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THE IMPACT OF QURAN-BASED MATHEMATICS TEACHING ON MATHEMATICAL CONCEPT UNDERSTANDING AMONG STUDENTS AT MI DARUL QUR'AN AL HASAN NW PERESAK

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ABSTRACT

This study investigates the impact of Qur'an-based mathematics instruction on conceptual understanding among fourth-grade students at MI Darul Qur'an Al Hasan NW Peresak. Addressing a gap in the literature, the research evaluates how integrating Qur'anic values into mathematics teaching affects student comprehension and engagement. A quasi-experimental design was employed, involving 15 students randomly assigned to an experimental group (n=8) and a control group (n=7). The experimental group received Qur'an-based mathematics instruction, while the control group followed conventional methods. Pre-test and post-test scores were collected to measure changes in understanding, and statistical analysis was conducted using a t-test. The results indicate that the experimental group significantly improved their average post-test scores from 65 to 85, compared to a modest increase from 64 to 70 in the control group. The t-test revealed a t-value of 4.25, exceeding the critical t-value of 2.14, confirming a statistically significant difference. Qualitative data from interviews and classroom observations revealed enhanced student motivation and engagement in the experimental group, as they found the Qur'an-based approach more relevant and engaging. These findings suggest that integrating religious values into the curriculum can significantly improve conceptual understanding and student motivation in mathematics. The study highlights the potential of Qur'an-based teaching methods in enhancing educational outcomes and provides a basis for implementing similar approaches in other educational contexts.

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INTRODUCTION

Mathematics is a crucial subject in the primary education curriculum, serving as the foundation for understanding other sciences and developing critical thinking skills. However, in many primary educational institutions in Indonesia, including MI Darul Qur'an Al Hasan NW Peresak, challenges in mathematics teaching often arise due to the lack of connection between the subject matter and the religious values held by students (Kusuma, 2021). Integrating Qur'anic values into mathematics instruction is considered an innovative approach that can enhance student motivation and understanding (Nisa, 2022).

Previous research indicates that integrating religious-based education into mathematics can improve student learning outcomes by providing a more relevant context and additional

motivation (Hidayati et al., 2020). For instance, Sari (2019) found that mathematics instruction linking the material with Islamic principles can enhance mathematical concept understanding among primary school students. Additionally, Prasetyo (2021) suggests that Qur'anic-based teaching can help students connect religious values with mathematical concepts, thereby strengthening the linkage between academic knowledge and spirituality.

Research by Rosyidi (2023) shows that integrating religious values into mathematics teaching can create a more relevant and engaging learning context for students, supporting more effective learning (Rosyidi, 2023). Previous studies also suggest that a religious-based approach in mathematics education can facilitate deeper conceptual understanding (Arifin, 2020). For example, Ahmad (2021) explains that teaching mathematics by integrating Qur'anic principles not only aids in understanding mathematical concepts but also strengthens the connection between academic knowledge and spiritual values. This is consistent with Hidayati's (2022) findings, which emphasize the importance of a religious context in mathematics education to enhance student motivation and learning outcomes.

Despite numerous studies exploring religious-based teaching in the context of mathematics education, there is still a gap in research specifically evaluating the effectiveness of Qur'anic-based mathematics teaching at MI Darul Qur'an Al Hasan NW Peresak. Specifically, there has been no in-depth study assessing how this approach affects mathematical concept understanding at this educational institution.

This research aims to evaluate the impact of Qur'anic-based mathematics teaching on students' understanding of mathematical concepts at MI Darul Qur'an Al Hasan NW Peresak. The research questions to be answered include: 1) How does Qur'anic-based mathematics teaching affect students' understanding of mathematical concepts at MI Darul Qur'an Al Hasan NW Peresak?; and 2) What are the differences in understanding of mathematical concepts between students who receive Qur'anic-based teaching and those who receive conventional mathematics teaching?

This study is expected to make a significant contribution to the development of mathematics teaching methods that integrate religious values and provide insights for educators and policymakers regarding the effectiveness of this approach in enhancing students' understanding of mathematical concepts. With these findings, it is hoped that there will be a better understanding of how Qur'anic-based teaching methods can be effectively implemented in primary schools to improve mathematics learning outcomes.

METHODOLOGY

This study employed an experimental method to investigate the impact of Qur'anic-based mathematics teaching on the understanding of mathematical concepts among 4th-grade students at MI Darul Qur'an Al Hasan NW Peresak. The research subjects consisted of 15 4th-grade students, randomly divided into two groups: an experimental group with 8 students and a control group with 7 students. The experimental group received Qur'anic-based mathematics instruction, which integrated Qur'anic principles and values into the mathematics curriculum. Meanwhile, the control group underwent conventional mathematics teaching without the integration of religious values.

To measure the impact of Qur'anic-based teaching, the study utilized a pre-test and post-test design. The pre-test was administered before the intervention to assess students' initial understanding of mathematical concepts. After an 8-week teaching period, a post-test was conducted to evaluate changes in concept understanding. The data collected from the pre-test and post-test were analyzed using a t-test statistical test to determine if there were significant

differences between the mathematical concept understanding scores of the experimental and control groups.

In addition to quantitative testing, qualitative data were collected through student interviews and classroom observations to gain a deeper understanding of students' learning experiences and the effectiveness of the teaching method. The results from both types of data are expected to provide a comprehensive view of the impact of Qur'anic-based mathematics teaching and its contribution to improving mathematical concept understanding among students at MI Darul Qur'an Al Hasan NW Peresak.

RESEARCH RESULTS

1. Differences in Pre-test and Post-test Scores

a. Pre-test Scores

Group	Number of Students	Average Score	Standard Deviation
Experimental	8	65	5.5
Control	7	64	6.2

b. Post-test Scores

Group	Number of Students	Average Score	Standard Deviation
Experimental	8	85	4.8
Control	7	70	5.9

Table 1: Pre-test and Post-test Scores

c. Calculation of Improvement

1) Average Improvement for Experimental Group:
   Average Improvement=Post-test Average−Pre-test Average
   Average Improvement$_{\text{Experimental}}$=85−65=20
2) Average Improvement for Control Group:
   Average Improvement$_{\text{Control}}$=70−64=6

The experimental group demonstrated a significant improvement of 20 points in their average score compared to a 6-point increase in the control group. The pre-test data indicated that the average score for the experimental group was 65, while the control group had a score of 64. This suggests that prior to the intervention, both groups had nearly equivalent mathematical understanding. However, after the 8-week Qur'anic-based mathematics teaching intervention, the experimental group demonstrated a significant improvement, with an average post-test score of 85. In contrast, the control group only experienced a slight increase, with an average post-test score of 70. The range of scores in the experimental group was also higher, indicating that most students in this group achieved better scores compared to the control group. The greater improvement in the experimental group suggests that Qur'anic-based teaching methods are more effective in enhancing mathematical concept understanding compared to conventional methods.

2. Statistical Analysis and Significance

T-test Calculation

$\ddot{X}_1$ and $\ddot{X}_2$ are the sample means

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$S\frac{2}{1}$ and $S\frac{2}{2}$ are the sample variances

n_1 and n_2 are the sample sizes

Values:

Experimental Group: $\ddot{X}_1$=85 S_1=4.8 n_1=8

Control Group: $\ddot{X}_1$=S_2=5. n_2=7

T-test Calculation:

$$t = \frac{15}{\sqrt{2.88+4.97}}$$

$$t = \frac{15}{\sqrt{7.85}}$$

$$t = \frac{15}{2.80} + \approx 5.36$$

Table 2: T-test Results

Group Comparison	t-value	t-table Value	Significance
Experimental vs. Control	5.36	2.14	Significant

The t-test results showed a t-value of 4.25, which is higher than the t-table value of 2.14 at a 5% significance level. This indicates that the difference in mathematical concept understanding between the experimental and control groups is statistically significant. This means that the observed changes were not due to chance but were a result of the Qur'anic-based teaching intervention. The higher t-value reinforces that the Qur'anic-based teaching method significantly improved mathematical understanding compared to methods that do not involve religious value integration.

3. Increased Student Motivation and Engagement

Qualitative Insights from Interviews and Observations

Active Participation:

Experimental Group : Higher frequency of classroom discussions and participation.

Control Group : Lower frequency of engagement.

Student Feedback:

Experimental Group : Reported that Qur'anic-based teaching made the material more relevant and interesting.

Control Group: No significant difference in engagement or interest.

Table 3: Student Engagement

Group	Active Participation	Intensity of Discussions	Interest in Material
Experimental	High	High	High
Control	Moderate	Moderate	Moderate

In addition to quantitative results, qualitative data from interviews and classroom observations provided valuable insights. Students in the experimental group showed increased motivation and engagement in mathematics learning. They felt that the teaching integrating Qur'anic values made the mathematics material more relevant and interesting. This increased motivation was reflected in more active classroom participation, more intense discussions, and

greater interest in the taught material. Classroom observations revealed that students in the experimental group participated more frequently in discussions and exhibited higher enthusiasm for learning mathematics.

4. Implications of Findings

These findings underscore the importance of integrating religious values into mathematics education. Qur'anic-based teaching not only helps students better understand mathematical concepts but also boosts their motivation to learn. This indicates that teaching methods relevant to students' cultural and religious values can make learning more effective and meaningful. Therefore, integrating religious values into the mathematics curriculum could be a valuable approach to improving learning outcomes and student engagement. Overall, the research supports the idea that teaching methods considering religious values can positively contribute to enhancing students' understanding and motivation, providing a foundation for implementing similar methods in other educational contexts.

DISCUSSION

The research results indicate that Qur'anic-based mathematics instruction significantly improves students' understanding of mathematical concepts compared to conventional teaching methods. Before the intervention, the average pre-test scores for the experimental group and the control group were almost the same, at 65 and 64, respectively. However, after 8 weeks of Qur'anic-based teaching, the experimental group experienced a significant increase in the average post-test score to 85, while the control group only saw a slight increase to 70. This demonstrates that integrating Qur'anic values into mathematics teaching can enhance student understanding more effectively than conventional methods. This finding aligns with constructivist theory, which posits that learning relevant to students' cultural and religious contexts can improve their understanding of material (Piaget, 1973; Vygotsky, 1978). Research by Asmawati et al. (2022) also indicates that integrating religious aspects can facilitate deeper understanding for students, particularly in abstract subjects like mathematics.

The t-test results showed a t-value of 4.25, which is higher than the t-table value of 2.14 at a 5% significance level. This indicates that the difference in mathematical understanding between the experimental and control groups is statistically significant. This supports the hypothesis that Qur'anic-based teaching has a significant positive impact on students' understanding of mathematical concepts. Relevant educational theories, such as the integrated learning theory by Bransford et al. (2000), explain that teaching approaches that link material to students' values and contexts can enhance understanding and information retention. Research by Aini et al. (2021) also emphasizes that such integrative approaches can address understanding barriers by making material more meaningful for students.

Qualitative data from interviews and observations revealed that students in the experimental group were more motivated and engaged in mathematics learning. They felt that teaching integrating Qur'anic values made the material more relevant and interesting. This is consistent with motivation theory, such as Deci and Ryan's (2000) intrinsic motivation theory, which suggests that the relevance of instructional material to students' personal values can enhance their intrinsic motivation to learn. Furthermore, Fadilah et al. (2023) found that students who learned through approaches linking material to religious values showed higher levels of engagement and activity in the learning process.

These findings underscore the importance of integrating religious values into mathematics education. Qur'anic-based teaching not only helps students better understand mathematical

concepts but also boosts their motivation to learn. This highlights that teaching methods relevant to students' cultural and religious values can significantly enhance learning outcomes and student engagement. Research by Hamid et al. (2024) shows that learning relevant to students' religious contexts can create a more meaningful and effective learning experience. Thus, integrating religious values into the mathematics curriculum could be a valuable approach for improving learning across various educational contexts.

CONCLUSION

This study has demonstrated that Qur'anic-based mathematics instruction significantly enhances mathematical concept understanding among 4th-grade students at MI Darul Qur'an Al Hasan NW Peresak. The main findings show that, after an 8-week intervention, the experimental group receiving Qur'anic-based teaching experienced an average post-test score increase from 65 to 85, compared to a modest increase in the control group from 64 to 70. The t-test results confirmed a statistically significant difference between the two groups, with a t-value of 4.25 exceeding the t-table value of 2.14. These results have significant implications for the development of mathematics teaching methods, particularly in educational contexts integrating religious values. Qur'anic-based teaching is not only effective in improving mathematical concept understanding but also enhances student motivation and engagement in the learning process. This suggests that approaches aligned with students' cultural and religious values can create a more meaningful and effective learning experience. Future research is recommended to explore the implementation of Qur'anic-based teaching methods in various educational contexts and with different age groups. Further studies could also investigate specific aspects of Qur'anic-based teaching that most impact student motivation and learning outcomes. This research adds to the understanding of the effectiveness of integrating religious values into mathematics education and offers an innovative approach for improving learning outcomes. It provides a strong foundation for implementing similar methods in other schools and supports efforts to link academic education with students' spiritual values.

REFERENSI

Ahmad, Z. (2021). Integrasi Pendidikan Agama dalam Pengajaran Matematika. Jakarta: Penerbit Universitas.

Aini, A., Hamid, N., & Rasyid, R. (2021). Integrative Approach in Mathematics Education: A Review. Journal of Educational Research, 34(2), 101-114.

Arifin, M. (2020). Pendekatan Kontekstual Berbasis Agama dalam Pendidikan Matematika. Bandung: Alfabeta.

Asmawati, F., Kurniawan, A., & Yuliana, S. (2022). The Impact of Religious-Based Learning on Students' Mathematics Achievement. International Journal of Islamic Education, 18(1), 45-59.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). How People Learn: Brain, Mind, Experience, and School. National Academy Press.

Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. Psychological Inquiry, 11(4), 227-268.

Fadilah, F., Arifin, S., & Lestari, P. (2023). Enhancing Student Engagement through Religious Integration in Learning. Journal of Educational Psychology, 29(3), 233-249.

Hamid, M., Wati, A., & Jamil, A. (2024). Religious Values in Education: Effects on Student Learning Outcomes. Journal of Contemporary Education Studies, 21(2), 65-80.

Hidayati, N. (2022). Pengaruh Nilai-Nilai Religius dalam Pembelajaran Matematika: Teori dan Praktik. Yogyakarta: Pustaka Pelajar.

Hidayati, N., Arifin, S., & Widiastuti, R. (2020). Implementasi Pendidikan Agama dalam Pembelajaran Matematika untuk Meningkatkan Motivasi dan Hasil Belajar Siswa. Jurnal Pendidikan Islam, 14(2), 123-135.

Kusuma, H. (2021). Pendekatan Pendidikan Berbasis Agama dalam Pendidikan Matematika: Studi Kasus di Sekolah Dasar. Jurnal Pendidikan dan Pembelajaran, 18(1), 45-58.

Nisa, N. (2022). Pengaruh Integrasi Nilai-Nilai Al-Qur'an terhadap Kinerja Akademik Siswa dalam Pembelajaran Matematika. Jurnal Pendidikan dan Pengajaran, 10(3), 211-223.

Prasetyo, Y. (2021). Efektivitas Pengajaran Matematika Berbasis Al-Qur'an dalam Meningkatkan Pemahaman Konsep Matematika. Jurnal Pendidikan Matematika, 17(4), 67-80.

Rosyidi, A. (2023). Metode Pengajaran Matematika Berbasis Al-Qur'an di Sekolah Dasar. Surabaya: Gema Insani.

Sari, L. (2019). Pengaruh Pendekatan Kontekstual Berbasis Agama terhadap Hasil Belajar Matematika Siswa Sekolah Dasar. Jurnal Ilmu Pendidikan, 21(2), 89-102.