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Alquran Values-Integrated Physics Modul: The Effect on Students' Problem Solving Skill and Spiritual Attitude in Physics

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ABSTRACT
Along with the development of technology, education today must create a quality young generation (students). This quality is not only intellectual, but in terms of the spiritual attitude and skills produced, one of the most needed is problem solving skill. This study aims to determine the effect of implementation physics module integrated with Quran values on problem solving abilities and spiritual attitudes of students in physics learning. The used method in this study is experiment with Non Equivalent Control Group Design. The sample consisted of 2 class X MIA selected through a purposive sampling technique. The results showed that there was a significant influence of the use of physics module integrated with Quran on the problem solving ability and spiritual attitudes of students in physics learning. The integrated physics module with Qur'an values is able to train problem solving skills that are needed by students in the process of thinking solutions to a problem in real life in physics concept and also able to grow spiritual attitudes as an effort to fulfill the first core competence, namely spiritual competence.

INTRODUCTION

As technology develops, it is compulsory for the current education to create qualified young generation (students). this is not only an intellectual quality but also in terms of the spiritual attitude and skills produced. Spiritual attitude is an attitude that emphasizes students to become human beings who believe and fear Allah SWT. It is expected that students might become virtuous and be ethical people [1].

The statement above is in line with the objectives of national education in which aimed at producing the young generations (students) who believe, have faith, have a noble character, knowledgeable, capable, creative, and are able to face the times as the result of the implementation of the education. It is contained in Law Number 20 of 2003 Article 3 concerning the National Education System: "The purpose of national education is to develop the potential of students to become people of faith and fear

of God Almighty, have good morality, be healthy, have the knowledge, be capable, be creative, independent, and become democratic citizens and responsible " [2].

A scientific approach is an approach that requires students to find and reveal the facts data with their own through an activity. This is in accordance with research conducted by Fauziah [3] stated that a scientific approach is an approach that emphasizes the process of searching and finding itself. Furthermore, it is strengthened in the journal [4] stated that the scientific approach is learning that emphasizes more students to search for and find their own facts through observing, asking, trying, collecting, and communicating. The curriculum deployed is the revised 2013 curriculum or it is other terms of the National Curriculum. The revised 2013 curriculum is a curriculum that emphasizes learning through the scientific approach. This scientific approach has been integrated with learning physics.

Physics learning is one of learning related to everyday phenomena [5]. In the competence of graduate, students must be able to integrate the concepts that have been learned and be able to relate them to everyday phenomena [6]. It is expected that students will be able to solve every problem that arises [7]. In learning, teaching materials are also needed as a means of learning for students. The teaching material must be in accordance with the achievement of competence. Furthermore, in physics learning the improvement of students' problem-solving abilities might be realized if the whole educational components work together. The components of education are including the teachers, students, curriculum, learning media, materials, methods, evaluation tools, and learning resources [8].

Learning resource is one of the most important components in improving students' problem-solving abilities. One of the learning source is teaching materials [9]. Teaching materials might help teachers during the learning process to display competencies that should be mastered by students. The teaching materials used by teachers are generally textbooks in the form of e-books and printed books, or modules that are made independently.

Physics modules developed by the teacher independently are generally still focused on achieving cognitive and psychomotor aspect. This is evidenced by teacher interviews which prove that spiritual attitudes are not specifically taught in physics, even written on learning resources are not. Another problem is obtained from the results of a preliminary study in an MA (Islamic senior high school) conducted using interview techniques, observation, and test problems, show that the problem-solving abilities of students need to be improved. Based on the results of interviews with physics teachers stated that most students still consider physics is difficult to understand and identical to the formulas that must be memorized. When the teacher gave them a problem, most of them still could not solve the problem given completely. In addition, teaching materials that are commonly used are in the form of books. As for the module, the teacher has not provided it yet. So far the teacher has never made a physics module that integrates the values of the Quran yet. Moreover, the physics module is integrated with the values of the Quran in which it connects physics with the verses of the Quran. Likewise with the schools that have never provided teaching materials in the form of modules.

Based on the results of interviews with students stated that learning physics is difficult and complicated as well as many formulas that must be memorized. Students have difficulty when working on calculation problems that use physics formulas. So students need additional explanations of physics material presented in teaching materials. Teaching materials commonly used in the form of textbooks provided by schools. Learners only use textbooks in the learning process. Occasionally students use modules in practical activities. However, the modules used have not integrated with the values of the Quran yet. So far the students have never used teaching materials in the form of physics modules integrated with the Quran values. This is in line with Sri's statement, teaching materials in the form of integrated physics modules compiled by the teacher are very rare, the use of teaching materials containing Qur'anic values is still relatively low [10].

The results of observations of learning and learning activities in 10th grade science 1 and 2 in Al-Istiqomah where located in Cimahi, West Java showed that teachers only use conventional methods namely lectures and questions and answers. After the lecture, the teacher explained the sample questions that come from the student handbook. The teacher gave some question exercises to students that are displayed through the projector. Not all students could solve the problems given by the teacher. Students tended not to want to complete their own tasks but discuss with other friends. In addition, students were only fixated on the sourcebook provided by the school. While most of the students have gadgets that might be useful if used as learning resources such as using the internet and downloading learning materials. Based on the explanation from the results of the teacher and student interviews, it might be seen that the students' problem-solving abilities still need to be improved and efforts to hone their problem-solving abilities are still lacking.

Besides using interviews and observations, the test was also carried out with regard to the ability to solve problems that aim at determining the certainty of the problems that occurred. The results of the test run on the materials of work and energy are shows each indicator of problem solving skills, namely description of useful concepts, physics approach, specific physics application, mathematical procedure, logical development and description of useful concept having an average score range of 29.9 included in the low category

The results of trial problems related to problem-solving abilities which show that students' problem-solving abilities need to be improved. Therefore, there needs to be an improvement in learning so that students might improve their problem-solving skills in physics, especially on the concepts of work and energy.

After analyzing the various problems above. A learning device is needed in the form of a physics module that allows students to hone problem-solving skills. Several researchers have developed teaching materials that contain spiritual attitudes, this adds to the belief for researchers that teaching materials with spiritual attitudes are effectively used in the learning process [11] [12]. Strengthened by research conducted by Arini [13], where Arini developed a problem solving module to improve the problem-solving abilities and scientific attitudes of students, Arini's research results showed that there was a significant increase in the problem-solving abilities and scientific attitudes of the participants. students seen from the gain value of 0.47 are included in the medium category, making researchers want to make an innovation by developing modules containing integrated physics concepts, the values in the verses of the Qur'an refer to core competence 1, where students are expected to form and grow a sense of gratitude God Almighty is good at practicing and living up to the teachings he adheres to. The teaching materials developed by Hidayati [11] only focus on spiritual attitudes. Meanwhile, the module developed by Arini [13] only focuses on problem solving skills. Both showed very effective results in learning so that researchers tried to combine both problem-solving abilities and spiritual attitudes into one physics module by integrating them with the values of the Qur'an. Therefore, the purpose of this study is the effect of using an integrated physics module with the values of the Qur'an on problem solving abilities and spiritual attitudes of students in learning physics.

METHOD

Quasi-Experimental Design was deployed as the research method, and the Non-Equivalent Control Group Design was deployed as the research design. This study deployed two classes, namely the experimental class, and the control class. Both of these classes were given a pretest at the beginning of learning and a posttest at the end of learning. Pretest was given to both classes before getting treatment, after that only the experimental class was given treatment in the form of learning by using an integrated module of Qur'an values on the concept of work and energy. While the control class without using the integrated Physics module values the Qur'an. Both classes will be given a posttest at the end. The design of this study could be presented in the table below [14]:

Table 1. Research design

Group	Pretest	Treatment	Posttest
Experimentation Class	O_1	X_1	O_2
Control Class	O_3	-	O_4

The type of data used in this study is qualitative data and quantitative data. Qualitative data obtained from observations of the implementation of learning using physics modules integrated with Quran values. Quantitative data were obtained from the pretest and posttest scores to find out the improvement of students' problem-solving abilities and spiritual attitudes.

The population of this research is the whole class X in MA Al-Istiqomah. Sample selection is conducted by using the Purposive Sampling technique, which is the selection of the sample is conducted by taking a subject based on certain considerations and objectives. One consideration is the lack of facilities and infrastructure as well as heterogeneous classes. The sample used in this study was class X MIA 1 as an experimental class and X MIA 2 as a control class. The school was used as a research site because the school did not provide the physics module integrated with Quran values. In addition, teachers have never provided or made their own physics modules integrated with Quran values.

The research data obtained through instruments in the form of written tests and attitude scales. For more details, here are an explanations of the instruments used in the study:

Research Instrument
The first instrument deployed in this study was a written test. The written test is a test that is carried out to find out the difference in the improvement of problem-solving ability with five indicators adapted from the problem-solving ability [15]. This test is in the form of a pretest and posttest which is arranged based on aspects of problem-solving ability. The second instrument is an attitude scale test that is compiled based on indicators of achievement of spiritual attitude competencies using a self-assessment format.

Analysis of research instruments

a. Problem Solving Ability Test
Written test analysis in the form of essays on problem-solving skills includes qualitative and quantitative analysis. One thing to consider in qualitative analysis is one of the principles of item analysis. The principle is the principle of writing questions by paying attention to aspects of each question whether it is in terms of material, language and answer keys, and so on. While the quantitative analysis is conducted by testing the feasibility of the instrument, namely: 1) Validity Test 2) Reliability Test 3) Level of Difficulty Item Test 4) Test Discrimination Index. The problem-solving ability essay questions used have been previously tested on 7th semester students. The test results show a validity value of 0.64 which is included in the high category and the reliability value of essay questions shows a value of 0.79 which is included in the high category. The test results show that the essay problem-solving ability instrument is valid and reliable to use.

b. Spiritual Attitude Test
Spiritual attitude tests were analyzed qualitatively by a team of experts. Things that need to be considered in the qualitative analysis of spiritual attitude tests are the suitability of the rubric of spiritual scale assessment with indicators of achievement of spiritual attitude competencies that have been prepared. Last, the expert team analyzed the scoring guidelines used.

Research Data Analysis Techniques
Written test analysis in the form of essay questions is deployed to find out the differences in problem-solving abilities and spiritual attitudes. Data from the results of the pretest and posttest were analyzed by the steps: first scoring and then normalization of gain.

The researcher obtained a normalized gain score by using a formula developed by Hake [16] as the equation below:

$$NG = \frac{Posttest\ score - pretest\ score}{Maximum\ score - pretest\ score}$$

The N-gain value obtained is then interpreted according to the categories listed in Table 2

Table 2. Interpretation of Normalized Gain Average

Normalized average Gain Score	Category
g < 0,3	Low
0,3 ≤ g > 0,7	Medium
g ≥ 0,7	High

The last is statistic test. This statistical test is carried out to test normality, homogeneity, and to test the hypothesis using the t-test.

RESULTS AND DISCUSSIONS

The results of the study are presented as a whole the results of the acquisition of a problem-solving ability score and score of the attitude scale of students on materials of work and energy before and after the use of physics modules integrated with Quran values accompanied by N-Gain and hypothesis testing.

Research Result

a. Result of Problem-Solving Ability

1) The overall result of problem-solving ability

The distribution of students' problem-solving ability scores can be shown by comparing the average scores of pretest, posttest, and N-Gain of students on materials of work and energy.

Table 3. Pretest, Posttest and N-Gain Score for Problem-Solving Ability

	Score		N-Gain	Interpretation
	Pretest	Posttest		
Total	505	1686	0,40	Medium
Average	21,04	70,25		

Based on table 4 above, it is revealed that the improvement of problem-solving skills through physics modules integrated with Quran values on materials of work and energy are included in the medium category with an average N-Gain of 0.40, an average pretest 21.04 and a value of posttest average of 70.25. Therefore, there is an influence at the same time there is an enhancement in students' problem-solving abilities after the use of the physics modules integrated with Quran values on materials of work and energy

2) Results of each indicator test on problem-solving ability

The average score of the pretest, posttest, and N-Gain for each indicator of students' problem-solving ability is presented in Table 4.

Table 4. Pretest, Posttest and N-Gain scores for each indicator of problem-solving ability

No	Problem-Solving Ability Indicator	Score		N-Gain	Interpretation
		Pretest	Posttest		
1	Useful description	35,00	90,42	0,48	Medium
2	Physics approach	18,19	80,42	0,47	Medium
3	Specific application of physics	15,14	50,83	0,26	Low
4	Use of mathematics	17,22	63,19	0,35	Medium
5	Logical progression	19,44	65,97	0,36	Medium
Average		**20,99**	**70,17**	**0,40**	**Medium**

Based on table 4 above it is revealed that the indicator with the highest N-Gain acquisition is the useful indicator. While the indicator with the lowest N-Gain acquisition is the indicator of the specific application of physics or the specific application of physics. So, the average N-Gain per-indicator in the categorized experimental class.

b. Result of Spiritual Attitude

1) The overall result of spiritual attitude

The distribution of spiritual scores of students can be shown by comparing the average scores of pretest, posttest, and N-Gain of students.

Table 5. Pretest, Posttest and N-Gain scores for each indicator of spiritual attitude

	Score		N-Gain	Interpretation
	Pretest	Posttest		
Total	596	3054	0,88	High
Average	18	90		

Based on table 5 above, it is revealed that the enhancement in students' spiritual attitudes through the physics modules integrated with Quran values on materials of work and energy is included in the high category with an average N-Gain of 0.88, an average pretest score of 18 and an average score posttest 90. Therefore, there is an influence at the same time there is an enhancement in the spiritual attitude of students after the use of physics modules integrated with Quran values on materials of work and energy

2) Results of each indicator test on spiritual attitude

The average score of the pretest, posttest, and N-Gain for each indicator of students' spiritual attitudes is presented in Table 6.

Table 6. Pretest, Posttest and N-Gain scores for each indicator of spiritual attitude

No	Spiritual Attitude Indicator	Score		N-Gain	Interpretation
		Pretest	Posttest		
1	SA1	18	90	0,88	High
2	SA2	22	90	0,88	High
3	SA3	22	99	0,98	High
4	SA4	9	79	0,77	High
5	SA5	4	82	0,82	High
6	SA6	28	98	0,97	High
Average		17.17	89.67	0.88	High

Based on table 6 above, it is revealed that the indicator with the highest N-Gain acquisition is the SS3 indicator. While the indicator with the lowest N-Gain acquisition is the SS4 indicator. So, the average N-Gain of each indicator in the high category experimental class.

c. Hypothesis Testing

1) Hypothesis testing on problem-solving ability

This hypothesis test is intended to test the research hypothesis, which will later be accepted or rejected. The results of the normality test state that the pretest and posttest research data are normally distributed but the data is homogeneous and the sample is 34 people, then the hypothesis testing is done using the T-test.

According to the calculations, the recapitulation of the results of the hypothesis testing of the experimental class pretest data and the posttest data of the experimental class could be seen in Table 7.

Table 7. Recapitulation of the results of the hypothesis test

Aspect	Score
Total students *(N)*	34
t_{count}	60,03
$t_{table(\alpha=0.01)}$	2,738
Result	$t_{count} > t_{table}$
Interpretation	H_0 rejected and H_a accepted
Criteria	There is a significant enhancement

Based on the results of the hypothesis test (t-test) in table 9 above, the t_{count} = 60.03. At the significance level of 0.01, the value of t_{table} = 2.738. From these data, it shows that the value of t_{count} is greater than the value of t_{table} ($t_{count} > t_{table}$). This analysis might show that there is a significant influence on the enhancement of students‘ spiritual attitudes after applying physics learning using physics modules integrated with the Quran values.

Discussion

This section discusses the enhancement of problem-solving abilities on materials of work and energy based on the results of the analysis in the previous section.

a. Enhancement of Problem Solving Ability

The research that has been conducted showed that the use of integrated physics modules in the Quran values might improve students' problem-solving abilities. Based on the results of the pretest analysis of problem-solving abilities, students' initial ability might be considered as deficient. After that, learning was conducted with an integrated physics module of the Quran values and then given a posttest to measure the enhancement on students' problem-solving abilities. After carrying out the teaching-learning process, the results of the pretest and posttest analysis of the N-Gain was conducted. Based on the results of the data analysis, the N-Gain category showed that the problem-solving ability is better after learning by using the integrated physics module of the Quran values with an N-Gain score of 0.40 included in the medium category.

The results of the study were obtained from the three sub-materials taught, the sub-material with the highest N-Gain was in the energy conservation sub-material. While the sub-material with the lowest N-Gain is on the sub-materials on materials of work and energy. The energy conservation law sub-materials becomes the highest N-Gain since when it comes to the pretest on the energy conservation law sub-item, none of the students answered it. The students assumed that the problem was very difficult and feel exhausted to fill it in and the remaining time is not enough. Therefore, the average in the matter of the pretest sub-material law of conservation of energy is zero. However, after students had learned to use the physics module integrated with Quran values in which there are fairly complete physical concepts, examples of problem-solving abilities, instructions for practicum activities, and Qur'anic verses related to physics concepts and there are exercises a matter of problem-solving ability. It might train the students in working on problem-solving skills. Consequently, when the posttest question is given, the students were able do it well. The result is an enhancement in the sub-material energy conservation law has a higher N-Gain than other sub-concept. This statement is supported by research conducted by Merino which states

that the knowledge of students after being given teaching materials will be better than before getting teaching materials [17].

The sub-materials of work and energy were the lowest N-Gain. Because when it comes to pretest questions the most of the students answered with fairly complete answers. So there was a pretest value, although the score is not too satisfying and the sub-material is also not too difficult. When students learn with physics modules integrated with the Quran values. The teaching-learning process had not gone well. After that, a posttest was given and there was an enhancement, although it was still low. This happens because the concept of effort and energy is a basic concept of science, where the concept of energy is the only concept that is considered a core idea in learning biology, chemistry and physics, as well as concepts that cross these disciplines [18].

The results of the study and findings obtained by researchers revealed that from the five indicators of problem-solving ability that is the indicator of problem solving ability with the highest score acquisition is a useful indicator. Whereas the indicator of problem-solving ability with the lowest score is the specific application indicator of physics or the specific application of physics.

Mr. Solih and his family were on vacation out of town using a private vehicle, a car. Suddenly the tire was leaked. Mr. Solih tried to push the car to the side of the road. However, the car did not move at all. Then his wife and children helped him to push the car. Finally, the car moved to the side of the road.
These events have been explained in Q.S. Al-Ankabut: 69
٦٩) الْمُحْسِنِينَ لَمَعَ اللَّهَ وَإِنَّ سُبُلَنَا لَنَهْدِيَنَّهُمْ فِينَا جَاهَدُوا وَالَّذِينَ
"And those who try to (seek pleasure) We, We will really show them our ways. And surely Allah is trully with those who do the goodness."

a. Describe the problem in the description above and include important information that might be taken?
b. Explain the general physics concepts related to the above problem?
c. What is the relationship between force and displacement?
d. What if the displacement is enlarged and reduced?
e. According to your opinion, how many people should Mr. Solih add to make his car move? Explain the reason!

Students' Answers

a. The problem is that when Mr. Solih and his family are on vacation, suddenly in the middle of a trip his car tire leaks. The information was that Pak Solih tried to push the car but did not move at all and finally the mother and her child helped Pak Solih in pushing the car. (Useful Concept Description Indicator)
b. Work is described as the force exerted on an object so that it moves over a certain distance. (Physics Approach Indicator)
c. The relationship if there is no automatic force will not cause movement so it will not experience displacement. (Specific Application of Physics Indicators)
d. If the displacement is large, the force required is also large and if the displacement is small, the force required will also be small. (Mathematical Procedure Indicator)
e. Add a few more people so that the car is easy to push and will be able to be moved to the side of the road. (Logical Progress Indicator)

The description indicator is useful as an indicator of problem-solving ability with the highest score acquisition since through these indicators students are accustomed to describing problems or identifying problems in working on the problems. This is in line with research conducted by Tumanggor et al [19, students can already choose information that can be useful for problem solving. It is strengthened by research by Docktor et al [20] which states that students who have broad knowledge and concepts will be useful in determining the solutions that will be used to solve problems.

The specific application indicator of physics or the specific application of physics is an indicator of the ability to solve problems with the lowest score due to the indicators that students have not been able to apply the concepts and principles of physics from the concepts chosen previously. Whereas the specific application of physics might include a statement of definition, the relationship between the amount specified by the initial conditions, and the assumptions or constraints in the problem. Dwi [21] suggested that indeed the biggest difficulty was to apply the principles of physics correctly and relevantly.

b. Enhancement of Spiritual Attitude

The collection of spiritual attitude data in this study using attitude self-assessment sheets in the form of a Likert scale with the results obtained based on N-Gain calculations stated that the spiritual attitude of students increased in either category. On average from all meetings, the SS3 indicator is always higher than the other indicators. At the three meetings, the SS3 indicator has an average of 97. While the lowest average is on the SS4 indicator with an average of 77. This average difference indicates that these categories of 3 spiritual attitudes might be more implemented than the categories of 4 spiritual attitudes This third category spiritual attitude indicator can be implemented more because in the module students are always trained to relate the values of the Qur'an to the concept of physics. An example of its implementation can be seen in the discussion below:

The Concept of Kinetic Energy
in Q.S. 'Abasa : 34

يَوْمَ يَفِرُّ الْمَرْءُ مِنْ أَخِيهِ

34." on the day when man flees from his brother,"

The verse explains "man flees from his brother". While running is an example of the application of kinetic energy, because running has speed.

In contrast to the fourth category spiritual attitude indicator which is at the lowest score, because in this indicator students must be able to realize the greatness of God who regulates energy efforts, it is recognized by students that this indicator is quite difficult to implement in physics lessons. The main reason is because so far the physics learning experienced by students does not apply Islamic values. This statement is supported by research conducted by Burhanudin [22]. Burhanuddin said that physics teachers only teach physics.

Overall the average score of the spiritual attitude of students on materials of work and energy when expressed in terms of a percentage found that at the first meeting 44% then increased to 56% at the second meeting and at the 3rd meeting obtained a percentage of 77%.

Data obtained from the results of hypothesis testing using the T test obtained data showing that $t_{count} > t_{table}$. This is consistent with the hypothesis that has been proposed, namely if $t_{count} > t_{table}$, the result is H0 is rejected and Ha is accepted. Hypothesis results show that the use of physics modules integrated with the Quran values might significantly improve students' problem-solving abilities and spiritual attitudes. This is in line with research conducted by Sugiyanto et al [23], the module developed by him is able to empower problem-solving skills because in this module integrated a learning model that at each stage of learning might train each indicator of problem-solving ability.

CONCLUSION AND SUGGESTION

Based on the results of data processing and analysis of research that has been carried out at MA Al-Istiqomah class X MIA 1 and X MIA 2 regarding physics modules integrated with the Quran values to improve students' problem-solving abilities and spiritual attitudes on materials of work and energy, the students' problem-solving abilities can be obtained at classes using the physics module integrated with the Quran values have increased with N-Gain of 0.40 in the medium category. Hypothesis test results indicate that there is a significant influence of physics module integrated with Quran values on students' problem-solving abilities and the spiritual attitudes in physics learning. Therefore, The module that has been developed is able to train problem solving skills that are needed by students in the process of thinking solutions to a problem in real life and are also able to grow spiritual attitudes as an effort to fulfill the first core competence, namely spiritual competence.

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