

Increased Student Learning Outcomes at Colloidal Materials Integrated Islamic Values Through the Scientific Approach

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Abstract

The development of the current educational system, has focused integralistly that removes barriers between science and religion. But there are still many Islamic school that have not yet integrated the values of Islam in learning, so it is necessary to use a certain approach. Learning through a scientific approach has a very strategic role in improving student learning outcomes. The purpose of this research is to know and describe the improvement of student learning outcomes in the learning of colloidal chemistry integrated Islamic values through scientific approach. This research uses experimental method, with pretest and posttest control group design design. The results showed that there was an increase in learning outcomes in the control and experimental classes altogether in the low improvement category, but the improvement in both quality / statistics was no significant difference. The percentage increase in the experimental class (10.1%) was greater than the control class (5.5%). The conclusion in this research is the study of integrated colloidal chemistry of Islam through scientific approach can improve student learning outcomes.

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INTRODUCTION

Every individual needs a self-controller in thinking, acting, acting, that is religious or religious. Religious can affect every aspect of the individual's life, both psychic and physical (Reza, 2013). Good education is education that is able to develop all the nature of learners, especially the nature of reason and religion. The nature of reason will make the learners can deceive his thinking power to be proficient, intelligent, and creative. While religious nature will inculcate the pillars of goodness that will be implemented in everyday life. The cultivation of nature and religion in learning can be integrated with Islamic values (Nizar, 2011).

The development of the present educational system, has focused integralistly that removes barriers that are not only in the physical sense of the territory, but also in a broad sense (Kholidah, 2015). Today science and religion are integrated, because in essence both are not independent. Both are like a single coin that has two interlocking sides.

The linkage between science and religion is very close and inseparable. This is as admitted by M. Quraish Shihab by quoting Mutahhari's opinion that science can accelerate humans in achieving goals, while religion determines the intended direction, science adapts man to environment, religion adapts to his identity, science becomes ornament born, religion becomes inner decoration, science gives strength and illuminates the way, religion gives hope and impulse of soul, science answer question which begins with word how, whereas religion answer question which begins with word of why, science can muddy cheek owner, while religion give peace to its adherent (Shihab, 1998: 376).

This opinion is parallel to Einstein's idea of "science without religion is blind, religion without science is lame" (Mulyanto, 2006). So closely related between religion and science. Religion and science have a very close relationship and should not be separated. Science in Islam is part of religion, and religion

can be said religion if it can be understood with science.

There are two main foundations for incorporating religious values into education. First, the 1945 Constitution (version of Amendment), Article 31, Paragraph 3 (2002: 24) states, "The Government seeks and organizes a national education system, which enhances faith and piety and noble moral in order to educate the nation's life, invite ". Second, article 31, paragraph 5 which mentions, "The government advances science and technology by upholding the values of religion and national unity for the advancement of civilization and the welfare of mankind". The two laws indicate the integration of religious values in learning. The mandate of the constitution proves that the purpose of education in Indonesia is not only to develop the potential and educate it but also to form a religious person.

Based on research, religion has a significant influence on perseverance in the field of science. The study of Islam and the development of science and technology can not be separated (Amri, 2017). Science is seen as part of God's creation, so it will not contradict religion, because both come from the same source, that is Allah SWT. People who are stronger in their religious faith will get better educational results. This means Islam and science can be integrated, including in chemistry.

The above opinions and foundations illustrate the importance of studying both sciences seriously. However, based on observations on several four madrassas in Pati, it still separates the understanding of the two sciences. one of them is Madrasah Aliyah Al-Hikmah Kajen, Margoyoso-Pati who has a vision of "Madrasah Aliyah Al-Hikmah forming a superior Muslim cadre in achievement based on faith and taqwa". Based on that vision, learning in the madrasah should have an integration between Islam and science. In fact, the chemistry lessons in the school tend to be textual and have not yet integrated between religion and every lesson, including chemistry. Educators only menugug formula of the formula

and then ask the students to memorize and solve the problems, so the process of integration of science-Islam is not there.

Colloid is a class XI chemical material that many phenomena occur chemical reaction in everyday life has been outlined by God in his word, "... you will not see something unbalanced on the creation of God the Most Merciful ..." (QS Al-Mulk: 3). The verse explains that God created a multilayered or multilevel sky. Then Allah asks, is there something that is flawed or cracked in the sky? The answer is of course not. The heavens created by God are so balanced in many ways, from their color, essence and altitude. False stau colloid nature explains why the sky during the day is blue, while at the time of setting the sky in the west horizon is orange or red. This allows the implementation of chemistry learning that integrates Islamic values. Various scientific results and exploration of chemistry is still in order to get closer to Allah SWT.

Based on the problem, a learning approach that can give the initiative to ask questions, be able to answer the questions in the madiri, students can find the concept of the material taught through a series of educational activities and further study, so as to create meaningful learning by integrating Islamic values in learning. The learning approach is a scientific approach. The scientific approach is a process of learning designed so that learners actively construct concepts, laws or principles through observing stages (to identify or find problems), formulate problems, propose or formulate hypothesis, collect data with various techniques, analyzing data, drawing conclusions and communicating concepts, laws or principles found (Machin, 2014; Wiyanto et al., 2017).

According to Agus, the scientific approach is believed to be a golden tool for the development and development of students' attitudes, skills and knowledge. In approaches or work processes that meet scientific criteria, scientists put forward inductive reasoning rather than deductive reasoning. Deductive reasoning sees a common phenomenon and then draws a specific conclusion. In contrast, inductive

reasoning sees a specific phenomenon or situation to draw the conclusion as a whole. Indeed, inductive reasoning places specific evidence into the broader idea relation (Agus et al., 2016). The scientific approach is considered very suitable to be applied as a substitute of traditional approach, because this scientific approach is more emphasized to learners as subject of learning which must be actively involved, that is student can find out for themselves facts and knowledge associated with learning materials (Setiawan, 2016). The advantages of learning with a scientific approach is to make students who are told to be students who find out, from teachers who are learning resources to learn from a variety of sources, from a textual approach to the process as a strengthening the use of scientific approaches, from learning that emphasizes a single answer to learning with answers that are multi-dimensional truths, learning that prioritizes the culture and empowerment of learners as lifelong learners.

Fika Atina Rizqiana also conducted research using a scientific approach. The result of the research shows that the result of the instructional material is effective to increase the students' competence on the colloid material with the result for cognitive aspect is 31 students got the value above KKM 75 or the classical completeness 91,18%, for affective aspect 31 student or 91% got "Good" and for the psychomotor aspect 29 students or 85% received the "Good" criterion (Rizqiana et al., 2017).

Based on these studies, it can be concluded that an effective approach is effectively used in chemistry learning, including in colloidal materials. The effectiveness is shown in several previous studies, namely by increasing student learning outcomes. Therefore, this study aims to determine the improvement of student learning outcomes in colloidal materials that integrate Islamic values. While the benefits in this study obtained a model and a steady method in improving learning outcomes in learning colloid integrated Islamic values.

METHODS

The study was conducted in MA Al-Hikmah Pati on colloidal material. The research used Pretest-Posttest Control Group Design (Sukmadinata, 2012). the population used is the students of Class XI MA Al-Hikmah Pati. Sampling technique in this study is sampling saturated or total sampling (Sugiyono, 2016). The entire population becomes the sample, which is 47 students divided into two classes. Students who were used as samples were given colloid prerequisite materials.

The samples in the study that have been grouped into two groups were given different treatment, the experimental group was given a study of colloid chemistry integrated Islamic values with scientific approach, while the control group was given learning by lecture method. The experimental results can be obtained by comparing between the control class and the experimental class in the circumstances before and after the learning treatment.

The independent variable in this research is the internalization of Islamic values on the study of colloid chemistry with scientific approach. Variation of treatment of the use of colloidal chemistry learning model integrated Islamic values with scientific approach as experimental class and conventional learning as control class. The dependent variable in this research is student learning result of colloidal subject.

Methods of data collection is done by method of documentation and test method. Documentation method is used for interview data, register name, student number, and all

data needed in research. Test methods are used to determine the improvement of student learning outcomes. The test is used to measure students' knowledge of colloidal matter. The form of test used is multiple choice (PG) and description (Mardapi, 2008). The test is given to the students before and after the lesson (pretest and post-test) to measure the improvement of students' conception mastery on colloidal material and student character, both in the control class and in the experimental class. The test questions were made up of 20 multiple choice questions and 5 description questions. Student learning result data were analyzed by N-gain and t test to know whether or not there was improvement of student learning result between experiment class and control class.

RESULTS AND DISCUSSION

The data used to perform the analysis of research data is the result of student learning at the students in MA Al-Hikmah Kajen-Margoyoso Pati district before and after being given a study of colloid chemistry by internalizing Islamic values through scientific approaches to experimental groups and student learning outcomes before and after being given conventional learning in the Control group. An overview of the experimental group research data and control group is presented in Table 1.

Table 1. Pretest and Posttest Results of Experiment and Control Group

	Pretest		Protest	
	Eksperimental Group	Control Group	Eksperimental Group	Control Group
Total Students	22.00	25.00	22	25
Average Value	73.94	73.68	81.44	77.72
Standard deviation	1.73	1.84	5.92	4.61
The highest score	77.20	81.50	97.00	90.80
The lowest value	71.00	71.80	77.00	74.00
Range	6.20	9.70	20.00	16.80

Based on Table 1, the average learning achievement of the students in the experimental group before the colloidal chemistry learning was done by internalizing the Islamic values through the scientific approach was 73.9 with standard deviation of 1.7 the lowest score of 71.0 the highest score was 77.2. The average of the students' learning outcomes in the experimental group after being given an integrated colloid chemistry learning of Islamic values through the scientific approach was 81.4 with standard deviation 5.9 lowest score 77.0 highest score 97.0.

Based on the above table obtained information on average student learning outcomes in the Control group before being given Conventional learning is 73.7 with standard deviation 1.8 lowest score 71.8 81 81.5 highest value. The average of student learning outcomes in the control group after conventional learning was 77.7 with standard deviation of 4.6 as low as 74.0 and the highest score of 90.8.

The process of integrating Islamic values uses Karthwohl's theory (Lubis, 2009 19-21), ie listening, responding, rating, organizing values, and characterizing values. At the receiving stage, students are presented with stimulus of some verses of the Qur'an and the hadith that contain about chemistry, especially those that occur in everyday life. This is done as a form of effort to remove stigma about chemicals not related to religion. Then the students listened to the identification / verification and analogy presented by the teacher. The next stage of responding (the responding), students are given further stimulus through some questions asked by teachers related to Islamic values that are integrated with science. The process is able to make students look for by considering the surrounding environment, so that students are able to provide responses related to these events which then with the Islamic values. Through the process, students feel satisfied because they have found something new that is often encountered in everyday life.

At the stage of valuing, students are given a case based on the values contained in it, for

students then given the opportunity to arrange the perception according to the mindset of the students. The perception will ultimately be communicated with peers. Students are divided into groups to discuss the case with the values in it. The result of the discussion will be presented. Then at the stage of organizing the value (organization), students will have difficulty if to organize their own values, so that students need teacher guidance. The teacher gives direction to the students to always instill Islamic values in him after receiving learning by instilling the values of honest character, responsibility, discipline, and caring. In this process, continuous observation is done every time learning, so it is expected not to stop on the aspect of understanding, but also the practice in everyday life that shows its character. Last stage Characterization of Values (characterization), the stage of student value characterization is not observed continuously. Students are given the opportunity to conclude the concept of value gained in the learning process to be applied in daily life.

Analysis of pretest and posttest data of student learning result obtained by mean of pretest value of student of sample class which did not differ significantly. This indicates that the sample departs from the same state. While the data analysis of posttest end result of student learning in each class showed significant difference. Average experimental class learning outcomes are higher than average control class learning outcomes. Pretest, posttest and N-gain pre test-post test data can be seen in Table 2.

Increased student learning outcomes are known from the analysis using N-Gain score pretest-posttest. The experimental class was obtained by 0.77 with "low" and control class of 0.68 with "low" criterion. Data analysis with t-test increase showed that the results of the calculation of the two classes increased significantly.

Based on Table 2, the percentage of improvement of students' learning outcomes for the experimental group is 10.1% and the percentage of improvement in student learning

outcomes for the control group is 5.5%. The improvement of students' learning outcomes shows an improvement in student learning outcomes of colloidal materials in both experimental and control classes. Although the increase in learning outcomes is in the low

improvement category, the increase in student learning outcomes in the experimental class is much higher than the control class. Therefore, the mastery of students' concepts increases after the learning of colloid chemistry integrates Islamic values with a scientific approach.

Table 2. Summary of pretest, posttest and n-gain pre test-post test averages

Group	Average value		Improvement	Percentage of the Improvement (%)	Normal Gain (%)
	Pretest	Posttest			
Eksperimental	73.94	81.44	7.50	10.1	8.7
Control	73.68	77.72	4.04	5.5	4.7

CONCLUSION

In general it can be concluded that the internalization of Islamic values on learning chemistry can improve student learning outcomes, namely by describing the components: the concept of colloid, certain internalized Qur'anic verses, internalization description, and the characters contained therein. This internalization is applied in the learning process of colloid at the core activity stage with the order of presentation: the concept of colloid, the concept of integrated colloid of Islamic values. The presentation is so that student learning outcomes have a significant improvement. Improved learning outcomes in the control class and experiments are equally in the low improvement category, but the improvement in both quality / statistics is no significant difference. Percentage increase in the experimental class (10.1%) is greater than the control class (5.5%).

REFERENCES

- Agus, M., Budiyanto, K., Waluyo, L., & Mukhtar, A. (2016). Implementasi Pendekatan Saintifik dalam Pembelajaran di Pendidikan Dasar di Malang. *Proceeding Biology Education Conference*, 3(1), 46-51.
- Amri, M. N. (2017). Integrasi Nilai-Nilai Keislaman dalam Pembelajaran Biologi di SMA Islam Al Ulum Terpadu Medan. *Jurnal Edu Riligia*, 1(4), 231-236.
- Kholidah, L. N. (2015). Pola Integrasi Nilai-Nilai Keislaman dalam Pembelajaran Pendidikan Agama Islam pada Lembaga Pendidikan. *Jurnal At-Ta'dib*, 10(2), 92-95.
- Lubis, M. (2009). *Evaluasi Pendidikan Nilai: Perkembangan Moral Keagamaan Mahasiswa PTAIN Cet.II*. Yogyakarta: Pustaka Pelajar Bekerjasama dengan STAIN Bengkulu.
- Machin, A. (2014). Implementasi Pendekatan Saintifik, Penanaman Karakter dan Konservasi pada Pembelajaran Materi Pertumbuhan. *Jurnal Pendidikan IPA Indonesia (JPII)*, 3(1), 28-35.
- Mardapi, D. (2008). *Teknik Penyusunan Tes dan Nontes*. Yogyakarta: Mitra Cendekia Press.
- Mulyanto. (2006). *Ilmu Tanpa Agama Pincang, Agama Tanpa Ilmu Buta (Mengungkap Misteri Tuhan dan Keimanan Einstein)*. Bandung: Dzikra.
- Nizar, S. (2011). *Sejarah Pendidikan Islam: Menelusuri Jejak Sejarah Pendidikan era Rasulullah sampai Indonesia*. Jakarta: Kencana.
- Reza, I. F. (2013). Hubungan antara Religiusitas dengan Moralitas pada Remaja di Madrasah Aliyah. *Humanitas*, 10(2), 56-57.
- Rizqiana, F. A., Widodo, A. T., & Supardi, K. I. (2017). Pengembangan Bahan Ajar Kimia Berbasis Pendekatan Investigasi untuk Meningkatkan Kompetensi Siswa pada Materi Koloid. *Journal of Innovative Science Education (JISE)*, 6(1), 30-35.
- Setiawan, D. (2016). The Development of Scientific-approach-Based Learning Instrument Integrated with Red Onion Farming Potency

- in Brebes Indonesia. *Jurnal pendidikan IPA Indonesia (JPII)*, 5(1), 22-30.
- Shihab, M. Q. (1998). *Tafsir Al-Misbah: Pesan, Kesan dan Keserasian Al-Qur'an Vol.8*. Jakarta: Lentera Hati
- Sugiyono. (2016). *Metode Penelitian Kombinasi (Mixed Methode)*. Bandung: Alfa beta.
- Sukmadinata, N. S. (2012). *Metode Penelitian Pendidikan*. Bandung: Remaja Rosda Karya.
- Wiyanto, Nugroho, S.E., & Hartono. (2017). The Scientific Approach Learning: How prospective science teachers understand about questioning. *Journal of Physics: Conference Series*, 824(1), 012015.