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Relationship Between Big Five Personalities and Habit of Memorizing the Qur'an on Mathematics Learning Achievement through Mediator of Self-Regulated Learning

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Abstract

This study aims to determine the influence of the Big Five personalities and the habit of memorizing the Quran through self-regulated learning mediators on mathematics learning achievement. Next, examine the effect of exogenous variables on endogenous variables directly or indirectly. This study uses a quantitative approach, the measuring tools used are the big five personality scale, the habit of memorizing the Qur'an, self-regulated learning, and using documents of mathematics achievement scores for the 2019/2020 academic year. We used the following data analyses: 1) measurement models, 2) structural equation models, and 3) measurement models, which were calculated through confirmatory factor analysis (CFA) of latent research variables. This study's participants were 113 students from two junior high schools in Yogyakarta, Indonesia. They were in grade eight and had a minimum of 3.5 juz of memorization of the Quran. The research findings showed that memorizing the Quran and the Big Five personalities impacted mathematics learning achievement through self-regulated learning mediator variables. There is no significant correlation between the Big Five personality traits and math learning achievement. Similarly, the practice of memorizing the Quran also shows negligible impact. Nonetheless, there is a significant correlation between the four – conscientiousness, neuroticism, agreeableness, openness to new experiences, and the habit of memorizing the Quran through self-regulated learning mediators on mathematics learning achievement. An extroverted personality directly influences mathematics learning achievement. Lastly, a significant correlation exists between mathematics learning achievement and self-regulated learning.

INTRODUCTION

Government Regulation Number 57 of 2021 states that the National Education Standard is a minimum criterion regarding the education system in all jurisdictions of the Unitary State of the Republic of Indonesia. One of its aims is to educate the nation's life and realize quality and dignified national education (Kemesristek, 2021). This is also contained in the main goal of national development, which is to improve the quality of human resources continuously through enhancing the quality of education.

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Many countries strive to improve the life chances of their citizens by raising the average academic achievement of their children and offering access to high-quality education. In addition to comparing students' average achievement with economies comparable to one another, a thorough examination of the variables influencing student achievement variance and the underlying causes of achievement gaps can yield valuable insights for driving educational improvement. Students who struggle with basic arithmetic calculations or scientific principles may fall behind if fundamental mathematical learning is not provided early to lay the foundation for later years. Simultaneously, honing the abilities of students with talents in mathematics and science is equally important. Variations across different education systems were found to be positively associated with student achievement (Vrapi & Alia, 2022; Zheng et al., 2024).

The results of PISA 2022 show that Indonesia has improved in rank compared to PISA 2018, rising 5-6 places. Despite the increase in ranking, Indonesia experienced a decrease in scores in each of the subjects tested: reading, mathematics, and science. In reading, Indonesia obtained an average score of 359, down 12 points from the previous edition. In mathematics, Indonesia's average score fell 13 points to 366, and in science, Indonesia's average score dropped 13 points to 383 (Lubis, 2023). Collaborative problem solving is an essential 21st-century skill in social collaboration and cognitive problem solving, increasingly integrated into educational programs such as the Program for International Student Assessment (PISA).

This situation is ironic when mathematical skills are used as a benchmark for assessing Indonesia's readiness to face the industrial revolution 4.0. Despite being in science classes, students often struggle with basic operations such as addition, subtraction, multiplication, and division, as well as fractions, percentages, and decimals.

Research on improving educational system programs in Indonesia shows that students' ability to solve simple math problems does not significantly differ between new elementary school students and those who are secondary school graduates (Aminy et al., 2021; Pradhata & Muhid, 2021). Learning achievement is also considered the acquisition of student abilities manifested in learning outcomes. Previous research has shown low thinking skills, with one cause being the process of learning mathematics. Students are often taught to memorize, rewrite, and do exercises rather than being trained in higher-order thinking and solving relevant problems (Noor & Abadi, 2022). Some psychologists suggest that a drive to achieve high learning achievement is a form of positive desire to complete tasks and achieve success with high-quality standards (Holt et al., 2015).

Understanding the relationship between personality, self-regulated learning, and learning achievement is crucial in an educational context. Research variables in this article show that Big Five Personality factors such as neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Komarraju et al., 2011) are associated with better learning achievement. An individual's openness to new experiences and knowledge contributes to higher academic achievement. Research shows associative relationships between personality factors, self-regulation, and coping strategies. Neuroticism factors have a significant negative association with Self-Regulation both globally and in its factors (de la Fuente et al., 2020). Students who can organize themselves in learning tend to have better learning achievements (Barrera & Barrera, 2022; Zimmerman & Moylan, 2009). Personality and self-regulated learning (SRL) play important roles in influencing student achievement. The results indicate that the personality dimensions of conscientiousness and openness contribute to self-regulated learning, which in turn affects student achievement. Especially in mathematics, factors such as ability, enjoyment, and interest in the subject are seen as crucial for achieving success (Peteros et al., 2020).

Regarding the habitual behavior of memorizing the Qur'ān, it is known that the main task of a student is to learn. The portrait of student life is already dense with various schoolwork and extracurricular activities. If a student becomes a memorizer of the Qur'ān, they must also engage

in activities associated with memorizing the Qur'ān. Memorizing the Qur'ān for its virtues involves various methods. These factors include students' potential, talents, or intelligences, which according to Gardner, represent multiple intelligences and diversity (Khafidah et al., 2020). Despite the enthusiasm of students memorizing the Qur'ān, they still face challenges such as time management difficulties, often forgetting memorization, peer influence, and stress when unable to recall sentences. Students attempt to overcome these problems through self-motivation, self-control, and performing muroja'ah (Mahfuds et al., 2022).

Learning strategies based on self-regulated learning, according to Zimmerman and Martinez-Pons, involve internal and cognitive learning approaches. Their research shows a significant positive relationship between learning achievement and the use of self-regulation-based learning strategies (Zimmerman & Martinez-Pons, 1990; Purwanto, 2017). Empirical evidence indicates that students' expertise is high, but they cannot achieve maximum learning achievement due to a lack of self-regulation (Suherman et al., 2021). Self-regulated learning, which includes metacognition, motivation, and behavioral skills, is crucial for improving learning achievement (Zimmerman, 1989).

Problems can also arise from people who believe that memorizing the Qur'ān interferes with academic activities. However, memorizing the Qur'ān has been shown to positively affect the development of basic skills and improve academic achievement (Nasution, 2018). Based on this background, the research aims to explore the influence of Big Five personality traits and the habit of memorizing the Qur'ān through self-regulated learning on the math learning achievement of Integrated Islamic Junior High School (SMP IT) Yogyakarta students. The main research question is: Is there a significant influence of the Big Five personalities and the habit of memorizing the Qur'ān through self-regulated learning on the math learning achievement of SMP IT Yogyakarta students?

Hypotheses

The major hypothesis posits that the theoretical model of the influence of the Big Five personalities and the habit of reading the Qur'ān through self-regulated learning mediators on mathematics learning achievement fits according to empirical data. The minor hypotheses are as follows: (1) There is a significant influence of Qur'ān reading habits through self-regulated learning mediators on math learning achievement. (2) There is a significant effect of openness to experience through self-regulated learning mediators on mathematics learning achievement. (3) There is a significant effect of conscientiousness through self-regulated learning mediators on mathematics learning achievement. (4) There is a significant effect of extraversion through self-regulated learning mediators on mathematics learning achievement. (5) There is a significant effect of agreeableness through self-regulated learning mediators on mathematics learning achievement. (6) There is a significant effect of neuroticism through self-regulated learning mediators on mathematics learning achievement.

METHODS

Quantitative descriptive research, in this study, is explanatory research, which is research conducted to explain the influence between variables through testing formulated hypotheses (often called explanatory research) (Singarimbun, 2003). The approach used in this study is an approach based on statistical information to examine the influence of self-regulated learning variables, big five personalities, memorization habits of the Qur'ān on mathematical learning achievement. Based on the relationship between the variables described above, the conceptual framework in this study is contained in figure 1.

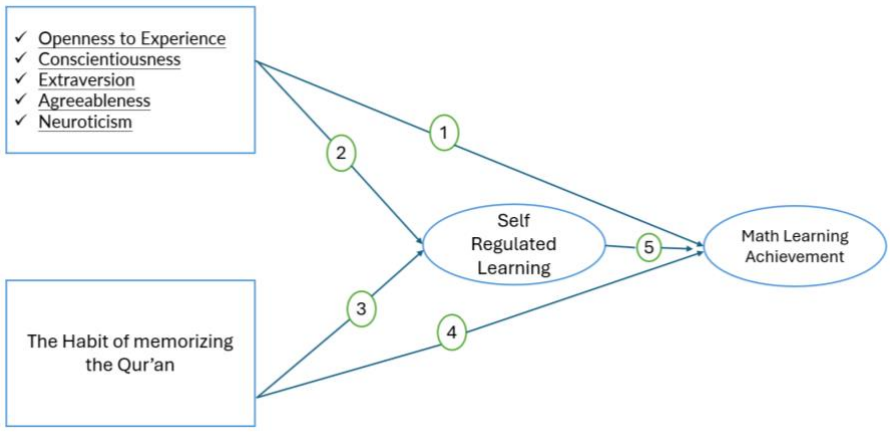

Figure 1: Research Framework of Mind

Information:

1. The direct influence of big five personalities on mathematics learning achievement.
2. The influence of big five personalities on math learning achievement mediated by self-regulated learning.
3. The influence of Qur'ān memorization habits on math learning achievement mediated by self-regulated learning.
4. The influence of memorization habits of the Qur'ān on mathematics learning achievement (Math Learning Achievement).
5. The direct effect of self-regulated learning on Mathematics Learning Achievement.

The subjects selected in this study were several students of the Integrated Islamic Junior High School (SMP IT). The reason the subjects of this study were students who memorized the Qur'an. Table 1 shows the distribution of research subjects

Table 1. Distribution of Research subjects (N = 113)

No	Nama SMP IT	Population	Gender		Sample
			Female	Male	
1	SMP IT LHI	164	20	23	43
2	SMP IT Salman al Farisi	135	37	33	70

Techniques for determining subjects in research that use purposive sampling techniques with certain considerations. The considerations used by researchers to determine the sample were SMP IT students in grades VII, VIII and IX who attended the Qur'an tahfiz class (Sugiyono, 2018).

Data Collection Methods and Instruments

The data collection method in this study used self-regulated learning scales, big five personalities, and Qur'ān memorization behavior in quantitative data collection. Considering that to measure the variables of student mathematics learning achievement, the data collection method used is documentation. The documentation method is one of the methods of collecting data using materials that exist or are available in certain files in the research environment. A set of data contains certain aspects or attributes that will be used as staple study material in this study (Martono, 2014).

Statistical data processing in this study using SEM AMOS version 22.0. The stages of SEM Analysis go through five stages, namely: 1). Model Specification, 2) Model Identification 3). Model Estimation, 4) Model Evaluation, 5). Model modification (Haryono, 2017). Data

validity is obtained in SEM processing in AMOS when looking at the value of the loading factor. A summary of the basis for determining validity can be seen in table 2:

Table 2. Summary of validity references

Parameter	Reference Value
Factor loading (λ)	Greater than 0.5
c.r	Greater than 0.5
Probability	Greater than 0.5

In addition, proofs of construct validity are performed, as well as construct reliability tests. This test is performed to demonstrate the accuracy, consistency and precision of the instrument. In the reliability of this study using the Alfa Cronbach technique (McNeish, 2022).

Criteria Goodness of Fit (GoF)

After testing the measurement model and structural model, it is testing the model in total model or total adjustment according to goodness of fit (GoF). GoF is an indication of comparison between the model that is specified and the covariance matrix between the observed indicators or variables. If the GoF is done well, then the model is acceptable and vice versa if the GoF occurs bad results, then the model must be rejected or modified the model (Ghazali &; Laten, 2015). Table 3 shows: Goodness of fit (GoF) criteria (Ghazali &; Laten, 2015; Haryono, 2017).

Table 3: Criterion goodness of fit (GoF)

Size Index Criteria	Mold Value
Chi-Square (2)	Probabilitas (P) > 0,05
CMIN/df	2,00
Root mean square error of approximation (RMSEA)	< 0,08
Comparative fit index (CFI)	> 0,9 (clouse to 1)
Parsimonious comparative fit index (PCFI)	> 0,6
Akaike information criteria (AIC)	AIC < AIC saturated model & independence model

Hypoplant Test

Based on the objectives of the study, a hypothesis test is carried out. The research hypothesis is accepted or rejected, then the hypothesis test is carried out. Hypothesis tests are performed using test rules manually tests. The test is carried out in two stages, that is, it tries the entire model and individual hypotheses.

In addition, to test the importance of influence between latent variables can be seen from the measurement model test or structural model presented earlier. To find out the magnitude of the effect of variables in other variables. Amos presents the influence of each variable summarized in direct effects, indirect effect and total effect. Table 4 shows the rules and interpretation of the fit model index (Gaskin &; Lim, 2016; Haryono, 2017; Hu & Bentler, 2009).

Table 4. Rules and interpretations of fit model indices

Index	Not Good	Good enough	Very good
CMIN/DF	> 5	> 3	> 1
CFI	<0.90	<0.95	>0.95
SRMR	>0.10	>0.08	<0.08
RMSEA	>0.08	>0.06	<0.06
PClose	<0.01	<0.05	>0.05

RESULTS AND DISCUSSION

Results

This study is to examine the influence of big five personalities, the habit of memorizing the Qur'ān through self-regulated learning mediator variables on mathematics learning achievement (MLA) at SMP IT Yogyakarta. The first major research hypothesis proposed by the influence of the big five personalities, the habit of memorizing the Qur'ān through self-regulated learning mediator variables on mathematics learning achievement (MLA) is fit meaning it is supported by empirical data. Figure 2 illustrates the Model fit mediation analysis test

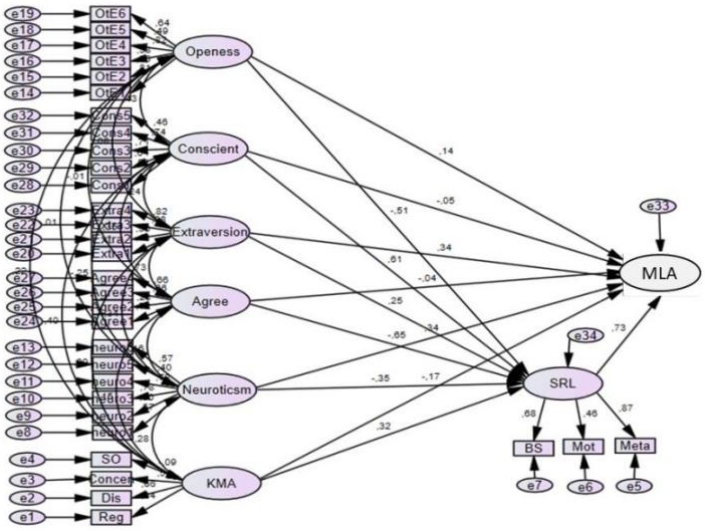

Figure 2. Model fit mediation analysis

Table 5. Model fit mediation analysis

Index	Value	criterion	Interpretation
CMIN	6,292	--	--
DF	1	--	--
CMIN/DF	6,292	between 1 and 3	Not Good
CFI	0,959	>0.95	Very Good
SRMR	0,037	<0.08	Very Good
RMSEA	0,217	<0.06	Very Good
PClose	0,025	>0.05	Good Enough

The results of data analysis in table 5 show that the proposed model does not meet some goodness of fit criteria, but some criteria can be met well. CFI > 0.95, SRMR < 0.08 meet the criteria very well, and PClose >0.01 is still within accepted tolerances as a measure of whether or not a model fits. Chi square with p< 0.05, CMIN/DF, and RMSEA show values below the criteria. Thus it can be said that the proposed Model is already in accordance with its hypothetical model.

The direct effect between the habit of memorizing the Qur'ān (KMA) and math learning achievement (MLA) of -0.035 with p > 0.05, shows that the results are not significant. However, with self-regulated learning (SRL) as moderator, it showed a significant effect of 0.417 with p < 0.01. This means that self-regulated learning is a good mediator for the habit of memorizing the Qur'ān in influencing mathematics learning achievement, where the influence of memorization habits of the Qur'ān on self-regulated learning is 0.215 with p < 0.05. Table 6 shows the coefficient influence between research variables.

Table 6. Coefficient Influence between Research variables

Efect		OtE	Consc	Extra	Agree	Neuro	KMA	SRL
SRL	Direct	-0,236**	0,461**	-0,062	-0,208*	-0,206*	-	-
MLA		-0,001	0,171	0,277*	-0,125	0,175	-0,067	0,391**
SRL	Indirect	-	-	-	-	-	-	-
MLA		-0,092	0,180	-0,024	-0,081	-0,080	-	-
SRL	Total	-0,236**	0,461**	-0,062	-0,208*	-0,206*	-	-
MLA		-0,093	0,351	0,252	-0,206	0,094	-0,067	0,391**

*significant with p<0.05
**significant with p<0.01

Discussion

Research Model and Relationship between Variables

Based on Table 6, the values of direct and indirect effects between variables can be seen. Direct effects are relationships between variables that are not mediated by other variables, while indirect effects are relationships between variables mediated by other variables.

In this study, the direct effect of extraversion on mathematics learning achievement is significant, with a correlation coefficient of 0.277 ($p < 0.01$). It can be said that extraversion affects mathematics learning achievement. Someone with a high extraversion factor will remember all social interactions and interact with more people compared to someone with a low level of extraversion. In interacting, they will also hold more control and intimacy. Their peer groups are also considered friendly, fun-loving, affectionate, and talkative. Based on the items that many students choose, these are related to sociability, friendly attitudes, and liking to hold emotions. There are three forms of value transmission: 1) parents; 2) teachers; and 3) peers. Peers (Berry et al., 2011) are influential because of the boarding culture, where they interact more with room or dormitory friends. Through this interaction, without realizing it, there is a positive learning process, namely the habit of memorizing the Quran.

One of the results revealed that personality traits were significantly associated with academic achievement. Gradual regression analysis showed personality characteristics accounted for 48 percent of the variation in academic achievement, one of which was extraversion (Hakimi et al., 2011). Another study mentioned that extraversion and openness were positively associated with elaborative processing of other personality traits, accounting for 14% of the variance in grade point average (Komarraju et al., 2011). The results of this study found that personality traits, particularly extraversion, have a significant peer influence on mathematics learning achievement. Research conducted by Rapallini et al. stated that peer influence is significant on mathematics achievement (Rapallini & Rustichini, 2019). Zhung's research results showed that extraversion of peer relationships has a significant positive effect on mathematics learning achievement, and academic motivation plays a mediating role between peer relationships and mathematical achievement (Baiduri, 2022; L. Li et al., 2020). High scores on this factor describe individuals who are sociable, active, talkative, and have good interpersonal relationships. According to Pervin and John's research results on extraversion, classrooms with a proportion of peers can increase higher educational achievement (T. Bongco & D. Ama, 2023).

The effect between self-regulated learning and math learning achievement is significant, with a correlation coefficient of 0.391 ($p < 0.01$). Thus, it can be said that self-regulated learning is a good mediator for the big five personalities. This means that the subject's personality affects their self-regulated learning, which then significantly affects their mathematics learning achievement.

One of the focuses of education is to develop independent learners. Self-directed learners are active learners who use knowledge and strategies to organize their learning adaptively and efficiently (Zimmerman, 2010; Zimmerman, 2002). Findings from intervention studies

establish that effective self-directed learning is associated with improved academic achievement (Schmitz & Wiese, 2006). It contributes to effective self-regulated learning interventions in mathematics in school-age learners. Math may be more challenging for students who experience a difficult transition from basic math to advanced math. Challenges in advanced mathematics curricula can lead to student failure, lack of interest in obtaining mathematical achievement, and adverse declines in the subsequent learning process in mathematics (Berger et al., 2015).

In the mathematical domain, Cleary et al. (2017) tested self-regulated learning interventions and found improvements in high school students' self-regulated learning and math achievement. Another research result (Rosário et al., 2013) indicated that the learning process with the use of self-regulated learning in students can increase mathematical achievement. Additionally, happy students can also improve their achievements, meaning that SRL can be introduced to happiness (Bahiroh et al., 2020). Prestigious students are also associated with those who have good character (Khaidir et al., 2020), including honesty (Suud et al., 2022). Being honest in one's own abilities and in SRL is crucial.

Self-regulated learning interventions are beneficial for improving learner performance in various academic domains. Empirical evidence suggests that self-regulated learning is associated with general academic performance. High-achieving students also reported using self-regulated learning strategies more often than low-performing students. This supports the idea that self-regulated learning strategies relate to academic achievement across academic domains and task contexts (Moos & Azevedo, 2008). Another study showed that students with high self-regulated learning had better mathematical connection skills than students with medium and low self-regulated learning. Students with moderate self-regulated learning have better mathematical connection skills than students with low self-regulated learning (Putri et al., 2018).

Big Five Personalities on Math Learning Achievement

The direct effect between the big five personality dimensions and math learning achievement (MLA) was insignificant at $p<0.05$, meaning that personality had no direct effect on MLA. Likewise, the habit of memorizing the Qur'an (KMA) also showed an insignificant correlation. This suggests that the big five personalities and memorization habits of the Qur'an are not the right predictors for MLA. However, there is a significant correlation between three big five personality dimensions, namely Openness to Experience (OtE), Agreeableness (Agree), and Conscientiousness (Consc) with self-regulated learning, with -0.522, -0.709, and 0.725 with $p<0.01$, respectively. The correlation between self-regulated learning and math learning achievement is significant, with a correlation coefficient of 0.624 ($p < 0.01$).

Another study examined the relationship between the Big Five personality model and the use of self-learning strategies. Measures of self-regulated learning strategies and big five personality traits were given to a number of college students. The study also compared the relative contributions of personality factors and self-study strategies in predicting academic achievement. Results from hierarchical multiple regression suggest that Intellect personality traits contribute independently to variance in student GPA, whereas regulatory efforts mediate the effects of conscientiousness and agreeableness (Bidjerano & Dai, 2017).

The effect between self-regulated learning and math learning achievement is significant, with a correlation coefficient of 0.391 ($p < 0.01$). Thus, it can be said that self-regulated learning is a good mediator for the big five personalities. This means that the subject's personality affects their self-regulated learning, which then significantly affects their mathematics learning achievement.

Other studies have shown that personality traits contribute independently to variance in student achievement, whereas self-regulated learning mediates the effects of conscientiousness

and agreeableness on student academic achievement (Bidjerano & Dai, 2007). Sorić, Penezić, & Burić explain through their research that goal orientation mediates conscientiousness and extraversion to predict academic achievement (Sorić et al., 2017). As for the big five personalities with self-regulated learning, there was a direct influence in this study.

The Habit of Memorizing the Qur'an, Self-Regulated Learning on Mathematics Learning Achievement

The direct effect between the habit of memorizing the Qur'an (KMA) and math learning achievement (MLA) of -0.035 with $p > 0.05$ shows that these results are not significant. However, with self-regulated learning (SRL) as a moderator, it showed a significant effect of 0.417 with $p < 0.01$. This means that self-regulated learning is a good mediator for the habit of reading the Qur'an in influencing mathematics learning achievement, where the influence of memorization habits of the Qur'an on self-regulated learning is 0.215 with $p < 0.05$.

Based on the psychology of cognitive development, each phase of cognitive development will correspond to a task of cognitive development. Memorization in cognitive processes is included in category C1, in other words, Low Order Thinking Skill (LOTS), which is the basic ability of the visible behavioral learning process: reading, naming, marking, memorizing, imitating, taking notes, and repeating. Meanwhile, learning mathematics for the junior high school level already requires Higher Order Thinking Skill (HOTS), which involves more specific higher-order thinking skills such as reasoning, analytical skills, problem-solving, and critical and creative thinking skills (Wawan & Pamungkas, 2021). Students often do not manage to master mathematical material, especially as the demands of mathematics at higher levels increase (Grønmo et al., 2015). However, with self-regulated learning as a moderator, it shows a significant effect of 0.417 with $p < 0.01$. This means that self-regulated learning is a good mediator for the habit of memorizing the Qur'an in influencing mathematics learning achievement, where the influence of memorization habits of the Qur'an on self-regulated learning is 0.215 with $p < 0.05$.

SRL interventions are beneficial for improving learner performance in various academic domains. Empirical evidence suggests that SRL is associated with academic performance in general. High-achieving students also reported using SRL strategies more often than low-performing students. This supports that SRL strategies are associated with academic achievement across academic domains and task contexts (Moos & Azevedo, 2008). Goal orientation fully mediates the relationship between students' personality traits and their academic achievement, but only for Conscientiousness (Sorić et al., 2017). In the foundation of its one-dimensional The theory of goal orientation suggests that students who memorize the Qur'ān aim for the following: 1) The memorization of the Qur'ān is always filled with various kinds of blessings; 2) The memorizers of the Qur'ān have peace of mind because they read the Qur'ān every day and always engage in remembrance; 3) Glory and high status in heaven, which depends on the amount of memorization; 4) Their parents will be glorified on the last day. These students have not been oriented towards academic achievement, especially in mathematics learning. Another study mentioned that perseverance of effort is closely related to motivation and achievement rather than consistency of interest for high school students (Muenks et al., 2018). Duckworth et al. define grit as a person's passion and perseverance toward long-term goals, consisting of two components: consistency of interest and perseverance (Duckworth et al., 2007). Perseverance of effort in students predicts their grades later. Other research on fortitude shows that perseverance predicts academic achievement positively (Szczęsniak et al., 2019).

The results of a study showed that trained students had higher abilities than their untrained counterparts in memory tasks. This memory also predicted higher levels of future performance, suggesting that their progress on other tasks had also improved (Gaskill & Murphy, 2004). In

many studies, working memory has been found to be a strong predictor of mathematical outcomes (Bos et al., 2013). A follow-up study investigated developmental changes in working memory and cognitive abilities, showing that similar differences between age, working memory, storage, and processing speed in both verbal and visuospatial domains contributed most to mathematical achievement (Bayliss et al., 2005; Y. Li & Geary, 2013).

Zimmerman stated that the application of self-regulated learning is effective in the special learning process (Zimmerman, 1998). The habit of memorizing the Qur'ān is considered special learning. Based on the results of this study, the habit of memorizing the Qur'ān, mediated by self-regulated learning, has a significant effect on mathematics learning achievement. Setting goals and planning indicates the student's plan to achieve educational goals or sub-goals and plans to sort priorities, determine time, and complete plans for all activities related to these goals. Environmental structuring shows students' efforts to arrange the learning environment to make learning more comfortable (both physically and psychologically). Repeating and remembering (rehearsing and memorizing) shows students' efforts to remember the subject matter (Zimmerman, 1989). There are four factors in individuals in terms of learning based on self-regulation, one of which is the goal to be achieved (Zimmerman, 2016).

Memorizing the Qur'ān is a precious treasure for sincere people because the Qur'ān is the word of God that can become sharia for its readers on the Day of Judgment (Kibtiyah et al., 2020). Memorizing the Qur'ān to gain its virtues can be done in many ways. These factors include students who are potential humans, talents or intelligences possessed, and students who have multiple intelligences and diversity (Khafidah et al., 2020). The surprising finding of this study is that memorizing the Qur'ān had no direct effect on improving mathematical achievement but had to be mediated by self-regulated learning variables.

Total effect

The total effect of this research model is full mediation, meaning that exogenous variables are not able to significantly affect endogenous variables without going through mediator variables. This is in accordance with the role of mediation, according to Zhang and Ding (2022), fully mediated mediation will occur if the influence of the mediating variable on the endogenous variable is significant while the influence of the exogenous variable on the mediator is not significant.

The direct effect between the habit of memorizing the Qur'ān (KMA) and math learning achievement (MLA) of -0.035 with $p > 0.05$, shows that the results are not significant. However, with self-regulated learning (SRL) as moderator, it showed a significant effect of 0.417 with $p < 0.01$. This means that self-regulated learning is a good mediator for the habit of reading the Qur'ān in influencing mathematics learning achievement, where the influence of memorization habits of the Qur'ān on self-regulated learning is 0.215 with $p < 0.05$.

The direct influence between the big five personality dimensions and math achievement was insignificant with $p<0.05$, meaning that personality was not directly influenced by math achievement. Likewise, the habit of memorizing the Qur'ān also shows an insignificant correlation. This suggests that the big five personalities and Qur'ān reading habits are not good predictors of mathematical achievement. However, there is a significant correlation between 4 (four) dimensions of big five personalities namely openness to experience, agreeableness, neuroticism and conscientiousness with Self-Regulated Learning of -0.236, -0.208, -0.206 and 0.461 with $p < 0.05$ respectively.

The results of this research prove that self-regulated learning is a good mediator for the big five personalities and the habit of memorizing the Qur'ān. This means that the big five personalities and memorization habits of the Qur'ān affect self-regulated learning, then significantly affect the endogenous variable of mathematics learning achievement of the study subjects.

CONCLUSIONS

The results of this study show that the big five personality traits and the habit of memorizing the Quran affect mathematics learning achievement through self-regulated learning mediator variables, in accordance with empirical data in the field. Big Five Personalities-Conscientiousness, Extraversion, Agreeableness, Openness to Experience, and Neuroticism affect mathematics learning achievement both directly and through self-regulated learning mediator variables. The habit of memorizing the Quran has a considerable impact on mathematics learning achievement through self-regulated learning mediating variables. Due to the full mediating nature of this research model, exogenous variables cannot significantly influence endogenous variables without first passing through the mediator variables. The implication of this study confirms that the total effect is full mediation, this confirms that self-regulated learning has a direct effect on mathematics learning achievement and is a good mediator variable for the big five personalities and memorization habits of the Qur'ān. The perspective of self-regulated learning in student learning and achievement is not only special, but also has implications for how teachers should interact with students in regulating the teaching and learning process in schools. Therefore, there is an opportunity for the school to provide a kind of self-regulated learning training in order to improve metacognition, positive behavior skills in students from an early age. However, there are also limitations, which are expected to be corrected in future studies, such limitations as it should be noted that more subjects are needed to evaluate models using structural equation modeling and confirmatory factor analysis. In addition, the results of factor analysis showed that the measurement dimensions were modified due to the inclusion of several dimensions that were considered irrelevant for this particular investigation. Therefore, future research requires more contextual measuring tools in addition to careful attention to technical samples.

AUTHOR CONTRIBUTION STATEMENT

MK is a researcher responsible for collecting data, analyzing the research findings, and compiling the study outcomes. FS produced the article, specifically focusing on the introduction and discussion parts, and adjusted it to conform to the template journal. The first author submits the article. After the article was reviewed by the reviewer, the second author assisted in revisiting the adjustments made.

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