PBO paradigm. This is done to facilitate the collaboration process at the stage of writing program code. PBO is able to combine various attributes such as reusability, maintainability, and reliability [17], [18] and is supported by the model view control (MVC) framework which separates the control, display, and data processes [19]. The validity test was conducted using the focus group discussion method [20], while the practicality test used a practicality questionnaire. Figure 2 illustrates the research and development process of the combined results of ADDIE and RAD.

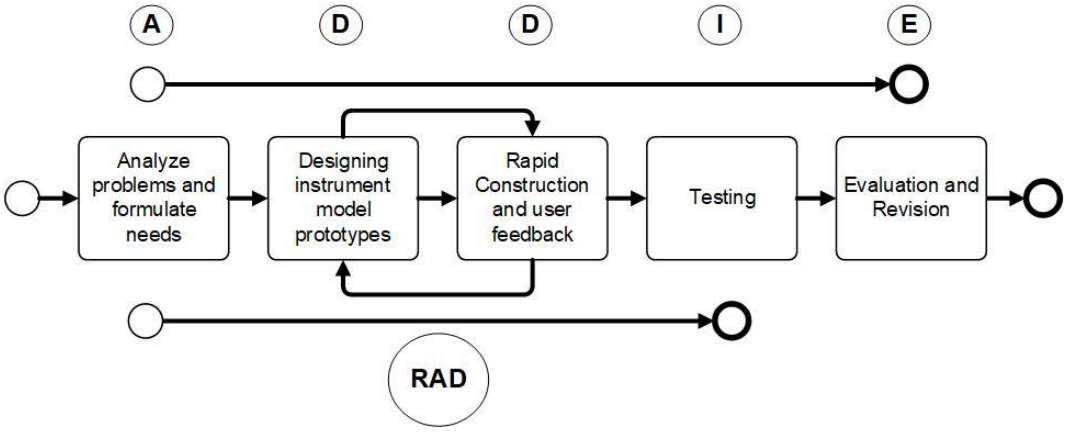

Figure 1. Research and development process

2.1 Problem Analysis and Formulating Needs

This stage includes the process of collecting primary data through observation, interviews, and literature studies. Observations and interviews were conducted on samples of nine Islamic boarding schools in South Sumatra. At this stage, two teachers will be randomly selected from each sample to be interviewed regarding the tahfidz learning process. The data that has been collected through observation, interviews and literature studies, becomes the material for identifying problems and formulating data and function needs.

2.2 Designing the Instrument Prototype

The problems that have been identified and the needs that have been formulated are the basis for designing the initial prototype of the tahfidz monitoring instrument application. Some of the designs that must be prepared are as follows:

1) System architecture design: This stage includes the following activities: designing a database to store student data, memorization, deposits, and others; and determining the application workflow, such as the deposit process, attendance, assessment, and reporting.
2) User interface (UI) design: This stage includes the following activities: designing the appearance of the application; choosing typography, colors, and images that are appropriate to the target user; and ensure the application is easy to navigate and understand.
3) User experience (UX) design: This stage includes activities: designing an intuitive and efficient application usage flow; and ensuring the application is easy to use by students, teachers, and parents.
4) Feature design: This stage includes activities to design memorization deposit features, attendance features, assessment features, and reporting features.
5) Security design: This stage includes activities: designing access restrictions to the application and implementing appropriate data security protocols.

2.3 Rapid Construction and User Feedback

The prototype design that has been made then becomes a reference for the construction of the initial prototype of the tahfidz monitoring instrument application. At this stage, the process of writing the program code is carried out using the services of a research assistant in the form of a Web programmer. The initial prototype that is ready is then asked for feedback from the user. This activity aims to filter input from users for the development of the prototype that has been made. This process is carried out continuously until the user states that the prototype that has been developed is considered to have met the needs.

2.4 Trial

Validity Test

The validity test involved 2 IT experts, 2 education evaluation experts, and 2 Quran memorization education practitioners. The experts will be asked for their opinions in a focus group discussion (FGD) session. The validity test was measured using the V Aiken's formula to calculate the content validity coefficient based on the results of assessments by several experts on an item in terms of the extent to which the item represents the measured construct. If the V Aiken's value is above 0.6, it is declared valid.

Practicality Test

The practicality test in the form of a questionnaire was used to measure the level of practicality of the Quran memorization monitoring instrument. The questionnaire aims to see the responses of teachers, Islamic boarding school management and parents of students to the implemented instrument. The questionnaire was compiled using a Likert scale with a range of 1 (strongly disagree) to 5 (strongly agree). The practicality questionnaire was compiled based on several aspects and indicators according to the results of the needs formulation. The results of the respondent's assessment were analyzed to determine the level of practicality. The practicality value was calculated using formula (1).

$$practicality\ value = (total\ score\ obtained) / (maximum\ score)\ x100\% \quad (1)$$

2.5 Evaluation and Revision

After the trial is conducted, an evaluation is carried out based on the trial data and revisions are made to improve the final results.

3. RESULTS AND DISCUSSIONS

3.1 Development Results

Use Case Diagram

The integrated Quran memorization monitoring instrument involves at least 3 actors. The three actors are teachers, guardians of students, and management of Islamic boarding schools. The teacher actor can add students, determine memorization targets, input student memorization, give assessments, and give feedback. The parent actor can view student profiles, view student memorization progress, and get notifications.

Meanwhile, the management actor of the Islamic boarding school sees the overall report and makes policies related to student learning (see Figure 2).

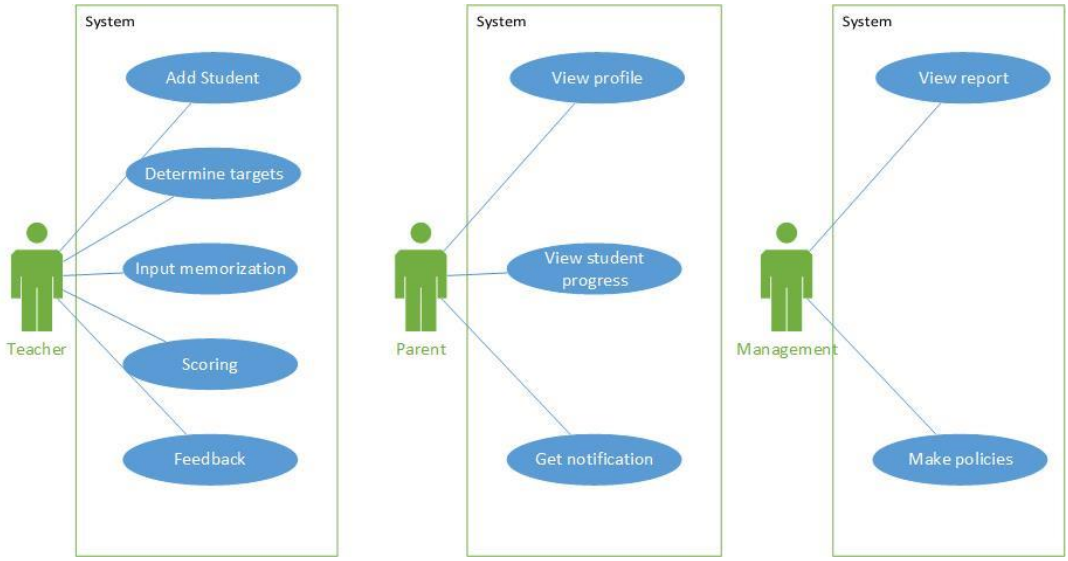

Figure 2. Functions of the teacher actor, parent actor, and management actor

User Interface Display

The user interface is designed to be intuitive and easy to understand, especially for users who are less familiar with technology. In addition, the layout of the elements on the screen (buttons, menus, icons) is logical and easy to find. The user manual (tooltip, help menu) is clear and helpful and users can quickly find the information they need. Frequent tasks (e.g., inputting memorization data, viewing reports) can be completed in a few steps. In terms of time required, users are encouraged to interact with the system minimally. The interface supports all tasks required in the tahfidz monitoring process (data input, tracking progress, evaluation). The interface design makes it easy for users to complete these tasks and the interface display is attractive and professional. Of course, the selection of colors, fonts, and images is in accordance with the target user.

Figure 3(1) displays the user login page. On this page, there is a column for inputting username and password. The system will detect the role (teacher/guardian of students/management/administrator) based on the username entered. Figure 3(2) displays the memorization progress input page while Figure 3(3) displays the page for viewing the student's memorization progress.

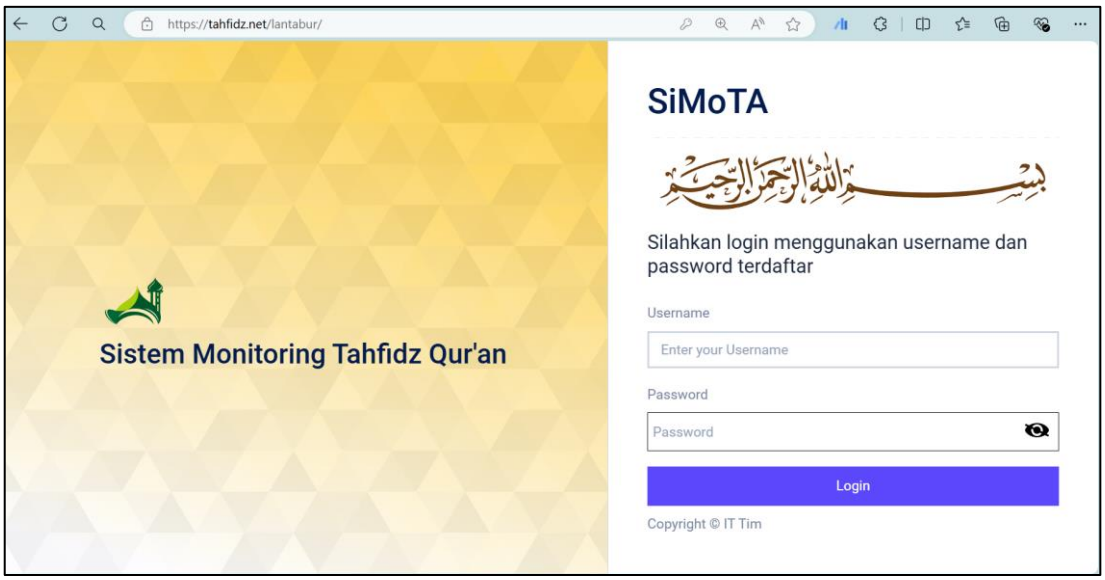

Figure 3(1). User login display

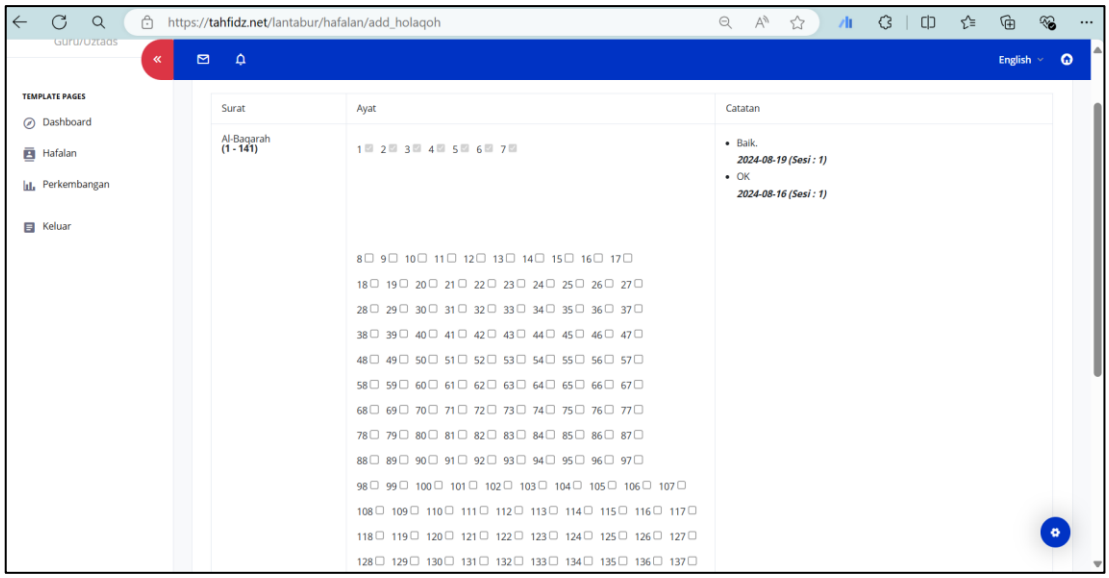

Figure 3(2). Menu display for recording memorization progress

Figure 3(3). Memorization progress menu display

3.2 Validity Test Results

The validation conducted by experts on the integrated tahfidz monitoring instrument includes several aspects, namely: functionality, performance, security, integration, alignment to objectives, data validity and reliability, flexibility in evaluation, data analysis, and constructive feedback. The results of the validator's assessment of the integrated tahfidz monitoring instrument are shown in table 1.

Table 1. Validity

Aspect		∑s	Aiken's V
Functionality	Indicator 1	18	0.75
	Indicator 2	20	0.83
	Indicator 3	20	0.83
Performance	Indicator 4	19	0.79
	Indicator 5	18	0.75

	Indicator 6	19	0.79
Security	Indicator 7	16	0.67
	Indicator 8	18	0.75
	Indicator 9	19	0.79
Integration	Indicator 10	19	0.79
	Indicator 11	20	0.83
Alignment Of Learning	Indicator 12	20	0.83
Objectives	Indicator 13	21	0.88
Validity And Reliability of	Indicator 14	18	0.75
Data	Indicator 15	18	0.75
Flexibility In Evaluation	Indicator 16	20	0.83
	Indicator 17	21	0.88
In-Depth Data Analysis	Indicator 18	21	0.88
	Indicator 19	21	0.88
Constructive Feedback	Indicator 20	19	0.79
	Indicator 21	22	0.92
Total		**407**	**0.81**
Description			**valid**

The results of the data analysis obtained an Aiken's V value of 0.81. The Aiken's value range is 0 to 1. From this range, the number 0.60 can be interpreted as having a fairly high coefficient. Thus, the Aiken's V value of 0.81 can be stated in the valid category. Based on the suggestions obtained from experts, a revision was made so that a valid integrated tahfidz monitoring instrument construct was obtained that was worthy of being tested.

3.3 Practicality Test Results

The practicality test of the integrated tahfidz monitoring instrument was carried out after the validity instrument was validated by experts and the results were declared valid. The results of the analysis of the practicality of the integrated tahfidz monitoring instrument can be seen from the results of the implementation of the integrated tahfidz qur'an monitoring instrument which was carried out by conducting an instrument trial.

The implementation of all trial activities has been carried out in accordance with the stages of recording that have been designed. From the description of observation data, interviews by validators, comments from teachers, guardians of students, and management of Islamic boarding schools, it shows that the practicality of the integrated Quran memorization monitoring instrument is very practical. To prove that the instrument is practical, then: 1) The results of expert and practitioner assessments show that the assessment instrument can be implemented and last throughout the learning process; 2) The results of field observations show that students and teachers can carry out activities in accordance with the activities listed in the system design.

In this study, the number of partners involved in the implementation of the trial was six Islamic boarding schools located in 3 cities/regencies in the province of South Sumatra. Each partner involved 3 tahfidz teachers, 10 guardians of students, and 2 people from the management of the Islamic boarding school. So that the total parties involved were 18 teachers, 60 guardians of students, and 12 people from the management of the Islamic boarding school. Both teachers, guardians of students, and the management of the Islamic boarding school have responded to the practicality instrument. Table 2 describes the results of the practicality test given to teachers, guardians of students and the management of the Islamic boarding school after the trial was carried out.

Table 2. Practicality

Aspect		**Teacher's Responses**		**Parent's Responses**		**Management's Responses**	
		∑	%	∑	%	∑	%
User Interface (UI)	Statement 1	68	76%	240	80%	42	70%
	Statement 2	72	80%	255	85%	49	82%
	Statement 3	69	77%	247	82%	52	87%
	Statement 4	71	79%	241	80%	46	77%
	Statement 5	70	78%	235	78%	45	75%
	Statement 6	69	77%	237	79%	51	85%
	Statement 7	75	83%	236	79%	49	82%
	Statement 8	67	74%	239	80%	49	82%
	Statement 9	73	81%	243	81%	47	78%

	Statement 10	68	76%	250	83%	45	75%
User Experience (UX)	Statement 11	73	81%	251	84%	51	85%
	Statement 12	72	80%	238	79%	46	77%
	Statement 13	76	84%	235	78%	46	77%
	Statement 14	72	80%	228	76%	46	77%
	Statement 15	74	82%	244	81%	48	80%
	Statement 16	72	80%	245	82%	48	80%
	Statement 17	77	86%	241	80%	46	77%
	Statement 18	77	86%	227	76%	47	78%
	Statement 19	75	83%	239	80%	48	80%
Fixture	Statement 20	67	74%	239	80%	47	78%
	Statement 21	76	84%	241	80%	47	78%
	Statement 22	81	90%	238	79%	49	82%
	Statement 23	73	81%	253	84%	42	70%
	Statement 24	75	83%	241	80%	51	85%
	Statement 25	65	72%	230	77%	44	73%
Security	Statement 26	75	83%	231	77%	46	77%
	Statement 27	77	86%	238	79%	46	77%
	Statement 28	72	80%	222	74%	48	80%
	Statement 29	72	80%	246	82%	45	75%
	Statement 30	71	79%	241	80%	50	83%
	Statement 31	77	86%	230	77%	44	73%
	Statement 32	76	84%	242	81%	41	68%
	Statement 33	70	78%	237	79%	49	82%
	Statement 34	71	79%	244	81%	47	78%
Total		**2468**	**80,65%**	**8144**	**79,84%**	**1597**	**78,28%**
Description		**Practical**		**Practical**		**Practical**	

Based on the practicality data, the average percentage of teacher assessment of the monitoring instrument is 80.65% and the average percentage of guardian assessment of the monitoring instrument is 79.84%. Meanwhile, the average percentage of Islamic boarding school management assessment of the monitoring instrument is 78.28%. This condition shows that both teachers, guardians and Islamic boarding school management consider the integrated Quran memorization monitoring instrument to be practical when implemented. Figure 4 shows a comparison of each respondent group.

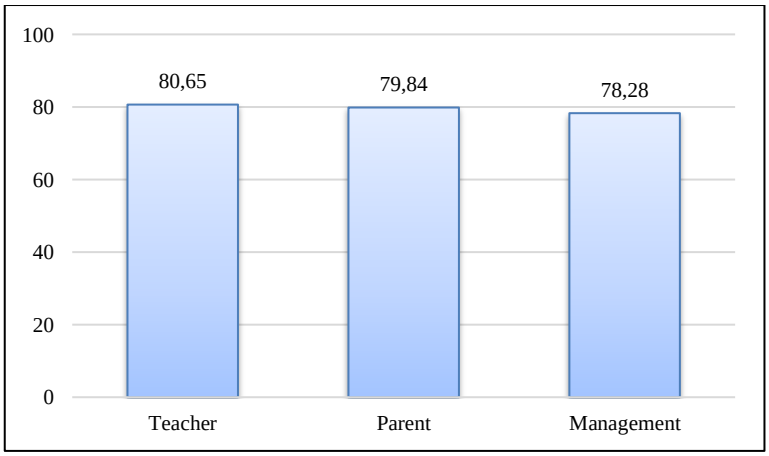

Figure 4. Comparison of responses from teachers, guardians of students, and the management of the Islamic boarding school regarding the practicality assessment.

4. CONCLUSION

The growth in the quantity of Islamic boarding schools is caused by one of the advantages of the tahfidz program. This requires an increase in the quality of tahfidz learning in the Islamic boarding school. In its implementation, the process of recording the progress of students' memorization is constrained by the complexity encountered during the recording process. This study presents a tahfidz monitoring instrument that integrates the devices owned by the boarding school, both teachers and boarding school management, with the devices owned by the guardians of students. This instrument has been declared valid by experts with an Aiken's V value of 0.81 so that it is worthy of being tested at the implementation stage. The implementation of the implementation produces a practicality value as a response from teachers, guardians of students, and boarding school management. The practicality value is 80.65% from teachers, 79.84 from guardians of students, and 78.28% from boarding school management. Overall, both teachers, guardians of students, and boarding school management stated that this integrated tahfidz monitoring instrument is practical during use.

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