Development of Science Teaching Materials Integrated with Islamic Values to Improve Science Learning Outcomes

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Abstract: The aims of the research were to develop instructional materials for science integrated with Islamic values, to determine the appropriateness and the effectiveness of the developed product for increasing learning output. Science learning output is consisting of attitude (religious attitudes and positive attitudes toward science) and learning achievement. This research is Research and Development (R&D) using the Borg & Gall model. Data analysis techniques using gain score, independent t-test, and MANOVA test. Instructional materials in the form of MTs student books and MTs teacher books. Product assessment of the MTs student books according to matter experts and media experts are categorized "very well". The MTs teacher books according to matter experts are categorized "good", and according to media experts are categorized "very well". Learning to use student books showed that religious attitudes had risen high (the mean gain score was 0.70), positive attitudes towards science had risen middle (the mean gain score was 0.57), and science learning achievement had risen middle (the mean gain score was 0.55). MANOVA test showed that Sig value is 0.00.

Keywords: Attitudes; Instructional materials; MTs student books; MTs teacher books; Science learning achievement

Introduction

The 2013 curriculum is a learning tool used by the government to realize national education goals. The element of change in the 2013 curriculum content standards is the emergence of core competencies. Core competencies consist of four parts, namely spiritual attitudes, social attitudes, knowledge and skills. These core competencies must be implemented in every lesson, including science subjects. Science is a science that studies natural phenomena. Othman (2014) states that natural balance will occur if three aspects are taken into account, namely integration and a balanced relationship between humans, nature and God.

Science integrated with Islamic values allows science teaching materials to be integrated with religious theory so that a strong, complementary and confirming theory will be built. Jamilah et al. (2014) shows that the integration of religious values into the learning curriculum contributes to producing good people who apply knowledge and skills in accordance with Islam.

Based on observations in the field, Madrasah Tsanawiyah still uses the same science teaching materials as Junior High Schools so it does not display the characteristics of the Madrasah itself. Kosim (2012) show that there is not much religious content found in science textbooks in Madrasah. There is only a little religious content but it is still general and not significant. From the results of the analysis of student and teacher responses, it is clear that teachers do not have the special ability to prepare their own teaching materials or have to work together with religious teachers to integrate science material with Islamic values. Based on interviews with students, data was obtained that some students considered science to be a difficult subject, less enjoyable, and their interest in science was still lacking.

Research on attitudes towards science by Akpınar et al. (2009) shows that there are significant differences between male and female students regarding interest in

science. The research results also show that students with high science achievements can develop positive attitudes towards science. Indicators of attitudes towards natural sciences used in several studies include interest, enjoyment, importance of science, science equipment, attitudes towards science teachers, science in the future, science outside of school, nature of science, value of science (Akpınar et al., 2009; Bhardwaj & Kaushik, 2014; Osborne et al., 2003). Jelen & Lockett (2014) conducted research to determine the relationship between religiousness, partisanship, and policy attitudes towards IPA. The research results show that religious variables including religious views and holy books are closely and significantly related to changes in attitudes towards science.

Steps to integrate science with Islamic values can be done by developing teaching materials for science learning integrated with Islamic values that can be implemented in Madrasas. One way that can be taken is by synthesizing general science (science, social sciences and technology) and religious knowledge (Arabic, Al-Qur'an and Sunnah) by integrating religion and science (Amin et al., 2010). Integrated Islamic education graduates are expected to have broad knowledge and a balanced personality (Lubis et al., 2009). Islamic education integrated with general knowledge will create human qualities that are balanced between general and religious knowledge.

The formulation of the problem in this research is how to develop science teaching materials integrated with Islamic values, what is the feasibility and effectiveness of science teaching materials integrated with Islamic values to improve religious attitudes, positive attitudes towards science, and science learning achievement of MTs students. The aim of the research is to produce science teaching materials integrated with Islamic values, to determine the feasibility and effectiveness of science teaching materials integrated with Islamic values to improve religious attitudes, positive attitudes towards science, and science learning achievement.

Chiappetta & Koballa (2010) define that science must be seen as a way of thinking in the search for understanding nature, as a way of investigating natural phenomena, and as a body of knowledge resulting from the inquiry process. Chiappetta & Koballa (2010) state that science is a science that studies nature in an effort to understand and form an organized building of knowledge that has predictive power and application in public. The nature of science according to the National Science Teachers Association (2003) refers to: characteristics that differentiate science based on how to obtain knowledge; characteristics that differentiate basic science from applied science and technology; process and discovery science as a professional activity;

standard definition based on reasonable evidence and scientific explanation. The non-material values contained in science include practical values, intellectual values, socio-cultural-economic-political values, educational values, and religious values (Trianto, 2010). Science learning at the SMP/MTs level is integrated science, namely a science learning approach that combines various studies in the science field into one unified whole (Department of National Education, 2008). Integrated science learning includes dimensions of attitude, process, product, application and creativity. So Natural Science is a science that studies and investigates natural phenomena and includes dimensions of scientific attitudes, scientific processes, scientific products, scientific applications and creativity obtained through a series of scientific methods, so that they can discover facts, concepts and theories of Science.

Teaching materials are a set of subject matter that refers to the educational curriculum framework used in order to achieve predetermined competency standards and basic competencies (Lestari, 2013). Teaching materials can be defined as a set of materials that are arranged systematically, whether written or not, so as to create an environment/atmosphere that allows students to learn (Mudlofir, 2012). The principles of preparing teaching materials include the principles of relevance, consistency and adequacy. The principles that must be considered in determining the scope of teaching materials are the principles of breadth and depth of material, and the principle of adequacy. Sources of teaching materials that can be used as supporting sources for the acquisition of teaching materials are textbooks, research reports, research journals, subject matter experts, periodicals, the internet, and an environment that is appropriate to the material and competencies to be achieved.

The basic framework of teaching materials includes a cover page, foreword, table of contents, glossary, introduction, learning, assessment, conclusion, and bibliography (Widodo & Jasmadi, 2008). So, the teaching materials are a set of relevant and systematically arranged material including knowledge, skills and/or attitudes used in the learning process to achieve the core competencies and basic competencies of the 2013 curriculum. The preparation of teaching material criteria refers to BSNP (2014).

Anas et al. (2013) stated that integration is an approach or process that can be used in the education sector to create a generation of civil servants who have multidisciplinary knowledge. Integration can also be defined as a combination of two or more knowledge into one unit or mutual consolidation. There are four integration models that have the potential to be applied in the science learning process in Indonesia, namely connected, webbed, shared and integrated (Department

of National Education, 2008). The scientific integration-interconnection model can take the form of several models, namely informative, confirmative, corrective, similarization, parallelization, complementation, comparison, inductification and verification (UIN Sinan Kalijaga Academic Working Group, 2006). Several integration models between general knowledge and religion have been developed, for example research by Lubis et al. (2009) and Amin et al. (2010). So integrated learning is a learning approach that integrates or combines material with the same theme, either between fields of science or between fields of science, so that the knowledge gained is more holistic and meaningful.

Ogunbado & Al-Otaibi (2013) state that Islamic values are principles and standards based on the Al-Qur'an, the Sunnah of the Prophet, and Islamic literature that are relevant in achieving religious quality. Rafiki & Wahab (2014) state that Islamic values are based on statements in the Al-Qur'an and Sunnah. Sources of Islamic teachings include the Qur'an, Sunnah, and Ijtihad (Azra et al., 2002; Halstead, 2007). The values of Islamic religious teachings include aqidah, morals and sharia (Ansari, 1983; Azra et al., 2002; Lubis et al., 2009; Othman, 2014; Rafiki & Wahab, 2014). Golshani (2003) defines Islamic values in the Qur'an as related to science. So Islamic values are principles whose truth is believed to be based on the Qur'an, Sunnah and Ijtihad in the form of aqidah and morals that serve as a guide in life.

Attitude is the level of positive or negative feelings towards an object, subject or event (Olasehinde & Olatoye, 2014). The characteristics of attitudes are that attitudes can be learned because attitudes are not innate, attitudes can be learned in society, attitudes are influenced by group norms, attitudes are interrelated with beliefs, values, likes and dislikes which can influence and change attitudes, and attitudes determine behavior (Pitafi & Farooq, 2012). The Department of National Education (2008) states that religion is the belief in the existence of supernatural powers above humans. Religious is religious in nature. Religiousness is an attitude and behavior that is obedient in carrying out the teachings of the religion one adheres to, is tolerant of the practice of worship of other religions, and lives in harmony with followers of other religions (Hasan et al., 2010). Murdiono (2010) states that religious moral values that can be developed in the learning process are the moral values of devotion, honesty, sincerity and responsibility.

Ministry of Education (2011) stated that religious attitudes are a unity of belief in religion especially learn in religious education. Religious attitudes are identified through a series of questions that try to determine religious openness, the relevance of religion in individual life, religious intensity/routine, and religiosity (Leroch et al., 2012). So a religious attitude is a positive attitude that shows belief in God and carries out these obligations as a form of divine relationships and relationships between fellow creatures of God which are realized by belief in the Creator who created the universe, divine relationships as a form of obligations of living creatures towards God. Creator, and social value as a form of relationship between fellow living creatures, or the relationship between living creatures and the environment.

Malik (2010) states that using a variety of teaching methods provides a positive attitude more effectively than other methods. Competency aspects of attitudes towards science in PISA include interest in science, support for scientific inquiry, and responsibility for natural resources and the environment (Organization for Economic Co-operation and Development, 2013). Several studies on attitudes towards IPA, namely Akpınar et al. (2009), Bhardwaj & Kaushik (2014), Mukhopadhyay (2014), Osborne et al. (2003), and Prokop et al. (2007). So, a positive attitude towards science is a positive attitude towards science objects including interest in science, the importance of science, science outside science/school subjects, and science in the future.

Achievement is the result of an activity that has been carried out, created, both individually and as a group (Djamarah, 2012). Arifin (1991) states that achievement is the ability, skills and attitudes obtained after completing a thing/activity. Ula (2013) states that learning is a series of processes that involve physical-psychological or physical activity to obtain positive changes in aspects of behavior through experience and the environment. Learning achievement is the result obtained in the form of changes in behavior from learning activities (Djamarah, 2012). Furniss (2012) explains that the assessment of students' knowledge, skills and attitudes/values that have been obtained. Feng et al. (2013) define learning achievement as a level of student success in learning material at school which is shown in the form of scores/grades obtained from the results of learning tests.

From the results of Kasirye (2009), classrooms and seating influence student learning achievement, so to improve learning achievement it is necessary to pay attention to classrooms and teacher training. Abidin et al. (2011) stated that there are many efforts made by teachers and parents to improve student achievement so that students and children can achieve success. Ula (2013) mentions several factors that can influence the learning process and outcomes, namely internal factors (physiological and psychological) and external factors (environmental and instrumental). Arifin (1991) states that the main function of learning achievement is as an indicator of the quality and quantity of knowledge that students have mastered, a symbol of satisfying the desire

to know, an indicator of students' absorption capacity (intelligence), information in educational innovation. , and encouragement for students to improve science and technology, and act as feedback in improving the quality of education. So, science learning achievement is the achievement of the results of science learning activities which are realized from changes in behavior by evaluating students' knowledge and the results are realized in the form of scores/grades.

Method

This research is development research which refers to the type of Research and Development (R and D) research proposed by Borg & Gall (1983). Assessment instrument trials include empirical trials, limited trials and field trials. Teaching materials are validated by material experts, media experts, teachers and peers. The assessment instrument was validated by material experts. The test subjects were MTs Ibnul Qoyyim Putra Bantul students. The type of data obtained is quantitative and qualitative. Data collection techniques use non-test techniques (questionnaires) and tests (compound choices). The test instrument looked for high reliability with a Cronbach's Alpha value of at least 0.7 (Mardapi, 2012), a level of difficulty (Arikunto, 1999), and a different power above 0.25.

Data analysis techniques used gain score (Hake, 1998), independent t-test and MANOVA test with the SPSS 17 for Windows program. MANOVA Test MANOVA analysis aims to determine the effect of science teaching materials integrated with Islamic values on increasing religious attitudes, positive attitudes towards science, and science learning achievement.

Result and Discussion

The initial stage of product development, namely: the preliminary stage includes needs analysis, student analysis, and literature review. The development stage is carried out by analyzing core competencies, basic competencies, indicators, and analysis of teaching material needs to determine the material that will be used. and basic competencies, table of contents, learning objectives, apperception, concept map, science material integrated with Islamic values, science info, reflection, summary, competency test, bibliography and index. The MTs teacher's book includes a cover page, foreword, table of contents, general instructions, introduction, material summary, learning stages, answer key, assessment techniques, bibliography, and index. The material used covers the interaction of living things with the environment and environmental pollution.
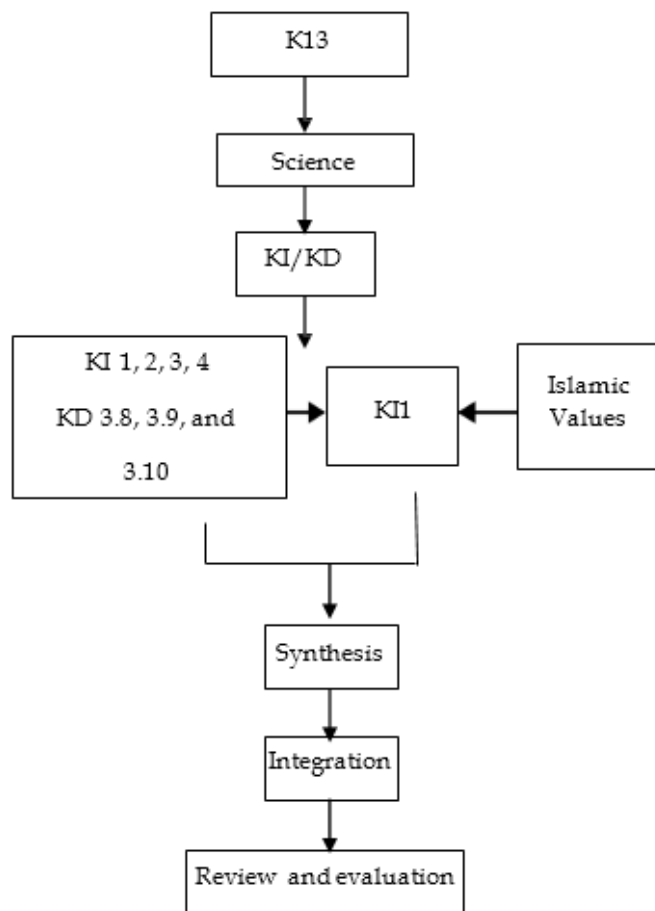

Figure 1. Flowchart Scheme for the Integration of Natural Science and Islamic Values

The stages of product development for teaching materials include MTs student books and MTs teacher books. MTs student books are equipped with a cover page, foreword, core competencies value integrated science teaching material products Islam was validated by material experts, media experts, science teachers and colleagues. The validation results are presented in Table 1.

Table 1. Validation Results of MTs Student Books and MTs Teacher Books

Validator	Students Book	Teacher Book
Materials Expert	Very Good	Good
Media Expert	Very Good	Very Good
Science teacher	Very Good	Very Good

To determine the difference between the experimental class and the control class, an independent t-test was carried out. The results of the Independent t-test analysis show that the Sig value is < 0.05, meaning there is a difference between the experimental class and the control class.

The MANOVA test was used to determine the effect of science learning teaching materials integrated with Islamic values on religious attitudes, positive attitudes towards science, and science learning achievement. The results of the MANOVA test analysis show that the Sig value < 0.05 means that there is an influence of the teaching materials developed on religious attitudes, attitudes towards science, and science learning achievement.

Normality shows a Sig value > 0.05, meaning the data obtained is normally distributed. The homogeneity test aims to show that the experimental class and control class come from populations that have the same variance (homogeneous) at a significance level of 5%. The homogeneity test uses Box's test and shows a value of 0.158, meaning the population -0.50.

The average value of increasing the gain score for religious attitudes is 0.70 with high criteria. This shows that there has been an increase in religious attitudes after the use of science teaching materials integrated with Islamic values with high criteria. Natural science teaching materials integrated with Islamic values influence religious attitudes. Pretest and posttest data.
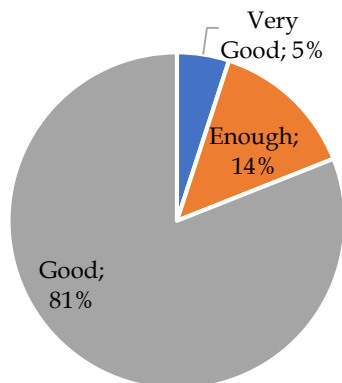

Figure 2. Religious Attitude Pretest Diagram

The average value of increasing the gain score for positive attitudes towards science is 0.57 with medium criteria. This shows that there has been an increase in attitudes towards science after the use of science teaching materials integrated with Islamic values. Science teaching materials integrated with Islamic values influence attitudes towards science.

The pretest and posttest attitude data towards science were then converted into five scale criteria. The conversion results show that the pretest attitude data towards science is that 9 students have very good criteria, 10 students have good criteria, and 2 students have quite good criteria. Posttest data on attitudes towards science showed that 21 students had very good criteria. This shows that students' attitudes show a positive attitude (very good) towards science subjects

integrated with Islamic values. The percentage diagram of positive attitude criteria towards science is presented in Figure 3.
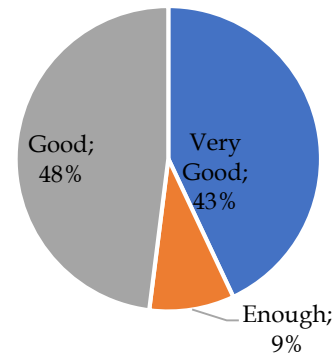

Figure 3. Pretest diagram of positive attitudes towards science

The average value of increasing the gain score for science learning achievement is 0.55 with medium criteria. This shows that there has been an increase in science learning achievement after the use of science teaching materials integrated with Islamic values. Science teaching materials integrated with Islamic values influence science learning achievement. Pretest data and the science learning achievement posttest was then converted into five scale criteria. The conversion results show that the pretest data for science learning achievement is 8 students with good criteria and 13 students with fairly good criteria, there are no students who have very good science learning achievement criteria. Posttest data on science learning achievement shows that 11 students have very good criteria and 10 students have good criteria. This shows that students' learning achievement in the knowledge (cognitive) aspect has increased to good and very good in science subjects integrated with Islamic values. The average criteria for assessing science learning achievement is very good. The percentage diagram of science learning achievement criteria.

Thus, science teaching materials integrated with Islamic values can improve religious attitudes with high criteria, positive attitudes towards science with medium criteria, and science learning achievement with medium criteria.

Assessment of science skills is obtained from the results of student performance in the form of project performance presented in front of the class. Assessment score from 0-100. The material demonstrated is the interdependence of living creatures, environmental pollution and global warming. The average science skill in the first activity was 77 in the good category, the average science skill in the second activity was 78.8 in the good category, and the average science skill in the

third activity was 81.1 in the very good category. The results of student performance are then converted to a five scale. The results obtained show that students' science skills are increasing, they can make conclusions and communicate the results of their work in front of the class.

Conclusion

Based on the results of data analysis and discussions that have been carried out, it can be concluded that the teaching materials developed are MTs student books and MTs teacher books. The feasibility of a book for MTs students with science subjects integrated with Islamic values with the title Environment (In the Perspective of Islamic Science) from material experts are in the very good category, and MTs teacher books are in the good category, while those from media experts are in the very good category so they are suitable for use as science teaching materials. The MTs student book on the science subject Integrated Islamic Values with the title Environment (In the Perspective of Islamic Science) can improve religious attitudes with an average gain score of 0.70 with high criteria, attitudes towards science with an average gain score of 0.57 with medium criteria, and science learning achievement with a gain score of 0.55 with medium criteria.

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