

APPLICATION OF ADAPTIVE LEARNING TO IMPROVE THE QUALITY OF READING AND MEMORIZATION OF THE QUR'AN AT SMP TAFIHZHUL QUR'AN

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Abstract:

This study is motivated by the importance of the quality of Qur'anic recitation and memorization among students at SMP Tahfizhul Qur'an, particularly in facing diverse learning challenges. Although educational technology is increasingly recognized for its benefits in supporting the Qur'an memorization process, there is a research gap regarding the most effective methods, especially those that consider individual differences among students. This study aims to identify and test adaptive learning methods supported by technology to improve the quality of students' recitation and memorization. The research employs a descriptive case study with a qualitative approach, involving direct observation, in-depth interviews, and data analysis using Atlas.ti version 9 software. The results show that the adaptive approach, tailored to the individual abilities and needs of students, is more effective than traditional teaching methods. This study significantly impacts the practice of tahfizh education by informing more responsive educational practices that cater to individual student differences, while also offering a more inclusive and technology-based teaching model.

Keywords: *adaptive learning, Qur'an memorization, recitation quality, personalized approach.*

INTRODUCTION

The learning of tahfizh Al-Qur'an, especially in the context of secondary education, plays an important role in the formation of students' character and spirituality. In Islamic education, memorizing the Qur'an is not just a cognitive activity, but also a process of internalizing deep spiritual values (Rahman, 2021). The ability to read and memorize the Qur'an well is considered the main foundation for moral and ethical development in students' daily lives. Therefore, efforts to improve the quality of reading and memorization of the Qur'an among students are one of the priorities in Islamic education in various educational institutions, including at Tahfizhul Qur'an Al Matin Junior High School, Sukaraja Regency.

In the process of learning tahfizh, effective teaching methods are the main key to achieving optimal results. As revealed by Hasanah (2022), the quality of good teaching does not only depend on the intellectual ability of teachers, but also on an approach that is tailored to the individual needs of students. At Tahfizhul Qur'an Al Matin Junior High School, the teaching approach is focused on students' ability to read fluently and memorize correctly, but in its implementation, teachers are often faced with challenges in accommodating differences in abilities between students (Hasanah, 2022). Therefore, a more personalized and adaptive approach is needed to ensure that all students can achieve the expected standards.

Furthermore, the quality of reading and memorizing the Qur'an is also influenced by various external factors, including the learning environment and support from family and society (Mulyadi, 2023). Recent research by Mulyadi (2023) emphasizes the importance of a conducive environment and strong support from parents in the tahfizh learning process. In this context, SMP Tahfizhul Qur'an Al Matin has tried to create a supportive environment, but there are still challenges in providing the right approach to students with diverse abilities. This challenge shows the need for innovation in teaching methods that can increase the effectiveness of the teaching and learning process, especially in terms of improving the quality of reading and memorization of the Qur'an.

Although many studies have been conducted in the field of tahfizh learning, there is a significant gap regarding the most effective methods in improving the quality of reading and memorization of students with diverse abilities. Most previous studies have tended to focus on general teaching methods, without taking into account the individual needs of diverse students (Anwar, 2021; Firdaus, 2022). Existing research often ignores the fact that each student has a different learning speed and learning style, which has a great influence on the effectiveness of tahfizh learning. As a result, a uniform approach to teaching tahfizh often does not provide optimal results, especially for students who have difficulty memorizing or reading fluently.

In addition, there is an inconsistency in the results of research regarding the effectiveness of certain methods in learning tahfizh. For example, several studies show that traditional memorization methods are still predominantly used and considered effective (Azizah, 2023; Lubis, 2021). However, other studies show that this method is not always effective, especially for students with cognitive limitations or who need more support in the learning process (Sulaiman, 2022). This inconsistency has caused controversy among practitioners and academics, so more research is needed to clarify and identify methods that are truly effective for different types of students.

This controversy is further exacerbated by the lack of in-depth research on the application of technology in the tahfizh teaching process. Although technology has been recognized as a potential tool in improving teaching effectiveness, its application in the context of tahfizh learning is still limited (Ibrahim, 2023; Rahim, 2022). Some studies suggest the use of technology such as Qur'an memorization applications or data analysis software to identify students' learning needs more precisely (Ismail, 2021). However, empirical research that tests the effectiveness of this technology-based approach is still minimal, creating gaps in the literature that need to be filled through more comprehensive research.

One of the proposed solutions to overcome challenges in tahfizh learning is the application of an adaptive learning model that is tailored to the individual needs of students. Adaptive learning has been known in various educational contexts as an effective approach in dealing with differences in learning abilities (Hassan, 2022). In the context of tahfizh, this model allows for more personalized and directed teaching, where teachers can adjust teaching strategies based on each student's ability, learning speed, and specific needs (Rahman, 2021). Thus, this approach is expected to be able to overcome various limitations that exist in traditional teaching methods that are one size fits all.

The application of technology is an important element in supporting this adaptive learning model. The use of software and applications designed specifically for tahfizh learning allows for more accurate evaluation of student progress, as well as providing timely and specific feedback (Iskandar, 2023). In addition, technology can help identify areas that need more attention and adjust teaching materials according to individual needs (Yusuf, 2022). Several studies have shown that the use of technology-based applications can improve student motivation and learning outcomes, especially in the context of memorizing the Qur'an (Farid, 2021; Nurhayati, 2022).

The novelty of this research lies in the exploration and application of technology in tahfizh learning in a more in-depth and systematic manner. Although several studies have

addressed the benefits of technology in education, this study offers a more integrated approach by combining the principles of adaptive pedagogy with current technology (Alim, 2023). This research also explores various digital tools and platforms that have not been widely used in tahfizh learning, thus making a significant contribution to literature in this field. Thus, this research not only fills the gap in previous research, but also offers innovative and technology-based solutions to the challenges faced in tahfizh learning (Setiawan, 2023).

In the last decade, the literature on tahfizh learning has grown rapidly, especially with the emergence of new approaches that combine technology and adaptive pedagogy. Research by Ali and Ahmad (2023) highlights how digital technology has changed the landscape of tahfizh education, by introducing more interactive and user-friendly learning tools. Technology such as mobile apps and e-learning platforms not only enrich the student learning experience, but also enable more personalized and flexible teaching, which significantly improves student learning outcomes (Ali & Ahmad, 2023). Additionally, research shows that technology can speed up the memorization process and strengthen students' memory through structured and directed repetition features (Hassan et al., 2022).

The adaptive pedagogical approach has also received attention in the current literature. A study conducted by Yusuf (2021) underscores the importance of adapting teaching methods according to students' individual abilities in tahfizh education. Yusuf stated that personalized learning, by utilizing data analysis to identify students' learning needs, can improve the effectiveness of overall teaching (Yusuf, 2021). This research is supported by the findings of Rahim (2022), which found that students who followed adaptive learning methods showed significant improvements in their reading and memorization quality compared to students who learned using traditional methods. This literature emphasizes that teaching tailored to individual needs not only improves academic outcomes, but also increases student learning satisfaction (Rahim, 2022).

In addition to adaptive technology and pedagogy, the latest literature also explores various other innovative methods applied in tahfizh learning. For example, research by Nurdin (2023) shows that a collaborative approach, in which students learn in small groups with teacher guidance, can speed up the process of memorizing the Qur'an. This method allows students to help each other and provide feedback, which is very effective in reinforcing memorization (Nurdin, 2023). Another study by Firdaus and Zain (2023) discusses the use of gamification in tahfizh learning, which turns out to increase student motivation and make the learning process more interesting (Firdaus & Zain, 2023). This literature shows that innovations in teaching methods can significantly improve the

quality of tahfizh education, by providing a more effective alternative compared to conventional approaches.

METHOD

This study aims to examine the reality of the quality of reading and memorization of students at Tahfizhul Qur'an Al Matin Junior High School, Sukaraja Regency. The method used in this study is a descriptive case study with a qualitative approach. The research was conducted from January 3, 2024 to April 26, 2024 at the location of Tahfizhul Qur'an Al Matin Junior High School, Sukaraja. The research subjects consisted of one principal, one teacher, and one student. The presence of researchers during the research process is very important to dig up information directly from the informants through observation, in-depth interviews, and documentation studies. The location and duration of the study have been adjusted to the need to obtain valid and representative data.

The instruments used in data collection include observation and interview guidelines that are systematically developed based on research objectives. The data obtained through direct observation in the classroom and interviews with teachers and students were then analyzed using the Miles and Huberman qualitative data analysis method. In this analysis process, researchers used Atlas.ti version 9 software to digitally reduce the data, select the most relevant data, and present it in the form of an easy-to-understand narrative. The data reduction process was carried out with great care to ensure that only accurate and relevant data was used in this study.

Data validation is carried out through several steps to ensure the validity of the research results. Credibility tests are carried out by triangulation techniques and source triangulation, which involves comparing data from different sources and different data collection methods. Transferability is tested by documenting the research process in detail so that the findings of the study can be applied to other similar contexts. Dependability is maintained by conducting detailed documentation of all stages of the research, including methods and changes that occur during the research. Confirmability is tested by requesting assessments from experts in the field of Qur'an learning to ensure that the research findings are in accordance with accepted standards.

RESULTS AND DISCUSSION

A. Research Results

The Reality of the Quality of Reading and Memorization of Junior High School Students of Tahfizhul Qur'an Al-Matin Sukaraja Sukabumi

1. Fashih and Tartil Recitation

Based on the interview with mapel teacher Ustadzah Kholisoh Fawziyya (KF), the researcher got an answer about the reality of the quality of reading and memorization of students of Tahfizhul Qur'an Junior High School Sukaraja Sukabumi Regency is classified as good, tartil, fluent and worthy of participating in the tahfizh program learning. Although there are still some students who are left behind due to low IQs, he said:

"Globally, the quality of Qur'an reading in grades 8 and 9 of Al-Matin Junior High School is already good from the level of fluency and deserves to continue learning to memorize the Qur'an (entering the tahfidz class), although there are still one or two students who must have more or extra handling"

In line with the answer of the mapel teacher, it turns out that the coordinator of Al-Qur'an development, Mr. Fauzan Akbar (FA) stated the same thing, namely:

Fa: "that the quality of students' reading of the Qur'an is already good, in terms of fluency, tartil, and also fluency. Furthermore, he said that he was qualified if he entered the tahfizh class, but usually it was grades 8 and 9, then the researcher asked about the smooth condition? He said: I don't know if I think it's true, but if the championship competition continues heee....."

The interview with one of the ninth grade students who has been studying tahsin and tahfizh for almost three years is:

Ashfa Amira Alifa apparently admitted that "the reality of tahsin and tahfizh in Chinese junior high school is on average good according to the tajweed (while her cheerful face shows satisfaction)"

Interviews stated by mapel teachers, coordinators of Al-Qur'an development and students, the reality of the quality of reading and memorization of the Qur'an at Al-Matin Sukaraja Sukabumi Junior High School was generally achieved well in terms of its easih and tartil.

The results of the observations made by the researcher in grades eight and nine showed that the reality of the quality of reading and memorization was quite good from the practice of reading and memorization. Ustadzah KF, who was in grade 8 at the time, gave the researcher the opportunity to listen to the readings of class 8A students and get reading results that were already good and did not stutter. At that time, Ustadzah KF went around to each bench while reminding that all students would try to be able and have enough time to be able to talk to

researchers, students were enthusiastic to hear it. However, in class 8A, students are still found who still have to study with *the guidance of qir'ati* books or others related to low IQ.

In line with the results of interviews with mapel teachers, Al-Qur'an coordinators and students as well as the results of the researcher's observations, this can be corroborated by a documentation study in the form of photos of activities. So that the researcher can conclude that:

- a. The reality of the quality of reading and memorization of students is generally fluent and tartil
- b. In accordance with the rules of Tajweed
- c. Worth continuing to the memorization stage

2. Accuracy of Makhoriul Letters

The next discovery obtained by the researcher is the reality of reading and memorizing the makhofijul letters, namely the accuracy in the pronunciation of the letters. Based on the results of interviews with mapel teachers and also the coordinator of Al-Qur'an development, there is a common opinion, but with the addition of the subject teacher, Ustad FA added:

"You can say that the average makhoriul of letters in eighth and ninth grade students, Alhamdulillah, the accuracy of the makhoriul of the letters is in accordance with the rules, it is pleasant to hear."

A little different from the maple teacher, Ustadzah Kf stated:

The makhoriul letters are quite good, but if you still want to try to improve it again, it will be more satisfying because in makhoriul the letters must be visible to each letter how the mahroj, shifat (while manggut manggut)" An interview with one of the students turned out that students learning makhoriul letters on average said it was difficult"

It is adjusted to the results of the researcher when observing directly in the field that the reality of makhoriul letters at TQ Al-Matin Junior High School is indeed feasible, according to the rules and pleasant to hear. So the students there are worthy of being encouraged to continue the next stage of learning, namely learning tahfizh or ngaji *bil ghoib*. It can be understood that Ustadzah KF emphasizes that students should not only understand how to understand the meaning of makhoriul letters, but students must master how to read according to the accuracy of the correct makhoriul letters. Ustadzah KF said that the reading must be tartil and slow so that it can be seen in each letter which comes out of the throat, from the tip of the tongue and so on. In this case, the researcher obtained

documentation data from maple teachers and the results of observations in the field. Based on the results of the data collected, the author obtained evidence that SMP TQ Al-Matin has emphasized to students to properly use the makhorijul letters in their reading and memorization. The researcher concluded that TQ Junior High School students in their Qur'an readings have appropriately used their letter makhorijul correctly in the Qur'an reading, which has a quite positive impact on students.

3. Smooth and Clear

In the reality of reading and memorization, when the researcher interviewed mapel teacher Ustadzah KF, he said:

"Students at SMP TQ Al-Matin read and memorize quite fluently and clearly, but not all students because there are still students who have not made a loud sound when depositing or sima'an. Even though it is known that if you memorize yourself, you want to speak loudly, but when the vote is deposited softly, maybe the student is nervous, especially if the system of trapping verse fragments like MHQ is sometimes difficult (while smiling)"

Continued by the coordinator when interviewed by the researcher, he replied:

"If it's a problem, I'm sorry, my mother doesn't know everything, what I often know is only some of the time when students have group sima'an activities outside the classroom such as on the school terrace or in the school environment"

The researcher also asked students about fluency in reading and memorization. Nabila Putri replied nervously:

"If the sima'an is smooth, God willing, but sometimes if the Ustadzah is trapped, sometimes something is not answered. Even though it is more difficult than what is read with the ustadzah, but it is more difficult than sima'an is more delicious, for example, reading one juz or how much, it is smoother"

From the results of the interview, the researcher combined with the results of observation and was correct what was mentioned by the maple teacher, and also Nabila that there were still a small number of students who did not seem to want to read aloud or aloud at the time of deposit because there was a feeling of nervousness. Ustadzh KF never gets tired of guiding students to recite in a loud

voice, opening the mouth according to the letters and harokat repeatedly. This is done every day by Ustadzah KF, said one of the students (Nabila). Furthermore, it was corroborated by the documentation study that the researcher obtained in the form of a video.

Table 1 Results of Observation of the Reality of Reading and Memorization Quality

	The main problem		Description
1	The reality of the quality of reading and memorization of students of Tahfizhul Qur'an Al-Matin Sukaraja Sukabumi Junior High School	Easih and Tartil readings	Interviews with mapel teachers and Al-Qur'an development coordinators show that the quality of reading and memorizing the Qur'an at Tahfizhul Qur'an Al-Matin Junior High School is good. Students in grades 8 and 9 have achieved adequate standards of fluency and tartil. This was also strengthened by the testimony of one of the students. Although there are still some students who need extra attention, the overall learning of tahsin and tahfizh at the school is worth continuing.
		Accuracy of the letter makhorijul	Students at Tahfizhul Qur'an Al-Matin Sukaraja Junior High School have achieved accuracy in the pronunciation of the Qur'anic letters. Although there is a slight difference in assessment between the mapel teacher and the coordinator of the Qur'anic development, both agree that the students have achieved good standards. Ustadzah KF emphasized the importance of proper reading in a tartil and slow manner, while Ustadz Fauzan Akbar stated that eighth and ninth grade

	The main problem		Description
			students in general have reached an adequate level. In conclusion, tahsin and tahfizh learning at Tahfizhul Qur'an Al-Matin Sukaraja Junior High School has ensured that students are able to pronounce the letters of the Qur'an correctly, which has a positive impact on their abilities.
		Smooth and Clear.	Interviews with maple teachers and students showed that most of the students at Tahfizhul Qur'an Al-Matin Sukaraja Junior High School had quite fluent and clear reading and memorization. However, there are still some students who have difficulty in making a loud voice when depositing. Maple teacher, Ustadzah KF, continues to encourage students to read in a clear and fluent voice, while paying special attention to students who experience nervousness. In conclusion, in learning Tahsin and Tahfizh Al-Qur'an, students are required to read aloud clearly and fluently, with teachers placing a strong emphasis on reading aloud and fluently.

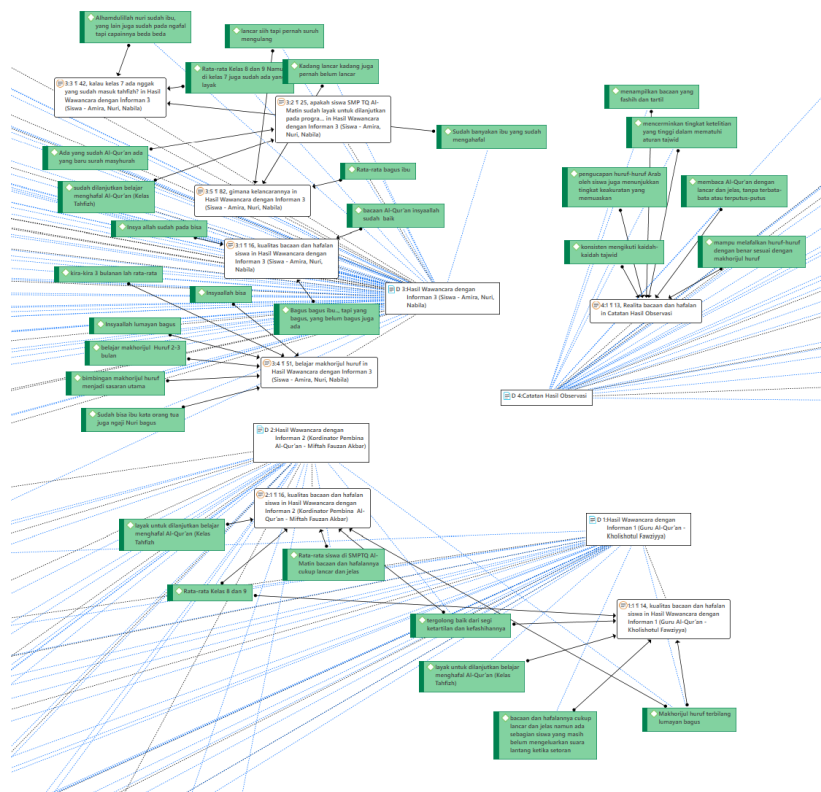


Figure 1 Network of coding reality indicators of reading and memorization quality of students of TQ Al-Matin Sukaraja Sukabumi Junior High School (source: Atlas.ti 9)

In the figure above, a lot of coding data from various informants, both teachers and students is shown along with the results of observations in the field. The screenshot above is the entire data (interviews and observations) related to "the reality of the reading and memorization quality of students of Al-Matin Junior High School" collected from all research instruments. In other words, *coding* from Atlas.ti provides reinforcement of findings in the field so that the data results become more real and valid.

Based on the data that the researcher has collected and strengthened the *coding* above, it can be concluded that the average student in grades 8 and 9 in learning tahsin and tahfidz with a clear and fluent voice in order to become fluent and tartil. In addition, it is also required to read the Qur'an lesan must be wide open so that it is in accordance with the conditions of harokat and letters by applying the three M's (*monyong, mangap, mecece*) so that the makharijul of the letters is read perfectly.

B. DISCUSSION

The Reality of the Quality of Reading and Memorization of Junior High School Students of Tahfizhul Qur'an Al-Matin Sukaraja Sukabumi

1. Fashih and Tartil Recitation

The reality of the quality of reading and memorizing the Qur'an for students of SMP TQ Al-Matin Sukaraja Sukabumi is quite proud because it has achieved a minimum level of collective success, namely fashih and tartil. The word fashih or in Arabic الفصاحة Fashahah means light or clear. Reading is said to be eloquent if the sentence is pronounced clearly, the meaning is clear and the arrangement is good (Tillah et al., 2024).

While the term tartil is mentioned in QS. Muzammil: 4 which is interpreted that the word tartil means quiet and tadabbur reading, with a standard level of speed, so that the reader can maximize the fulfillment of each reading law and the properties of the letters outlined. So that easih and tartil mean the recitation of the Qur'an which is spoken clearly and clearly and read calmly following the rules of tajweed and makhorijul letters. The fulfillment of eloquent and tartil readings concerns the fulfillment of the rights that must be exercised by readers when reading the verses of the Qur'an (Hasan, 2010).

Based on the results of the research, in general, the students of TQ Al-Matin Junior High School, in addition to memorizing, have been able to read the Qur'an properly and correctly according to the expected Arabic grammar rules. So that the reality of the quality of reading and memorization is more or less as mentioned earlier. When reading the verses of the Qur'an, it is done calmly, not in a hurry, so that the laws of tajweed are fulfilled and the makhorijul of the letters is read clearly and clearly. This is in accordance with the proper application of tajweed rules can improve recital understanding and skills among non-Arab learners, which is in line with the results of this study (Alsheikh and Shaheen, 2020).

Based on the results of interviews with various respondents, it was also agreed that the quality of the Qur'an reading of grade 8 and 9 students was "good" in terms of artifact, fluency means that it is worthy of listening because it is in accordance with the rules of tajwid. If detailed, the quality they provide is more than enough, although not to the same level as the level of professional reciters. The eloquence and artifact here include the law of tajweed, shifat of letters and makhorijul of letters. This is in accordance with the opinion of Abu Aswad Ad-Dualiy who stated that the learning of tahsin and tahfizh of the Qur'an emphasizes the importance of artificiality, eloquence, and fluency in the reading of the Qur'an (Rusydi, 2024).

2. Accuracy of Makhorijul Letters

The accuracy of the makhorijul actually has a continuity from the fulfillment of the eloquent reading of the Qur'an. Because Ibn Atsir is of the opinion that fashih or fashahah is specifically related to the word not meaning. He said: "eloquent kalam is visible and clear", which means that the words can be understood, so that no other explanation and understanding from other grammar books is needed. This is because the words are arranged according to the rules in the area of their speech, where they are arranged in the area of speech related to the goodness of the word and the goodness of the word can be found in hearing. Something that can be found by listening is lafadz, because it is a sound composed of makharijul khuruf.

So it can be correlated that fluent readings are created from letters that are spoken according to the rules of makhorijul of the letters perfectly. The provisions of makhorijul letters that are considered worthy of hearing as the quality of reading and memorization of students of SMP TQ Al-Matin Sukaraja Sukabumi in terms of this research include: 1) makharijul letters, namely prociting letters according to the place where each hijaiyyah letter comes out from the human speech apparatus 2) the properties of letters, namely pronouncing letters according to the properties of each hijaiyyah such as jahr, syiddah, lthbaq, Isti'la and others.

Thus, it can be concluded that students have been able to adequately master the accuracy of the letters, which is an important step in the learning process. is also reflected in the quality of reading of TQ Al-Matin Junior High School students which is in line with the rules of makharijul letters which emphasizes that accuracy in makharijul letters is the essence of eloquent reading Ismail and (Anwar, 2019).

3. Smooth and Clear

In terms of fluency and clarity of reading and memorization of students at SMP TQ Al-Matin has been considered to meet a fairly good level because it includes: 1) fluency, that students are able to read the Qur'an without obstacles and without many errors. Likewise in proving his memorization by reading it without seeing the Qur'an writings and also not forgetting much. As the rule of fluency and clarity in memorization is as Alwi said in his large dictionary that memorization means being able to pronounce outside of the head without looking at books and other notes (Zuhdi et al., 2024). 2).

Clarity, in reading fluently, that is, saying it or prociting it, the letters are clearly heard, the law of tajweed is heard both from the length, the short, and also the shifat, and the qolqolah. In accordance with the meaning of tahshin (language) is to improve while in terms it is to read the Qur'an correctly as read by the Prophet and

his companions. By removing letters from their makhraj, fulfilling their nature and paying attention to the law of reading.

Overall, fluency and clarity in memorization as described by (Muhammad and Kadir, 2021) show that students who are able to recite the Qur'an fluently and clearly have a solid foundation to maintain their memorization in the long term.

CONCLUSION

The conclusion of the study showed that the quality of reading and memorization of students at Tahfizhul Qur'an Al Matin Sukaraja Junior High School, Sukabumi Regency was generally good, especially in the aspects of literacy and fluency, and was worthy of continuing to the tahfizh class. However, there are some students who need extra attention due to intellectual limitations. These findings reinforce previous research that states that the quality of Qur'an learning in tahfizh schools can vary depending on internal factors of students.

Theoretically, the results of this study support the importance of a more personalized approach in learning tahfizh Al-Qur'an, especially in dealing with students with different abilities. This personalized approach not only helps students with slower abilities to catch up, but it also allows faster students to continue to improve without feeling hampered by the slower pace of learning. It also implies the need for further development in teaching methods that can be adapted to individual needs, such as the use of adaptive technology, project-based learning strategies, and more flexible evaluation methods. By ensuring that each student receives an education that suits their needs and abilities, this approach can help achieve optimal results and ensure that the learning process of memorizing the Qur'an becomes more effective and meaningful for each learner.

From the perspective of science development, these findings open up opportunities for further research in identifying effective strategies in improving the reading quality and memorization of diverse learners. This research also contributes to the Qur'anic educational literature, especially in the context of tahfizh schools, by emphasizing the importance of individual evaluation in the Qur'an teaching and learning process.

The development prospects of this research result involve the implementation of a more comprehensive adaptive learning model, where this approach not only focuses on students' intellectual ability to memorize the Qur'an, but also takes into account other equally important aspects such as motivation, psychological support, and students' emotional state. This holistic approach is expected to create a more supportive and

inclusive learning environment, where every student feels valued and supported in their learning process. Thus, the effectiveness of the tahfizh program can be significantly increased, as students are not only encouraged to memorize mechanically but also understand and love the learning process itself.

In addition, this research opens up opportunities for the development of a more flexible curriculum, which can be adapted to the individual needs and abilities of students. This kind of curriculum allows educational institutions to design more student-oriented programs, where learning can be tailored to each student's pace and learning style. The development of an adaptive curriculum also requires more intensive teacher training, which focuses not only on improving teaching skills technically, but also on developing the ability to recognize and respond to students' psychological and emotional needs. Teachers who have a deep understanding of the importance of an adaptive approach will be better prepared to face the challenges of teaching students of various skill levels, so that tahfizh programs can be implemented more effectively in various educational institutions.

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