JISE 7 (1) 2018 : 114-121

Journal of Innovative Science Education

http://journal.unnes.ac.id/sju/index.php/jise

The Development of Chemireligiousa Teaching Material Integrated with Character Education in Chemistry Learning of Hydrocarbon Material in SMK

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Article Info

Article History:
Received January 2018
Accepted March 2018
Published August 2018

Keywords:
chemireligiousa teaching material, character education, hydrocarbon.

Abstract

Character education is very important in education. The integration of teaching materials with character education is one way that can be done. This study aims to obtain chemireligiousa teaching materials integrated character education on SMK hydrocarbon material that is valid, effective and students' response to teaching materials. The development model was a 4-D development model by Thiagarajan, Semmel & Semmel consisting of four stages: (1) Define (definition), (2) Design (Design), (3) Develop and (4) Disseminate (Spreading). The results of the preliminary study indicate that has not been found chemireligiousa teaching materials integrated education of hydrocarbon material character for students of SMK and chemireligiousa teaching materials integrated character education was indispensable in learning in vocational schools. Teaching material development results obtained a validity score of 0,94, so the criterion of teaching material was valid. The effectiveness of teaching materials was reviewed from the students' clarity completeness of 89% and the N-Gain test of 0.76 (height). Students respond very well to the use of integrated chemireligious materials teaching character education, with an overall average of 3.42. Based on the acquisition of data research results can be stated that the developed teaching materials valid, effective and get a good response from students's.

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p-ISSN 2252-6412
e-ISSN 2502-4523

INTRODUCTION

Education is an conscious and systematic effort in developing the potential of students's. Education is the best investment for the progress of a nation. One of the government's efforts in improving education is by applying the lessons that inculcate the content of characters in every learning. Character education has actually been listed in Law no. 20 of 2003 on the National Education system. Based on KEMENDIKBUD, the development of character values includes 18 values (Curriculum Center, 2010). Eighteen character values are then crystallized into five character values, one of which is the religious character. The value of the character is a reference for the government in learning, so as to create students's with knowledgeable knowledge, able to practice their religious teachings and have a moral personality.

Facts that occur at this time is a lot of students's who lack good morals among many criminal acts committed by students's. The planting of religious and moral aspects in every lesson can be done by integrating religious values. Science and religion are the two most powerful forces in the often conflicting human life. Whereas in fact, both sciences cannot stand alone but always related. The discussion of religious character is never separated from the influences of scientific and technological progress (Science and Technology). This is what causes the integration of science and religious character to be important to apply.

Religion has a significant influence on perseverance in the field of science, thus contributing to a positive increase both within and outside the academic sphere of (Ceglie, 2013) This is corroborated by Yahya in Mansour (2008) which states that the majority is significant integration between religious values and science. Science is seen to prove religious beliefs. Character education is not a stand-alone subject, but character education messages are done through science learning (Chusnani, 2013). One example is the chemistry lesson.

Integrated chemistry planting of religious characters can be done with some media, one of which is teaching materials. Development of teaching materials is the right thing to encourage the application of character education (Khusniati, 2012). Observation results at some vocational high schools in Semarang, researchers get information that chemistry book for class X SMK curriculum 2013 does not exist yet. The book used is KTSP book and not yet integrated with religious values. The use of appropriate teaching materials can provide a positive response and bring changes in the attitude of students's to the learning of chemistry. Rahmi et al. (2014) and Setyowati et al. (2013) in his research stated that the use of teaching materials is effective in improving understanding of concepts and learning outcomes of cognitive students's.

Chemistry teaching materials containing religious values that integrate character education of students's by containing Quranic verses in it so that students's can take the lessons contained in this study called chemireligiousa teaching materials (Amrullah et al., 2017). Students's will recognize the Islamic concepts related to chemistry so that students's are expected to provide stimulus to learn more about the integrated chemistry of religious character. Based on these thoughts it is necessary to conduct research on the development of chemireligiousa teaching material integrated with character education in chemistry learning of hydrocarbon material in SMK class X. So that the material obtained valid, effective and get a good response from students's.

METHODS

This research was conducted on 23 April-8 June 2018 At SMK Palapa Semarang class X. Research and development (R & D) methods have been used in this study. The development model used is a modified 4-D model as suggested by Thiagarajan, Semmel, and Semmel in Trianto (2010), which consists of define, design, develop and disseminate.

Subjects in this study are students of class X SMK Palapa Semarang School Year 2017/ 2018, which consists of three classes of TKR 1, TKR 4 and TSM 1. Design trials used is the design of One-Group Pretest-Posttest Design. The experimental design of this study involved one group (X) observed at the pretest stage (O_1) and then followed by a specific treatment and posttest (O_2). The design of this research trial is illustrated in Figure 1.

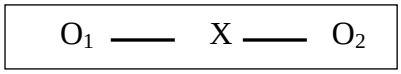

Figure 1. One-shot case study

Small-scale trials were conducted on 10 students of class X TKR 1 which aimed to obtain information on the implementation of teaching materials when applied to the learning process on a large-scale class. Large-scale trials were conducted after small-scale trials with the aim of obtaining data on the effectiveness of teaching materials including cognitive, affective, psychomotor, and students' response to teaching materials. Large-scale trials were conducted in 3 classes of 100 students's.

Data collection was done by observation method, interview, questionnaire, and test. Instrument data used are expert validation sheet, questionnaire sheet of student's response to teaching materials, effective aspect observation sheet, psychomotor aspect observation sheet and test of cognitive assessment of students. Data validation results, questionnaire responses students's, effective aspect observation sheet and observation sheet psychomotor aspects were analyzed by comparing at the Likert scale. The cognitive aspect was statistically analyzed using the N-Gain test to determine the improvement of learning outcomes.

RESULTS AND DISCUSSION

Chemireligiousa Teaching Materials

The teaching materials that are developed are chemireligiousa teaching materials integrated the education of hydrocarbon material characters in the students of SMK. Character education is essentially a process of forming the behavior of individuals to be accustomed to appreciating the importance of moral and religious values. Integrating character education in subjects is done in order to support the achievement of national education objectives. Religious character as one of the characters developed by the government is an attribute in a person or thing that shows the identity, characteristic, obedience or message of Islam (Satriawan & Sutiarso, 2017).

The integration of religious character in the subjects is developed to build the moral and religious students's. Chemistry as one of the subjects that students's learn in SMK is viewed as a subject that is often contrary to religious values. This is because in general students's assume that science and religion are contradictory (Billingsley et al., 2013). This study states that between science and religious values is an independent science. Whereas in fact, both sciences cannot stand alone but always related. The discussion of religious character is never separated from the influences of scientific and technological progress (Science and Technology). This is what causes the integration of science and religious character to be important to apply.

Ceglie (2013) in his research states that religion has a significant influence on perseverance in the field of science, thus contributing to a positive increase both within and outside the academic domain. This is corroborated by Yahya in Mansour (2008) which states that a significant majority exists in the integration of religious values and science. Science is seen to prove religious beliefs that although in detail are not scientifically interpreted. Science is seen as part of God's creation, so there is no contradiction between the two. The chemireligious material of this hydrocarbon material includes several things: 1) quoting several verses of the Qur'an relating to the hydrocarbon material accompanied by the explanation of its meaning, 2) inserting religious values in the matter and 3) giving a case containing values, religious values to be deeply appreciated and reflected by the students's.

During this time the character education of students is only applied by praying in the hours of entrance and school, the followings in spiritual activities, obedient, diligent worship and pray in congregation in school (Putri, 2011). students's are not taught religious values in every subject matter. This is due to the lack of teachers' ability to integrate the two. Chemireligiousa teaching materials in this study contain chemicals that are integrated with the religious values of students's. This teaching material is expected students's can add values of their character and their belief in Allah SWT. This teaching material is equipped with a wisdom column that is a link between chemistry and religious values in learning. Students's get the material and religious values that they can develop in everyday life. One example is the hydrocarbon material. Carbon atoms have four valence electrons capable of pairing with 4 other electrons. This further confirms that the verse is a scientific proof of the truth of Allah SWT. Allah created something with his partners, such as the poses-negative, male-female, day and night and others. The verse means that every creation of God has a partner. Likewise, carbon atoms can pair with more electronegative or electropositive atoms. As in the Qur'an letter Q.s Al-Dzariyat: 49.

وَمِن كُلِّ شَيْءٍ خَلَقْنَا زَوْجَيْنِ لَعَلَّكُمْ تَذَكَّرُونَ ﴿٤٩﴾

Meaning:

And everything We created in pairs to remember the greatness of Allah (Q.s Al-Dzariyat: 49).

Another example is the burning event. Burning is one example of a hydrocarbon reaction. Measuring the character of participants can be done by asking their beliefs about events in nature. One example of the question is "are you sure that Allah created every combustion reaction will always produce CO2 (perfect burning) or CO (incomplete burning) ?. Thus, students's can relate between the chemicals in their daily life with the religious values contained there in.

Validation of Teaching Materials

The validity of teaching material has been taken on the basis of expert judgments covering four aspects of content, construct, language and graphics. Validation has been done by three expert validators (2 lectures and 1 teacher of chemistry in SMK). In addition to assessing the teaching material, the validator is also requires to provide suggestions for improvements to the teaching material. The suggestions provided by the validator are then used as a reference to revise the developed teaching material. Data validation results of teaching material chemireligiousa integrated character education were presented in Table 1.

Table 1. Test Results validity of teaching material chemireligiousa integrated character education

No	Aspects	Validator Score			Mean	Validity Score	Category
		1	2	3			
1	Content compound	75	76	74	75	0,92	Valid
2	Construct compound	42	43	42	42.3	0,95	Valid
3	Language Compound	49	49	49	49	0,92	Valid
4	Graphical compound	114	114	114	114	0,93	Valid
	Averange					0,94	Valid

Based on Table 1 it can be explained that all components of the expert validation assessment of teaching materials get a valid rating, with an average validity score of 0,94. So the teaching material could be used for field trials.

The Effectiveness of Integrated Chemireligiousa Materials of Character Education

The effectiveness test of integrated chemireligious materials teaching character education is applied in SMK Palapa Semarang class X TKR 1, TKR 4 and TSM 1. The effectiveness of teaching materials can be known based on the results of analysis on the cognitive, affective and psychomotor competence of students's. The cognitive competence of students's is derived from the pre-test and post-test scores consisting of 20 multiple choice questions and 10 description questions. After using teaching material chemireligiousa integrated character education, students learning outcomes was > 89% as known as above the minimum completeness (75) criteria. It revealed that the effectiveness of teaching material chemireligiousa integrated character education was in good category. So, it was concluded that teaching material has been effective to be used as a learning resource in the learning process.

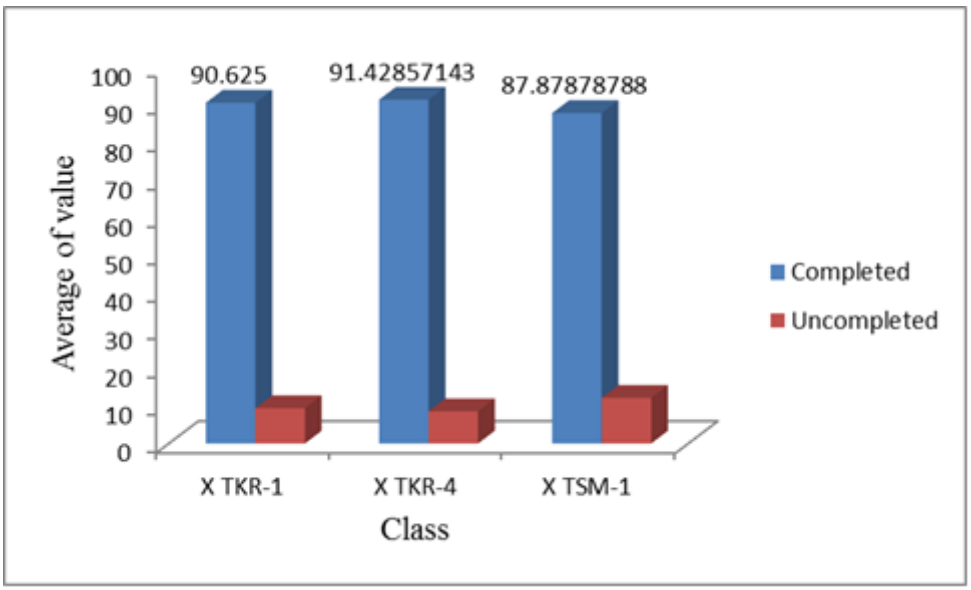

Figure 2. The average of students' learning outcomes

The cognitive learning outcomes of students's experienced an increase in learning with an average of 0.76 (height). Class X TKR 1 of 0.77 with the high criterion, X TKR 4 of 0.75 with the high criterion and TSM 1 of 0.76. The results of the N-gain test are more fully presented in Figure 3.

Based on Figures 2 and 3 shows that there is a good improvement on learning by using integrated chemireligious materials teaching character education. Amrullah et al. (2017) stated that teaching materials containing religious character education are effective in enhancing the academic and educational achievement of students's. Sudrajat & Lynna (2015) stated that the development of integrated chemistry textbook value of the character of students can improve the character of students. This is also reinforced by the opinion of Susilowati (2017) in his research which states that integrated teaching materials of Islamic values affect the learning achievement of science students's. Therefore, chemireligious materials teach integrated character education on hydrocarbon material effective for use.

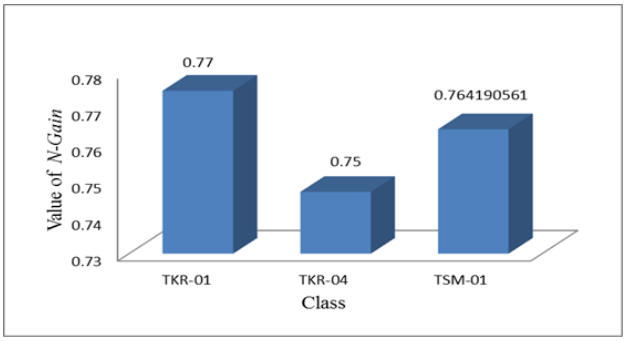

Figure 3. Improvement of learning outcomes

Character Students

The indicator of the character assessment of the students's is based on the result of a questionnaire of character measurements made sourced from the integration of religious character indicator that is adapted to the SMK hydrocarbon material. The integration of religious values (religious characters) in the learning curriculum provides positive results that contribute to producing a good human being who can apply knowledge and skills according to Islam (Jamilah et al., 2014).

Character assessment in this research is done by self-assessment, peer assessment, and observation method. The average percentage of the preliminary assessment of students's that is as much as 56%, while the average percentage of the final assessment is 80%. Based on the results of N-Gain Test it is found that the increase in the character of students's is 0.54 in the medium category. This is due to several factors such as the difficulty of measuring a person's character due to time constraints. The character should be an assessment of all subjects and in a long time. However, in this study, the authors tried to make the indicators approaching the tendency of approaching to assess the character of students's. In addition, students's start from the beginning of integrating religious values in subjects so that there is a need for habituation as in research conducted Faiziyah (2017).

Character building models to instill positive (religious) values in students's are possible in schools, even if they have relatively limited learning facilities, provided the teacher has a passion for implementing them. The commitment and willingness of teachers to develop aspects of religious values in the formation of character are very important. Teacher's commitment will be a steering and energy source in realizing the desired goals. The habit of exploring the character values of the subject matter (one of the chemistry) is an appropriate step to be improved (Anggela et al., 2013).

Results of Student Response to Teaching Materials

The result of student response data analysis showed the very good result on chemireligious materials teaching integrated character education to the students. The average results of the questionnaire in the response of students's are more fully shown in Figure 4.

Figure 4 shows that overall students's responded very well to the use of integrated chemireligious materials in character education, with an overall average of 3.42. Based on these results indicate that the overall response of students to chemireligiousa teaching materials integrated character education is very good.

These data indicate that integrated chemireligious materials teaching character education can improve the competence of students's. This teaching material can be an innovation in chemistry learning where the learning of chemistry not only emphasizes on the achievement of learning result but also the character of students's. Therefore, it takes a measuring tool that can be used to measure the religious character of students in the subjects of science (Susilawati, 2012), thus implicating the increase in learning outcomes. Improved effective and psychomotor aspects that will lead

to an increase in the value of characters can improve the faith and morality of students to the better and the results will have implications for student intelligence. As the research conducted by Benninga (2003) and Febrianti et al. (2015) that the application of the value of characters in the learning process can improve student achievement.

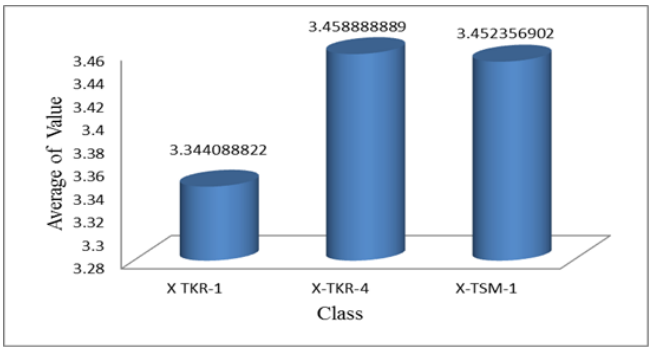

Figure 4. The average of students' response

CONCLUSION

The integrated chemireligiousa teaching materials developed character education are valid for use in learning with a validity score of 0,94. The effectiveness of teaching materials is viewed from the students' classical completeness with an average of 89% and the N-Gain test of 0.76 (high). Students's respond very well to the use of integrated chemireligious materials teaching character education, with an overall average of 3.42. Based on data acquisition result of research indicate that the use of chemireligiousa teaching materials integrated character education on class X hydrocarbon material SMK feasible and effective use of students's.

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