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Islamic Values Integrated in Chemistry Module for Senior Highschool Student in North Sumatera

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Abstact
The chemistry module which integrated with Islamic values has already developed in thermochemistry and reaction rate. The aim of this research is to find the availability of Islamic values in student's handbook, the proper of chemistry module design based on BSNP criteria, and the response to chemistry module which integrated with Islamic values to teacher and university student. This research used the method of research and development. It consists of 3 steps which were analysis, design, and development. The instruments were checklist, questionaire based on BSNP criteria, and response questionnaire. The result shown the lack of Islamic value in student's handbook, chemistry module design was proper to used because it got the BSNP's criteria. The teacher and university student's response are good and need no revision.
Keywords
Islamic values, BSNP criteria student's handbook

Abstrak
Modul kimia yang terintegrasi dengan nilai-nilai Islam telah berkembang dalam termokimia dan laju reaksi. Tujuan dari penelitian ini adalah untuk mengetahui ketersediaan nilai-nilai Islam dalam buku pegangan siswa, desain modul kimia yang tepat berdasarkan kriteria BSNP, dan respon terhadap modul kimia yang terintegrasi dengan nilai-nilai Islam kepada guru dan mahasiswa. Penelitian ini menggunakan metode research and development. Ini terdiri dari 3 langkah yaitu analisis, desain, dan pengembangan. Instrumen yang digunakan adalah checklist, angket berdasarkan kriteria BSNP, dan angket respon. Hasil penelitian menunjukkan kurangnya nilai Islam dalam buku pegangan siswa, desain modul kimia layak digunakan karena memenuhi kriteria BSNP. Respon guru dan mahasiswa sudah baik dan tidak perlu direvisi.
Kata Kunci
Nilai-nilai Islam, modul siswa sesuai kriteria BSNP

INTRODUCTION

The rule of education arranges in Government Regulation (PP) about National Education System number 20 in 2003, education is a conscious effort to form the conditioning learning teaching process for student be actively develop their potention to get the spiritual power, self control, and skills. It gives an effect to theirselves, society, nation, and country. In juridical of education of Indonesia, the goal of national education involved in Fundamental Rules in 1945, section 31 verse 3, that national education purpose to enhance faith and piety to God and also good character in educate students. In every part of education, the nation should keep the equilibration of period demand, such create enough sources for national science construction based on religion demand (Hilda, 2015).

National Education Department declare in catalogue of education, learning process of main competence-1 (spiritual attitude) do not define in basic competence in learning Chemistry. However, the result of this competence achieved in indirect teaching from knowledge and skill result. Chemistry is a knowledge which learn about structures, characteristics, material change, and also the energy that followed the changes. Mainly, chemistry talks about everything in microscopic. This phenomenon happens cause of the great and mighty God. One out of several chemistry learning purposes in Senior High School is aware with nature arrangement, beauty and praise the mighty God (Syahfitri et al., 2018).

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In deeper observation, from all of national education goals, the most important is faith and piety to God. But in fact, in learning teaching process at school still has gap between science and religion. This happened because the science teacher apatheti to religion and mostly teachers belief science free from spiritual values. While, many of thinkers, planners, and excecutors of curriculum especially teacher have no capability in prepare and teach science based on spiritual value. In addition, the limitation of reference which guide students to have faith and piety to God (Darmana, Permanasari, Sauri, & Suryana, 2013).

It is also able to foster creativity and innovation of learners in producing new technologies for the purposes of learning and education to increase the interest of learning. Some kinds of learning media may use to increase the students interest such as, module, worksheet, handout, textbook, and so on. Using module in learning teaching process could increase the students interest (Gani, Khaldun, & Bahi, 2018). Thus, it is strengthen, with other study, shown there was an improvement of students who taught by module (Ahmad, Kasmani, & Sipon, 2017). Combining the Islamic values with education is much influenced by the flow of Islam and become a major task and challenge for Muslims to recombine the integration of science and religion (Yaman & Gultom, 2017). The integration is the cognitive aspect that affects the moral planting and character formation. The purpose of the national education system can be achieved if the integration of science and religion is done since early childhood. Once the integration finished, student will have a self control (behavior) to aware that everything in this world happen because of God s will, and He is always watching all has done. This is straight to another study, the application of integrated learning provides a link between a subject with another in order to repair and improve the learning quality of learners (Demina, Effendi, & Ananda , 2018).

The goal of national education in learning teaching process could be reached with integration of Islamic values (spiritual) in the development module without vanish the knowledge of chemistry. The implementation enriched students ability in chemistry learning and the response was positive (Darmana, Permanasari, Sauri, & Suryana, 2013). There were an enhance in students spiritual and a relation between spiritual value to students learning outcome enhancement (Okmarisa, 2016). Along as the study, the integration of Islamic values in learnig teaching module were clearly delivered, relevant, and enhanced students knowledge in chemistry and religion Dermawan (dalam Mohameda & Sania, 2017). Therefore, the goal of Islamic education is to prepare students to think with their hearts as well as their minds, to try to purify their souls via *akhlakul karimah*, and to condition themselves to be able to live better lives (Mansir, 2022). Therefore, there is a need to develop another variative and functional teaching sources which apply Allah SWT verses from Quran and Haditsh to reach main competence in chemistry learning.

Based on the description above, researcher interested in receiving the purpose of this research are: 1). The proper of chemistry module design based on BSNP, 2). Criteria presented the availability of Islamic values in student s handbook, 3). The response to chemistry module which integrated with Islamic values to teacher and student.

The module is a learning tool containing materials, methods, subject learning, guided learning activities, exercises, and the systematically module evaluation designed. It should be attractive to achieve the expected competencies and independently. Modules are usually prepared in accordance with the needs of learning in certain subjects for the purposes of a specific learning process (Yuliawati, Rokhimawan, & Suprihatiningrum, 2013).

The purpose of the module provides instructional materials in accordance with the demands of the curriculum and the needs of the students. The teaching materials appropriate to characteristics of teaching materials and student characteristics, as well as setting or background of the social environment (Hamdani, 2011). The module has a range of benefits, both in terms of the student s interests and the interests of teachers. The preparation of modules was useful for students which have an opportunity to train learning individually. Learning become more attractive because it can be learned outside of the classroom. There is an opportunity to express the ways of learning according to their ability and interest. It presented the module by doing the exercises and developed student s interaction with other learning sources.

The principle that should be evolyed, such as the material prepared from easy to difficult stage to understand. The difficulties can described, from the concrete to understand to the abstract. Emphasizes repetition to reinforce understanding; positive feedback will provide reinforcement to students. Motivating is an effort that can determine the success of learning; as well as exercises and tasks to test themselves (Hamdani, 2011).

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Integration is a relationship based on a reformulation of the traditional theological ideas intensively and systematically. The relationships between religion and science were necessary clear and complex (Khaldun, 2015). Integralization science did not mean inserting the verses of the holy Quran in accordance with certain concepts in science. However, focused on how Islam as fundamental values that bound science or how the understanding of science could increase the levels of faith and piety to Allah (Farida, 2014). The integration of Islamic values with science and technology, were expected to be implemented in learning processes become more meaningful and easy to understand (Rusdiana, 2014). So, it could guide students to know, understand, appreciate, have faith, devoted, and noble in the teachings of Islam from its primary source of Quran and Hadith, through the guidance of teaching and training.

One out of several chemistry learning purposes in Senior High School is aware with nature arrangement, beauty and praise the mighty God. In deeper observation, from all of national education goals, the most important is faith and piety to God. But in fact, in learning teaching process at school still has a gap between science and religion. This happened because the science teacher apathetic to religion and mostly teachers belief science free from spiritual values. While, many of thinkers, planners, and excecutors of curriculum especially teacher have no capability in prepare and teach science based on spiritual value. In addition, the limitation of reference which guide students to have faith and piety to God (Darmana et al. 2013).

Integrating religious values in textbooks can be done in several ways, namely *basmalah* sentence in its preface; each chapter started with a Qur'an's verses related to the theme or concept to be discussed. While, explanation the meaning of the verses and associated it with the issues to be discussed in that chapter. Moreover, giving a reflection about the issues that could form the awareness and gloryfication of God, like shown the moslem scientist and insert wisdom word from Hadith (Saputro, 2011).

Method

Participants of the study were 3 chemistry lecturer of Medan State University choosed in purposive sampling requisite a moslem, guessed understand the Islamic values, and active in religious path. The teachers from 3 schools and 15 chemistry's students in Islamic Schools choosed randomly requisite a moslem. Method of the study was research and development (R&D). Data collected using checklist and questionnaire. Check list is used to identify the presence of Islamic values. Questionnaire is used to identify the proper and response to integrated module. Questionnaire used likert scale, 4 very good/valid, 3 well/quite valid, 2 less good/less valid, 1 not good/ invalid.

The framework was arranged to answer some problems that appeared from analysis needed such as arranged the instrument of module development, integrated Islamic values to module, and arranged module. The progress of module based on appropriate BSNP standard purposed to identify the proper of the module that being developed in learning teaching process. This phase contain conceptual and practical development. Conceptual devlopment was a validation process by the expert of chemistry lecturer. The practical development was teachers and chemistry students' view to integrated module.

The analysis from questionnaire were analyzed as quantitative data and processed with descriptive statistic. Descriptive statistic was used to describe data that collected without make any conclusion generally (Sugiyono, 2010). The average score was calculated from composed data by devide the total score to evaluator. Then, the average score changed to qualitative data based on assessment criteria table. In this study, the assessment scale that used was from 1 to 4, which the lowest was 1 and highest was 4. The range could be determine from the difference of highest to lowest score devided with highest score. Based on the calculation, the range was 0.75. The validity criterias that used shown in Table 1, Table 2, and Table 3 (Arikunto.S, 2006).

Table 1
Proper Criteria of Module by Validator

Average	Validation Criteria
3,26 – 4,00	Valid and need no revision
2.51 to 3.25	Quite valid and need no revision
1.76 to 2.50	Less valid, some of the contents of books need to be revised
1.00 to 1.75	Invalid and need total revision

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Table 2
Eligibility Criteria of Integrated Module With Islamic Values by Validator

Average	Eligibility Criteria
3.26 to 4.00	Very appropriate and need no revision
2.51 to 3.25	Appropriate and need no revision
1.76 to 2.50	Less appropriate, part of the book needs to be revised
1.00 to 1.75	Not suitable and need total revision

Table 3
Response Criteria to Module Based on Respondents Opinion

Average	Opinion Criteria Respondents
3.26 to 4.00	Very good and need no revision
2.51 to 3.25	Well and need no revision
1.76 to 2.50	Less good, part of the book needs to be revised
1.00 to 1.75	Not good and need total revision

RESULT and DISCUSSION

RESULT

Analysis Phase

Review of Chemistry Book for High School

The first step was reviewed chemistry books in several schools. The sample of books were choosed directly from the school. Some books were used in several schools and combined it with another book. There was school which used a single book as main handbook in learning chemistry. Books that used in each schools contained in Table 4.

Table 4
Books List Used in Each Schools

School Identity	Books Used by Each School
Al Amjad Senior High School	Books B and C
Islamic Boarding School Daarul Muhsinin	Books A and B
State Madrasah Of Labuhanbatu Selatan	Book B

Identification of Islamic Values in Chemistry Books for High School

The analyses used check list as the data instrument. It modified to check the availability of Islamic values. The result shown in Table 5 (Farida, 2014).

Table 5
Presence Of Islamic Values in Chemistry Books for High School

Rated Aspect	Book A		Book B		Book C	
	Yes	No	Yes	No	Yes	No
Writing a sentence of *Basmalah*	-	√	-	√	-	√
The integration of Quranic verses (Spiritual) relevant	-	√	-	√	-	√
Explanation of the meaning of the verses of the Quran (Spiritual)	-	√	√	-	√	-
Giving reflection	-	√	-	√	-	√
Showing Moslem scienctists	-	√	-	√	-	√
Insertion of wisdom words	-	√	√	-	√	-

Book A was not presented Islamic values, however Book B and C were presented a light at the end of each chapter of the books. Even there were books presented Islamic values, but it was in less category. This result indicated that these three books were lack of Islamic values. Book references that can increase faith and piety to God was very limited (Darmana, Permanasari, Sauri, & Suryana, 2013).

Designing Phase

Instrument Arrangement

The first step to develop module was to compile the instrument. Instrument prepared in designing integrated chemical module were the enrichment of chemistry book, Quran and Hadith as sources of Islamic values, and software like microsoft word and adobe photoshop to compile contents and module cover.

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Chemistry Module Development

The second step was compiled the development of chemistry module. Thermochemistry and reaction rates were arranged based on syllabus. In this step, material from the books was complete and has been systematically arranged. In addition, the module was equipped with examples and exercises. Generally, the layout of chemical module based on syllabus shown in Table 6 and Table 7.

Table 6
Chemistry Module Design Based on Syllabus in Thermochemistry

Sub-Main Material	Chemistry Material Design	Materials Page
Energy and heat	The initial discussion of the module, firstly begins with events that occur in everyday life so the readers were more interested in reading about the module.	3
Calorimetry and reaction enthalpy changes	There were explanations, examples of questions and complete discussion.	12
Thermochemistry equation	There were explanations, examples of questions and complete discussion.	7
Standard enthalpy changes (ΔH^{O}) for various reactions	There were explanations, examples of questions and complete discussion.	9
Average bond energy	There were explanations, examples of questions and complete discussion.	15
Determination of reaction enthalpy changes	There were explanations, examples of questions and complete discussion.	13

Table 7
Chemistry Module Design Based on Syllabus in Reaction Rate

Sub-Main Material	Chemical Material Design	Materials Page
Definition and measurement of reaction rates	The initial discussion of the module, firstly begins with events that occur in everyday life so the readers were more interested in reading about the module.	29
Collision theory	There was an explanation and relationship with other sub-material.	37
Factors that affect the rate of reaction	There were explanations and applications in everyday life.	33
The law of the reaction rate and determination of the reaction rate	There were explanations, examples of questions and complete discussion.	32

Integrating Islamic Values in to Module

Module were integrated by connecting thermochemistry materials and reaction rates according to existing Islamic values. Islamic values used were sourced from Quran and Hadith. In general, the design of Islamic values integrated into chemical modules was in accordance with the assessment aspects of (Fitriani, 2016), namely:

1. Writing a sentence of basmalah
   Sentence of basmalah in introduction.
2. The integration of Quranic verses (spiritual) relevant and explanation of the meaning of the verses of the Quran (spiritual)
   Integrating Al-Ankabut: 61 with the concept of conservation of energy, Yasin QS: 36 with system concepts and environment, At-Talaq: 3, Al-Imran: 26, Al-Qamar: 49, and Al-Kahf: 29 towards the provisions that have been created by Allah, Az-Zukhruf: 35 with the provision of Allah creating metal such as gold which is difficult to experience, not as a guarantor of the Hereafter happiness, Ghafir: 14 with factors that influence the rate of a reaction, Al-Qamar: 49-50 with factors that influence the rate of surface area. Even small particles that are invisible can continue to move because of the determination of Allah.
3. Giving reflection
4. Showing Moslem scientis
   Featuring Jabir Ibnu Hayyan as *father of modern chemistry*, Muhammad bin Zakaria Ar-Razi, and Ahmed Zewail as inventor of femtochemistry an ultrasound laser technique that has won the 1999 Nobel Prize in chemistry.

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5. Insertion of wisdom words

Ibn Abdil Barr, finding knowledge is mandatory for every male and female Muslim. *HR Bukhari*, You should be the best person who studies the Quran and does it, From Abdullah bin Mas ud, the Prophet Muhammad once said: "Do not want to be like other people except like these two people". First the person who is given Allah is abundant wealth and he spends it correctly, the two people are given Allah *al-Hikma* and he behaves accordingly and teaches it to others. *HR Turmudzi*, Whoever wants the life of the world is obliged for him to have knowledge, and whoever wants the life of the hereafter, it is obligatory for him to have knowledge, and whoever wants both of them is obligatory for him to have knowledge.

Compiling Integrated Module in Islamic Values

The final stage was integrating Islamic values into the module. In the design of this chemical module Islamic values have been integrated and the development of an integrated chemical module of Islamic values is very useful in the learning process at school. In accordance with Barbour s opinion in his book entitled *when science meets Religion* the interaction between science and religion can provide a positive and creative influence for others (Waston, 2014).

DISCUSSION

Standardization of Integrated Module Design of Islamic Values

The module was standardized by expert researchers. The experts were faculty lecturers of chemistry department and chemistry teachers. Based on BSNP criteria, it obtained with an average score of 3.39. It interpreted that lecturers and teachers gave positive responses to the development of chemical modules that integrated Islamic values. Islamic values that integrated identified with an average score of 3.5. This indicated the eligibility of Islamic values was positive. Furthermore, the development module was distributed to user respondents, teachers and students, who have studied and were more aware of the material of Themochemistry and Reaction Rate. It result an average 3.48. This indicated the response was positive. The result were shown in Table 8, Table 9, and Table 10.

Table 8
Results of Integrated Module Design Assessment of Islamic Values by Lecturers and Teachers Based on BSNP

Assessment	Score		Average
	Lecturer	Teacher	
Content Feasibility	3.19	3.23	3.21
Language Feasibility	3.36	3.53	3.45
Feasibility of Presentation	3.39	3.50	3.45
Feasibility of Integrity	3.42	3.51	3.47
Average	3.34	3.44	3,39

Table 9
Results of Assessment of Integration of Islamic Values in the Integrated Module Design of Islamic Values by Lecturer and Teacher

Assessment	Score		Average
	Lecturer	Teacher	
Writing a sentence of Basmalah	4.00	4.00	4.00
The integration of Quranic verses (Spiritual) relevant	3.33	3.67	3.50
Explanation of the meaning of the verses of the Quran (Spiritual)	3.33	3.33	3.33
Giving reflection	3.67	3.00	3.34
Showing Moslem scienctists	3.33	3.67	3.50
Insertion of wisdom words	3.33	3.33	3.33
Average	3.50	3.50	3.50

Table 10
Teacher and Student Response to Integrated Module Design Islamic Values

Asessment	Score		Average
	Teacher	University Student	
Display Aspects	3.78	3.44	3.61
Material Aspects	3.42	3.36	3.39

Benefits Aspects	3.52	3.37	3.45
Average	3.57	3.39	3.48

By looking at the identification criteria for average values, the results of the integrated module design evaluation of Islamic values by lecturers and teachers based on BSNP were in the range of values from 3.26 to 4.00. It means the module design assessment was valid and no need to be revised. The results of the assessment of the integration of Islamic values in the module design by lecturers and teachers were in the range of 3.26- 4.00 which means that the assessment was appropriate and no need to be revised. The response resulted in the range of 3.26-4.00 which means that the response of teachers and students to the integrated modules were very good and no need to be revised.

This result consistent with another study, the peer assessment responses of science teachers to the results of the development science-based teaching module in Science had a high level of effectiveness and attractiveness and reached 86,5% in the good category. Based on the description above it was found that the integrated module design of Islamic values meets the standards and can be used as a module in the material of thermochemistry and reaction rate (Hamzah, 2016). In accordance with the study, the response to Islamic-nuanced modules shows that the value of ease-of-use components gets a practical value of 96,6% with very practical criteria. The components of learning time efficiency 97,9% with very practical criteria. Wjile, the components provides the benefits for students 92,8% with very practical criteria. Overall, the data analysis of student practicality has an average value of 95,7% with very practical criteria (Taroza *et al*., 2013).

Integralization science did not mean inserting the verses of the holy Quran in accordance with certain concepts in science. However, focused on how Islam as fundamental values that bound science or how the understanding of science could increase the levels of faith and piety to Allah. The integration of Islamic values with science and technology, were expected to be implemented in learning processes become more meaningful and easy to understand. So, it could guide students to know, understand, appreciate, have faith, devoted, and noble in the teachings of Islam from its primary source of Quran and Hadith, through the guidance of teaching and training. Integrating religious values in textbooks can be done in several ways, namely basmalah sentence in its preface; each chapter started with a Quran s verses related to the theme or concept to be discussed. While, explaination the meaning of the verses and associated it with the issues to be discussed in that chapter. Moreover, giving a reflection about the issues that could form the awareness and gloryfication of God, like shown the moslem scientist and insert wisdom word from Haditsh.

Conclusion

The results of the study found that there was no lack of Islamic values in the chemistry handbook in senior high school students, the design of this integrated chemistry module was feasible because it had met the eligibility of the BSNP with an average score of 3.39. By looking at the identification criteria for average values, the results of the integrated module design evaluation of Islamic values by lecturers and teachers based on BSNP were in the range of values from 3.26 to 4.00. It means the module design assessment was valid and no need to be revised. The results of the assessment of the integration of Islamic values in the module design by lecturers and teachers were in the range of 3.26-4.00 which means that the assessment was appropriate and no need to be revised. The response resulted in the range of 3.26-4.00 which means that the response of teachers and students to the integrated modules were very good and no need to be revised. For further studies are able to implement this module or can develop integrated chemistry module with Islamic values in other material.

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