

An Exploration of the Influence of Arithmetic Thinking Ability, Qur'anic Reading Fluency, and Learning Environment on the Quality of Juz 'Amma Memorization among PGMI UMALA Students

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Abstract

Memorizing the Qur'an is a tradition that dates back to the time of the Prophet. Over time, this trend has gradually entered the realm of formal education. The Qur'an is the only holy book memorized by tens of millions of people. The quality of memorization is influenced by various factors, such as arithmetic thinking ability. Arithmetic thinking skills can help *huffaẓ* (those who memorize the Qur'an) calculate how long it will take to complete their memorization if they recite a certain number of pages daily, or determine how many pages must be memorized per day to meet a specific yearly target. The second factor is fluency in reading the Qur'an. The fluency level of *huffaẓ* in reading the Qur'an also affects the quality of their memorization. Another important factor is the learning environment. This study aims to identify and examine empirical data regarding the influence of arithmetic thinking ability, Qur'anic reading fluency, and learning environment on the memorization quality of *Juz 'Amma* among PGMI UMALA students, both partially and simultaneously. The research sample consisted of 30 respondents from a total population of 236 PGMI UMALA students. Data collection methods included questionnaires, interviews, observations, and documentation. The analysis used was both statistical and descriptive.

INTRODUCTION

Memorizing the Qur'an has become increasingly popular among the Muslim community today (Annur, 2022). Several studies claim that the activity of memorizing the Qur'an can enhance intelligence, particularly spiritual intelligence (Lubis, 2020; Shofi Melania Romadloni, 2021). Various Qur'anic memorization movements have been initiated by community groups, such as *One Day One Juz* and the *Buah Tahfid* movement promoted by the *Jam'iyah Mudarasatil Qur'an lil Hafidhat* (JMQH).

The Qur'anic memorization movement has not only developed within the wider community but has also entered the realm of formal education. Many Islamic-based

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educational institutions have made Qur'anic memorization (tahfidz) a flagship program (Nurzannah & Ginting, 2022). Based on interviews with teachers and principals from nine public and private *Madrasah Ibtidaiyah* (MI) in the city of Metro, all of them have adopted tahfidz as one of their leading programs. This initiative is also supported by the Regional Office of the Ministry of Religious Affairs (Kanwil Kemenag) of Lampung Province, which has organized the *Musabaqah Tilawah dan Tahfizh Al-Qur'an Madrasah* (MT2QM) since 2021 as a platform for student development and motivation, particularly in the fields of recitation and memorization of the Qur'an.

Universitas Ma'arif Lampung (UMALA) offers 11 undergraduate study programs, one of which is the *Pendidikan Guru Madrasah Ibtidaiyah* (PGMI) or Elementary School Teacher Education. To meet market demands, the PGMI program at UMALA must prepare human resources who not only master pedagogical knowledge but also possess skills that support flagship programs such as Qur'anic memorization, which is currently being promoted in MIs across Metro City.

Referring to the results of the Tahfidz Test conducted by UMALA's *Unit Pengembangan Tahsin dan Tahfizh Al-Qur'an* (UPTTQ) for PGMI students in the academic year 2023-2024, it was found that 70% of students demonstrated strong memorization (*mutqin*) when continuing verses sequentially from a given surah. However, many students still struggled with recalling verses out of sequence for example, continuing a verse when only the surah number is mentioned or identifying the surah based on a verse. This indicates that there is still room for improvement in making their memorization more *mutqin* (precise and firm).

Several factors affect the memorization quality of students, including arithmetic thinking ability, Qur'anic reading fluency, and the learning environment. Arithmetic refers to the basic operations of numbers such as addition, subtraction, multiplication, and division (Ardani & Purwaningsih, 2018). Arithmetic thinking ability is the students' capacity to use arithmetic concepts as a means to solve problems. Qur'anic reading fluency is the reader's ability to recite with proper attention to the characteristics of the letters and correct tajweed (Ma'arif, 2009). The learning environment refers to the setting that influences changes in human behavior (Rita, 2010).

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The author presents several studies that have been conducted by other researchers to compare, strengthen arguments, and provide a broader perspective. The following references were used as the foundation for this research:

An article written by Nursuprianah in 2017 discusses mathematical modeling of the time span required for memorizing the Qur'an. The similarity between this reference and the author's research lies in the use of arithmetic thinking skills to calculate how long a student can complete their memorization based on the memorization program pattern set by the pesantren. The difference is that, in addition to using arithmetic concepts, this reference also applies linear regression modeling ($y = -5E-09x^2 + 0.166x + 0.084$, $R^2 = 0.999$) to determine the duration and quantity of memorization, considering the repetition process due to forgetfulness or other factors. The method used in this study is R&D, while the author's research uses a mixed-method approach with a sequential explanatory design.

The first relevant study by Nurfadhilah (2023) examines the relationship between Qur'anic memorization skills and problem-solving abilities in mathematics among 10th-grade female students at MAS Darul Hufazh. The similarity with the current study lies in the correlation and influence between mathematical ability and Qur'anic memorization ability, although the variable used in this research is specifically arithmetic thinking skills. The methodology also differs, where the reference used a correlation method with a quantitative approach, while this study uses a mixed-method approach with a sequential explanatory design.

The research by Irma Kania et al. (2024) focuses on the relationship between Qur'anic reading ability and the quality of Juz 30 memorization. The similarity with the author's study is in exploring the relationship between Qur'anic reading ability and the quality of Juz 30 memorization. However, the author's study includes additional independent variables: arithmetic thinking ability and the learning environment.

Farizal et al. (2022) examine the influence of the learning environment and pesantren regulations on Qur'anic memorization achievement among students at the Darul Qur'an Tahfizh Pesantren in Cipondoh, Tangerang. The similarity with the present study lies in discussing the influence of the learning environment on Qur'anic memorization performance or quality. Both studies employ a quantitative method with multiple linear regression analysis. The difference lies in the independent variables: the reference study includes pesantren

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regulations, while the author's research includes arithmetic thinking ability and Qur'anic reading fluency as independent variables.

Arithmetic Thinking refers to thinking related to calculating numbers using numerical operations (Rauzah, 2019). Arithmetic is limited to the computation of numbers and numerical values. Arithmetic thinking ability is a fundamental skill not only in mathematics but also in everyday decision-making that involves calculation and numerical analysis (Mahmud & Pratiwi, 2019). Components of arithmetic thinking ability include: a) Understanding Basic Mathematical Concepts . Understanding basic arithmetic operations (addition, subtraction, multiplication, and division) is the foundation of arithmetic thinking. It introduces mathematical symbols and how to apply these concepts in problem-solving (Salvia et al., 2022). b) Mental Calculation Skills. Mental calculation is a practice that helps individuals get used to solving problems without the aid of calculators or other tools. It requires speed, accuracy, and effective mental strategies, such as breaking down numbers or using mathematical properties to simplify problems (Hadi, 2015).

Reading is one of the essential elements in language skills that involves an active thinking process. This activity includes pronouncing sentences as well as understanding the meaning contained in the reading text, which is carried out by paying attention to the text and interpreting the written symbols within it (Harianto, 2020). The main foundation for an individual's academic achievement is reading fluency. Strategies to improve reading fluency through regular practice of word pronunciation can significantly enhance reading ability (Yasa, 2014).

Reading fluency includes activities such as reading books as well as the Qur'an. However, in Qur'anic reading, each individual has different levels of proficiency. This process requires diligence, patience, and support from an environment that encourages the development of these skills (Fajri et al., 2024). The learning environment encompasses factors that influence the student's learning process, including physical, social, emotional, and cultural aspects. For example, a study space with complete facilities, interaction with instructors, and motivation (Hermawan et al., 2020). The learning environment includes the family environment, school environment, and community environment (Sugianto, 2020). This plays a crucial role in either supporting or hindering learning achievements and skill

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development. A supportive and positive learning environment greatly contributes to academic success and personal growth, creating a conducive atmosphere for learning.

Based on the presented references, several research gaps are identified. Among them is the limited investigation into arithmetic thinking ability. Existing studies on arithmetic thinking tend to focus only on its relationship with algebraic thinking. The connection between arithmetic thinking ability and the quality of Juz 'Amma memorization has not been studied comprehensively, especially in conjunction with the other two variables: Qur'anic reading fluency and the learning environment. Therefore, to address this gap and to better understand the dynamics of arithmetic thinking ability, Qur'anic reading fluency, and the learning environment in relation to the quality of Juz 'Amma memorization among PGMI UMALA students, this research employs a mixed-methods approach.

METHOD

This study employs a mixed methods approach, integrating both qualitative and quantitative methods within a single research framework. The purpose of using mixed methods is to produce more accurate, valid, and comprehensive data. The research design used is sequential explanatory design, which is one type of mixed methods research where quantitative data is collected and analyzed first, followed by qualitative data to further explore the findings.

The population of this study consists of all students from the PGMI program at UMALA, totaling 236 students: 61 in the first semester, 68 in the third, 59 in the fifth, and 48 in the seventh semester (Mahmudah, 2024). The sample includes students who have completed the memorization of Juz Amma. The sampling technique used is purposive sampling. There are two types of variables in this research: independent and dependent. The independent variables include arithmetic thinking ability (X1), fluency in reading the Qur'an (X2), and the learning environment (X3), while the dependent variable is the quality of Juz Amma memorization (Y).

Data collection involves both quantitative and qualitative techniques. The quantitative techniques include tests and questionnaires. The tests consist of oral and written tests. The oral test is used to assess the quality of students' Qur'anic memorization based on the

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Musabqah Hifzhil Qur'an (MHQ) scoring system (Islam, 2018). The written test is used to measure students' arithmetic thinking skills. The questionnaire uses a Likert scale to gain insight into students' learning environments. The qualitative data collection techniques include interviews and observation. These are conducted simultaneously to gather information about students' memorization systems, the challenges they face, the obstacles encountered during the memorization process, and their strategies for maintaining memorization quality.

Quantitative data analysis uses multiple linear regression to determine the simultaneous effect of arithmetic thinking ability (X1), fluency in Qur'an reading (X2), and the learning environment (X3) on the quality of Juz Amma memorization. Validity and reliability instruments are assessed through content validity and Cronbach's Alpha. Qualitative data is analyzed using thematic analysis. The data validity techniques applied include triangulation and member checking. The integration of data in mixed methods is validated through cross-validation and convergent validity.

FINDINGS AND DISCUSSION

1. Quantitative Findings: No Statistically Significant Influence

Based on the results of the ANOVA test conducted in this study, the obtained significance value (sig) was greater than the predetermined alpha level (α). This outcome indicates that the null hypothesis (H_0) is accepted, meaning that there is no statistically significant influence either simultaneously or partially of the learning environment, arithmetic thinking ability, and fluency in reading the Qur'an on the quality of students' memorization.

Statistically, these three variables do not contribute significantly to the variation in students' memorization quality. This suggests that, although theoretically a supportive learning environment, numerical reasoning skills, and Qur'anic reading fluency may affect the memorization process, within the context of this study, these factors were not proven to be the primary determinants of memorization quality.

2. Qualitative Findings: Significant Role in the Initial Stages of Memorization

In contrast, the qualitative analysis conducted through in-depth interviews and direct observations revealed different findings. From a qualitative perspective, fluency in

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reading the Qur'an and the learning environment played a crucial role, particularly during the initial stages when students began memorizing *Juz Amma*. Fluency in recitation facilitated smoother verse repetition, while a calm, structured, and supportive learning environment provided significant psychological encouragement for students to maintain consistency in their memorization efforts.

These findings underscore that the roles of these two variables are more pronounced in the memorization process itself rather than in the final outcomes typically measured by quantitative methods.

3. Other Dominant Factors Identified in the Qualitative Analysis

Furthermore, the qualitative analysis uncovered several other factors that appeared to have a more dominant influence on students' memorization quality factors that were not captured by the quantitative approach. These include:

- a. **Intensity of Muroja'ah (Memorization Review):** Frequently identified as the key factor in maintaining memorization strength and preventing forgetfulness.
- b. **Peer Environment:** A positive social environment, including the presence of fellow students who are also memorizing or exhibit high academic motivation, encourages greater consistency.
- c. **Personal Motivation and Discipline:** A lack of motivation or internal discipline was found to be a major barrier to achieving high-quality memorization.

These factors are generally personal and contextual in nature, making them less suitable for measurement using conventional quantitative instruments.

4. Implications for Research Methods and Program Development Strategies

The divergence in findings between quantitative and qualitative approaches highlights the fact that the influence of certain variables in Islamic education especially in the context of *tahfidzul Qur'an* cannot always be fully understood through numerical data alone. Hence, adopting a **mixed-methods approach** is highly recommended to capture the complexity of students' experiences more comprehensively.

Practically, these findings provide valuable input for tahfidz program coordinators at the university level to consider non-academic factors such as emotional support, consistent *muroja'ah* routines, and the development of a healthy peer learning

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community as essential components of strategies aimed at improving the quality of memorization. Moreover, a reevaluation of existing instructional approaches is necessary to ensure that the methods employed are truly aligned with the students' real needs and learning contexts.



Figure 1. A picture of a PGMI student submitting Juz Amma to the Tahfidz mentor

Beyond the Image: The Deep Educational and Spiritual Meaning Behind a Peer Tutor Listening to a Student's Recitation at first glance, the image of a peer tutor attentively listening to a student's Qur'an recitation may appear simple an everyday scene within Islamic education environments. Yet beneath its surface lies a profound interplay of educational philosophy, spiritual mentorship, character formation, and the living transmission of sacred knowledge.

Pedagogical Significance: Cultivating Reflective Learning through Peer Mentoring from an educational standpoint, this image showcases an emerging but powerful method in Islamic pedagogy: peer tutoring. The presence of a student taking the role of listener or mentor reflects an active, student-centered learning model where responsibility for learning is shared, not solely top-down. It encourages accountability, reinforces the tutor's own understanding, and builds confidence in both roles.

The peer tutor is not simply "correcting" but engaging in a dialogic learning process a concept deeply rooted in Islamic scholarly tradition. This setting promotes mutual respect, patience, and a sense of educational brotherhood or sisterhood. For future educators, especially those studying in PGMI (Primary School Teacher Education) programs, this embodies a key pedagogical goal: developing teachers who learn to teach not only with knowledge, but with compassion and collaboration.

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Spiritual Practice: Internalizing Qur'anic Values through Listening to someone's recitation of the Qur'an is, in itself, an act of devotion. It aligns with the Qur'anic ethic of *sami'nā wa aṭa'nā* (we hear and we obey). For the peer tutor, the act of attentive listening becomes a spiritual exercise a moment to appreciate the divine words, to witness sincerity, and to offer support in a way that reflects *adab* (Islamic etiquette) and humility.

This dynamic one student reciting and another listening with full presence mirrors the classical *halaqah* (circle) traditions of Islamic learning, where transmission of knowledge was not merely about memorization but also moral formation. The peer tutor, though close in age and experience, adopts the position of *naqib* (guide), fostering not just correctness in pronunciation but also mindfulness in the act of memorization.

Social-Emotional Growth: Building Confidence, Discipline, and Community Psychologically, the relationship captured in this moment speaks to the emotional and social support systems so vital in religious education. The student reciting opens herself up to critique, correction, and guidance a vulnerable but transformative position. The peer tutor, in turn, embodies a trusted companion on the same journey, providing feedback with empathy and integrity.

Such interactions cultivate self-awareness, discipline, and humility. They help students embrace lifelong habits of *muhasabah* (self-evaluation) and *taqwā* (God-consciousness) traits that are indispensable for both spiritual development and effective teaching.

Symbol of Transformation: From Learner to Leader. This image can also be read as a representation of transformation. The student reciting is not only improving her memorization but preparing herself to become an educator who will one day guide children through similar processes. Meanwhile, the peer tutor is already stepping into a mentorship role an early rehearsal for future leadership in the classroom and the wider community.

Both students are involved in a dual process: refining their personal relationship with the Qur'an while shaping their professional identities. This process ensures that Qur'anic knowledge is not just carried in the mind, but embodied in daily practice and future pedagogy.

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Conclusion: A Living Tradition in Modern Context. In conclusion, this image captures far more than a moment of recitation. It reflects a deeply rooted Islamic educational tradition adapted to modern higher education one where students are nurtured as whole individuals: intellectually capable, spiritually grounded, and socially responsible.

By fostering peer mentorship in tahfidz programs, institutions are not merely facilitating memorization they are cultivating the next generation of Muslim educators who are prepared to lead with integrity, teach with empathy, and transmit divine knowledge with sincerity. The seemingly quiet moment between two students becomes, in truth, a dynamic site of transformation, tradition, and transcendence.



Figure 2. An image of a peer tutor attentively listening to a student's recitation

Linking the Journey: From Mentor Submission to Peer Support in Qur'anic Memorization. The two images the PGMI student formally submitting her memorization to a Tahfidz mentor, and the peer tutor attentively listening to a fellow student's Qur'anic recitation though different in structure, are deeply interconnected in purpose and educational philosophy. Together, they portray a holistic system of Islamic learning that is both vertical and horizontal in nature: vertical in its deference to teachers and mentors, and horizontal in its cultivation of peer-to-peer learning and mutual growth.

In the formal setting, the student engages in accountability to authority submitting her efforts to a recognized mentor who symbolizes scholarly oversight, ethical formation, and spiritual guardianship. This act represents a culminating moment in the student's memorization journey, signifying discipline, internalization of

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the sacred text, and recognition of scholarly validation. It affirms that the process of *tahfidz* is not merely a cognitive task but a deeply personal and spiritual milestone.

However, this process does not occur in isolation. Leading up to that submission are dozens if not hundreds of smaller, collaborative moments where students depend on one another for support, feedback, and motivation. This is where the peer tutor becomes indispensable. The image of a peer tutor listening to a recitation is not a separate phenomenon, but rather a complementary and preparatory step that strengthens the student before facing the formal evaluation by a mentor.

Peer tutoring functions as a training ground for character, where students rehearse not only their verses but also virtues such as humility, patience, discipline, and responsibility. These moments reflect the hidden scaffolding of the *tahfidz* process those informal networks of support that sustain memorization practices when formal sessions have ended.

In essence, the peer and the mentor serve two sides of the same educational coin: one nurtures confidence, the other affirms quality; one walks beside the student, the other leads from ahead; one builds resilience through familiarity, the other pushes excellence through structured feedback.

Moreover, both roles are essential in preparing PGMI students not only to become competent teachers of Islamic knowledge but also transformative role models who are capable of integrating Qur'anic values into their pedagogical practices. This dual structure grounded in communal learning and guided mentorship reflects the educational vision of Islamic higher education that seeks to balance academic proficiency, spiritual depth, and social responsibility.

Conclusion: A Continuum of Growth and Guidance

Taken together, the two scenes formal submission to a mentor and attentive listening by a peer form a rich educational continuum that exemplifies the philosophy of *tarbiyah islamiyyah* (Islamic nurturing). They showcase how Qur'anic memorization is embedded in layered social interactions, each contributing uniquely to the student's intellectual formation and spiritual maturity.

In this framework, students are not only bearers of memorized text but also active participants in a living tradition responsible for one another, accountable to

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mentors, and committed to embodying the Qur'an in both private devotion and public service.

CONCLUSION

Based on the results of the ANOVA test conducted in this study, the obtained significance value (sig) was greater than the predetermined alpha level (α). This indicates that the null hypothesis (H_0) is accepted. In other words, there is no statistically significant influence either simultaneously or partially of the learning environment, arithmetic thinking ability, and fluency in reading the Qur'an on the quality of students' memorization. This finding suggests that although these three variables may theoretically have some level of correlation, within the context of this study, they do not contribute significantly to the variation in students' memorization quality. This implies that other, unexamined factors may play a more dominant role such as personal motivation, the intensity of memorization practice, the methods used in tahfidz learning, or the presence of spiritual and emotional support from the surrounding environment. Therefore, these results can serve as valuable input for tahfidz program coordinators at the university level to explore other potentially more relevant aspects in improving students' memorization quality and to reevaluate the teaching approaches that have been implemented thus far.

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