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Effectiveness of Use of Islamic Integrated Mathematics E-Modules To Improve Mathematical Problem Solving Capability

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Abstract: The unavailability of teaching materials that can support mathematical problem-solving abilities and are integrated with Islamic teaching values makes it difficult for SMP IT educators to hone students' mathematical problem-solving abilities and difficulties in instilling Islamic values in students. One solution that educators can use in learning is to use e-modules. E-module is a teaching material that has the characteristics of independent learning principles. This research aims to see the effectiveness of using mathematics e-modules that are integrated with Islamic values in facilitating students' mathematical problem-solving abilities. This type of research is pre-experimental research and the research design is one group pre-test-post test design. The sampling method is purposive sampling, where one class is taken directly from the population as a research sample. The subjects of this research were 24 students in class VIII.1 at SMP IT Qurrata A'yun Batusangkar. The effectiveness of the mathematics e-module can be seen from the comparison of the results of the pre-test and post-test of students' mathematical problem-solving abilities. The final results of the student's mathematical problem-solving ability test obtained were 57% of the total maximum score, while the results of the student's initial mathematical problem-solving ability test were only 22% of the maximum score. Because 57%>22%, these results indicate that the use of Islamic integrated mathematics e-modules is effective in facilitating students' mathematical problem-solving abilities.

Keywords: effectiveness; e-module; integrated; mathematics

Introduction

According to the Trends in Mathematics and Science Study (TIMSS) in the field of mathematics which measures students' understanding, representation, reasoning, and mathematical problem-solving in 2003, Indonesia was ranked 34th out of 46 countries, ranked 36th out of 49 countries in 2007 and ranked 38th out of 42 countries in 2011, and most recently in 2015, placing Indonesia in 44th place out of 49 countries with 379 points. It can be seen that Indonesia's ranking has consistently decreased. Meanwhile, the results of the Program for International Student Assessment (PISA) assessment in 2018 are even more concerning, because Indonesia is ranked 74th out of 80 participating countries with an average of 379 while the international average is 489 (Sujadi et al., 2023). These findings are supported by the results of the initial test of students' mathematical problem-solving abilities at Qurrata A'yun Batusangkar IT Middle School, which only obtained a score percentage of 22% of the total maximum score. This shows that the reality regarding our students' mathematical problem-solving abilities is not as expected.

One of the causes of this is the lack of interesting teaching materials for students so that they are enthusiastic about learning mathematics and can hone their skills (Mangwende & Maharaj, 2019). Furthermore, seeing how vulnerable the current generation's social interactions are which make them far from the teachings of the Islamic religion, Islamic-based schools such as SMP IT Qurrata A'yun need to have teaching materials that are integrated with the values of Islamic teachings so that the instillation of Islamic values can be carried out directly. applied during the mathematics learning process. So, it is necessary to use teaching materials that

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are integrated with Islamic teaching values and can hone students' mathematical problem-solving abilities.

The solution that researchers offer is to use an Islamic integrated mathematics e-module that covers all these aspects. A preliminary study conducted by (Anggraini et al., 2023), stated that the module was very effective in improving students' mathematics learning outcomes, where initially students' completeness was 37.50% after using the module, students' completeness increased to 73.33%. On the other hand, indirectly the inclusion of Islamic values in mathematics learning can influence and improve student learning outcomes. As explained by (Permana, 2023); (Gradini et al., 2021), mathematics learning that integrates Islamic values can increase student activity in learning mathematics and effectively improve student learning outcomes. This has been shown by (Mahmudah & Muqowim, 2022) in his research, where students' ability to solve mathematical problems can be improved by integrating Islamic values into mathematics modules.

Method

The research was carried out in a pre-experimental type and the research design was a group pre-test-post test design. The sampling method is purposive sampling, where a sample can be taken directly in the class based on the population that can be used as a sample, and the class is used as an experimental class. The subjects of the research were all students in class VIII.1 of SMP IT Qurrata A'yun, which had 24 members. Tools that can be used to support its implementation are tests in solving a problem mathematically. The way to see the effectiveness of the Islamic integrated mathematics e-module used is by analyzing students' answer sheets which are based on test result scoring guidelines in solving problems mathematically at the post-test stage, then compared with the test results obtained at the initial stage. The use of Islamic integrated mathematics e-modules can be said to be effective if students' post-test results get a score of more than 22% of the total maximum score.

Result and Discussion

Results

Effectiveness comes from the basic word effective. In the general Indonesian dictionary, effective means; having an effect, influence, consequence, providing satisfactory results, and making the best use of time and methods. In research in the field of learning, indicators to state that the mathematics e-module used is said to be effective can be seen from the following components (Rochmad, 2012): student learning outcomes; student activities; and students' mathematical abilities, for example, the students' ability to solve a problem mathematically. These components can differ from one study to another depending on the definition (emphasis of the term) of what is called effective in the study. In this research, the component used to see the effectiveness of the mathematics e-module used is the student's ability to solve a problem mathematically.

The characteristics of the mathematics e-module that has been used, focus on the integrated Islamic part, namely on instilling Islamic teaching values through material and questions in the e-module, starting from the use of Islamic names and terms, Islamic images or characters and propositions. Al-Qur'an or Hadith equipped with murottal audio. Such as the command to avoid wasteful actions, be filial, and do good to parents, Allah Ta'ala's prohibition on usury, the virtue of giving alms to help those who are less fortunate, a way to eliminate satanic interference from the house by reciting Surah Al-Baqarah, the command to cover the private parts, advice to always think critically about the extraordinary creation of Allah Ta'ala and the command to always be honest.

Table 1. Comparison of Pre-test and Post-test Analysis Results

Indicator	Pre-test (%)	Post-test (%)
Understand the problem	61	22
Create a resolution plan	74	19
Implement the resolution plan	62	18
Draw a conclusion	50	31
Total	57	22

The results of the effectiveness of using mathematics e-modules are seen based on students' understanding of solving a problem mathematically. Indicators of mathematical problem-solving ability consist of understanding the problem, making a solution plan, implementing the solution plan, and drawing conclusions (Hamzah, 2014). Student ability tests are carried out before and after learning with the Islamic integrated mathematics module is completed. A comparison of the analysis of students' pre-test and post-test scores is depicted in table 1.

Discussion

The results of the comparison of analysis of answer sheets regarding the assessment in solving a problem mathematically at the pre-test and post-test stages show that the percentage score obtained at the post-test stage

has exceeded the percentage score at the pre-test stage. So, it can be said that the use of Islamic integrated mathematics e-modules is effective in improving students' abilities in mathematical problems (Yasin et al., 2020); (Sari & Ariswan, 2021). The ability of mathematics e-modules with Islamic nuances to increase students' ability to solve problems mathematically is due to several things, including that in mathematics e-modules, each step is arranged systematically which aims to require students to independently build the knowledge they need to know. the correct way (Mawardi et al., 2019). Learning with interactive learning materials such as e-modules is better than using conventional learning strategies, and can improve students' mathematical abilities as well as making the learning process more interesting and making learning more effective (Dini et al., 2023); (Hillmayr et al., 2020).

Apart from that, students' ability to solve problems mathematically is honed due to the use of Islamic values in each material in the mathematics e-module (Akbar et al., 2022); (Muslimin et al., 2020). Integrating Islamic values in mathematics learning increases students' interest in learning (Nihayati et al., 2022); (Azzuhro & Salminawati, 2023). The background of SMP IT, which is an integrated Islamic-based school, instills Islamic values close to students, increases students' confidence in learning, and makes students interested and has high curiosity, especially since this is something new for participants. educate. A person will be motivated to learn because of curiosity that arises from feelings of curiosity. When the reading process can satisfy the curiosity instinct, what happens is a feeling of pleasure and a strong desire to repeat it so that interest begins to form. When a student has a high level of curiosity and interest in learning, it will automatically hone the student's ability to understand a problem and solve the problems that have been found (Darling-Hammond et al., 2020); (Javaid et al., 2023). Based on the explanation above, it can be said that these things are what causes learning using mathematics e-modules which are integrated with Islamic values to be able to improve students' ability to solve problems mathematically (Rakhmawati, 2023).

Mathematics is wrong an important science to learn not only by mathematicians will but also by someone who involved in other fields such as medicine, engineering, economics, IT and others. Not all part of mathematics is required by someone who is engaged in each each field. Therefore, mathematical knowledge is necessary adapted to field needs which is pursued. Modules can guide students to learn independently (Rach & Ufer, 2020). Additionally, components-components contained in the module allows students to measure each other's abilities and can study the appropriate modules individual learning speed. With a mathematics module this technique is expected to be able to increase motivation and interest in learning mathematics become one of the basics of science (Moreno-Guerrero et al., 2020); (Hadiyanti et al., 2021); (Yeh et al., 2019). Apart from that, modules can also be used meet student needs regarding understanding the concept mathematics. Several causal factors effectiveness of using the module (Jatain et al., 2023);(Maya-Jariego et al., 2022); (Rajabalee & Santally, 2021) . The first is that the module has been validated by material experts, media experts, language experts and practical and stated lecturers quite valid and practical and can be done used in learning so as to increase results Study.

This is in line with the results research by (Coman et al., 2020). Second, the module is structured with accompanied by contextual examples in easier language understood by students motivated to learn as student responses through questionnaires. Matter this is in accordance with the research results from (Penuel et al., 2022); (Chin & Osborne, 2008), which states the phenomenon problems in everyday life day makes students more interested following the lessons as well as (Dempsey et al., 2023), stated that with the motivation module increased significantly. Third, the module is compiled based on classroom learning consists of eye learning achievements lectures and indicators, apperception, material, application of material, understanding of concepts, summary, practice questions, answer key, as well as self-reflection for students can learn and measure each other's abilities. Matter this is in accordance (Cuevas, 2015), who stated that the use of the module will be in accordance with level of ability and needs as well each student's steps.

Conclusion

From the results of the research that has been explained, it can be concluded that the use of Islamic integrated mathematics e-modules in learning is effective in improving students' mathematical problem-solving abilities. This result was obtained from a comparison of the results of the pre-test and post-test analysis which showed a figure of 22% versus 57%.

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Author Contributions

Conceptualization; H. K., D. P., Y., I. M. A.; methodology.; H. K..; validation; D. P..; formal analysis; Y.; investigation.; I. M.

A.; resources; H. K; data curation: D. P.; writing—original draft preparation. Y.; writing—review and editing: I. M. A.; visualization: H. K. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest
The authors declare no conflict of interest.

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