The Integration of Al-Qur’an and Hadith Studies on Biology Learning at Islamic Senior High Schools in Magelang Indonesia

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Abstract. This research aims at investigating the integration of Al-Qur'an and Hadith studies on biology learning which implements 2013 curriculum in grade X and XI of Islamic Senior High Schools (MA/ SMA Islam) in regencies and cities of Magelang to enhance the achievement of reciting the greatness of God. This is a survey research employing a census and questionnaires for data collection. The research respondents were 22 biology teachers of grade X and 19 biology teachers of grade XI. The results show that 54% of grade X teachers and 53% of grade XI teachers do not integrate Al-Quran studies when performing biology learning. In addition, 78% of grade X teachers and 63% of grade XI teachers do not integrate Hadith studies on biology learning. They do not integrate Al-Qur'an and Hadith on biology learning is mainly due to their limited information and knowledge about Al-Qur'an and Hadith related to the subject of biology. The integration of Al-Qur'an verse is mostly carried out to provide information i.e. 32% for grade X and 35% grade XI. Moreover, the integration of Hadith is also limited to give information i.e. 19% information on the biology subject of grade X and 21% for grade XI.

1. Introduction

The Indonesian National Law Number 20 Year 2003, Article No. 3 [1] on National Education System states that the objectives of national education is to develop the potential of learners to become human beings who believe and are pious to the God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. In accordance with the objectives of national education, the spiritual dimension is one of the achievements that are expected to be developed in the learners through the educational process. One of the efforts performed by the government to achieve these objectives is to make the spiritual dimension as a core competence (KI) on the Curriculum of 2013 namely KI 1 spiritual attitude.

The Regulation of the Minister of Education and Culture No. 22 Year 2016 [2] about the standard process of education has not yet explained technically about the learning process that is able to lead the learners to achieve spiritual attitude competence, so that its development can be carried out by each teacher through the learning process. In Islamic schools which have applied the basics of Islamic teachings, one way that can be performed by the teachers to develop the competence of spiritual attitudes is to integrate the Islamic values in the learning process, or by studying and relating the verses of God contained in the holy book of Qur'an and Hadith with certain topic of each subject.
Many studies have revealed that there is no conflict between science and Qur'an. Therefore, Qur'an should be presented to the 21st-century Muslim students by linking the learning subjects with Islamic sources to encourage the learners to find scientific knowledge to disclose the facts of the creation of this universe for the development of science and technology [3]. The integration of Islamic values contained in the Holy Book into the learning process has been proven to be able to reveal and invent many new things in the fields of science and technology, as has been implemented by some Moslem scientists like Al Khawarizmi, Ibnu Sina, Ibnu Khaldun and others. They were successfully able to integrate the verses of Qur’an into the educational world to develop the science and technology at their periods [16].

The Holy Quran is a miraculous book with regard to the rhetorical, legislative, scientific, historical and numerical aspects [17]. Qur'an as a holy book of Islam, besides studies the issues of religion, also examines the scientific fields, including biology. Many verses of Qur'an explain the biological phenomena that can be integrated into the biology learning process. In addition to Al-Qur'an, hadith is also a source of Islamic religion that can be a source of knowledge. Muslims believe that the Sunnah of the Prophet Muhammad (Hadith) is the second of the two fundamental sources of Islam, after the Holy Qur'an. Hadith provides a Gold Standard 'ground truth' for Artificial Intelligent knowledge extraction and knowledge representation experiments [19]. Hadith is everything that is based on Prophet Muhammad SAW, whether in the form of words, deeds, taqrir, or characters. Al-Qur'an and hadith can be studied and associated with every subject and topic in the process of biology learning to take the values and benefits, to support the achievement of core competencies to glorify the greatness of God.

Biology is a mean to improve knowledge, skills, attitudes, and values and be responsible to the environment, community, nation, country, and being faithful and cautious to God Almighty. Biology is also concerned with how to find out and understand about self, universe, and life in a systematic way. Therefore, essentially, the study of religious materials and science, especially biology has a very close relationship. Therefore, if it is integrated, it will produce meaningful learning [4]. Biology learns about facts, procedures, and phenomena related to living things and their life as the creation of God. By studying Biology, it is expected that the learners will significantly glorify the greatness of God.

Magelang regency and Magelang municipality are included in the region of Central Java. The data from Department of Education and Culture of Central Java Province (2018) show that that there are 61.2% Islamic Senior High Schools or MA / SMA. These schools have a great opportunity to implement the biology learning by studying the verses of Al-Qur'an and Hadith on its topics. There are opportunities and potential to integrate between general lessons and religious values at schools, in spite of many serious obstacles on the implementation [21]. This study aims at investigating the integration of Qur'an verses and Hadiths studies in the Biology learning that implements 2013 curriculum for grade X students of MA / SMA in Magelang regency and municipality to enhance the achievement of core competency of admiring the greatness of God.

2. Research Methods
This research is a survey research employing a census technique. The survey was conducted in all Islamic-based Senior High Schools or MA / SMA in Magelang regency and municipality that teach science subjects. The survey was carried to 23 X grade biology teachers and 19 XI grade teachers who have implemented 2013 curriculum. The instrument used in this study was a questionnaire that has been validated by the experts in terms of construction and language. The questionnaire was used to investigate whether the Biology teaching conducted by the teachers has integrated the study of Qur'an verses and Hadith or not on any topics of Biology in grade X and XI.

The data in this research were analyzed descriptively and quantitatively. The data of the research were quantitatively calculated (percentage) to know whether or not the biology learning was accompanied by the study of the verses of Al-Qur'an and Hadith. If so, the implementation was only limited to the delivery of information, question and answer and group discussion to find the appropriate verses, study the content of the verses, or through the learners’ assignments. In addition,
the data were analyzed to find out the most studied topic which was integrated with the study of verses of Al-Qur'an and Hadith. After being analyzed quantitatively, the data were processed descriptively.

3. Results and Discussions

The research data were obtained from the questionnaires that asked whether the biology teachers in Islamic-based schools or MA / SMA in Magelang regency and municipality have implemented the biology learning by integrating the study of Qur'an verses and Hadith on the topics of biology subject for the grade X and XI students or not. The results of the research on the integration of Al-Qur'an verses and Hadith studies on the topics of biology are presented in table 1.

Table 1. The Integration Al-Qur’an verses and Hadith on the Topics of Biology Subject

| No. | The Integration Al-Qur’an verses and Hadith on the Topics of Biology Subject | Integration of Al-Qur’an Study | Integration of Hadith Study |
|-----|--------------------------------------------------------------------------------|-------------------------------|-----------------------------|
|     |                                                                                  | Class X | Class XI | Class X | Class XI |
| 1.  | Unimplemented                                                                    | 54%     | 53%     | 78%     | 63%     |
| 2.  | Performed only as a delivery information                                         | 32%     | 35%     | 19%     | 21%     |
| 3.  | Question and answer session to find the appropriate verses                       | 6%      | 3%      | 2%      | 4%      |
| 4.  | Group discussion which was conducted to find the appropriate verse               | 4%      | 1%      | 0%      | 0%      |
| 5.  | Group discussion which is conducted to review the content of the appropriate verse| 4%      | 5%      | 1%      | 1%      |
| 6.  | Performed as a homework of reviewing the appropriate verses and clarification of the content of the verses during classroom meetings | 0% | 3% | 0% | 0% |

Based on the data above, it is found that 54% of grade X biology teachers and 53% of grade XI biology teachers in MA/SMA in Magelang regencies have never carried out the integration of the Qur'an verses studies on their biology learning. This is similar to the integration of hadith studies on biology learning in which 78% of grade X and 63% of grade XI teachers do not yet perform the integration of hadith studies on the biology learning. Those who have implemented the integration of Qur'an verses studies are only limited to the delivery of information, i.e. 32% in grade X and 35% in grade XI. The same thing also happens for the integration of Hadith studies where it is only limited to the delivery of information i.e. 19% in grade X and 21% in grade XI.

Based on the results of interviews with some teachers who do not integrate the study of Qur'an verses and Hadith on the Biology learning, there are some main reasons why they do so: 1) They have no knowledge about Qur'an verses and Hadiths related to the topics of biology, and 2) there is no textbook as the learning resource that integrates the verses of Al-Qur'an and Hadith with the topics of biology learning. This condition is in line with the results of Kosim's research indicating that there are not many religious contents found in textbooks of scientific subjects (especially biology) in Madrasah (Islamic schools). There have actually been few but they are still general (not specific) and insignificant [5].

The teachers who integrate the study of Qur'an verses and Hadith on the topics of biology state that not all topics can be taught by integrating the verses of the Qur'an and Hadith. Table 2 and 3 present the data on the integration of Al-Qur'an verses and Hadith on the subject of biology that has been performed by the teachers of MA / SMA grade X and XI in Magelang regency and municipality.
Table 2. The Integration of Al-Qur’an Verses and Hadith studies based on the Topics of Biology subject for Grade X

| No. | Topics                     | Integration of Al-Qur’an Studies | Integration of Hadith Studies |
|-----|----------------------------|----------------------------------|-------------------------------|
| 1   | Scope of Biology            | 57%                              | 29%                           |
| 2   | Biodiversity                | 67%                              | 29%                           |
| 3   | Classification of Living Beings | 43%                          | 10%                           |
| 4   | Virus                       | 38%                              | 24%                           |
| 5   | Monera                      | 33%                              | 24%                           |
| 6   | Protista                    | 38%                              | 19%                           |
| 7   | Fungi                       | 33%                              | 14%                           |
| 8   | Plantae                     | 62%                              | 24%                           |
| 9   | Animalia                    | 57%                              | 33%                           |
| 10  | Ecology                     | 57%                              | 24%                           |
| 11  | Environmental Change and Waste Recycling | 57%                        | 29%                           |

Table 3. The Integration of Al-Qur’an Verses and Hadith studies based on the Topics of Biology subject for Grade XI

| No. | Topics                     | Integration of Al-Qur’an Studies | Integration of Hadith Studies |
|-----|----------------------------|----------------------------------|-------------------------------|
| 1   | Cell                       | 56%                              | 33%                           |
| 2   | Plant Tissue                | 28%                              | 11%                           |
| 3   | Animal Tissue               | 39%                              | 11%                           |
| 4   | Motion System               | 50%                              | 33%                           |
| 5   | Bloodstream System          | 56%                              | 28%                           |
| 6   | Digestive System Food       | 67%                              | 39%                           |
| 7   | Respiratory System          | 61%                              | 28%                           |
| 8   | Excretion System            | 50%                              | 33%                           |
| 9   | Regulatory System           | 50%                              | 22%                           |
| 10  | Reproduction System         | 61%                              | 28%                           |
| 11  | Immune System               | 33%                              | 17%                           |

Based on the data presented in Table 2 and 3 above, it can be described that biology teachers of grade X MA / SMA in Magelang mostly integrate the Qur’an verses studies on the topics of Biodiversity, while Hadith is integrated on the topics of Animalia. In addition, the teachers of grade XI mostly integrate Al-Qur’an verses studies and Hadith on the topic of the Digestive System. According to them, there are several verses of Al-Qur’an and Hadith that are relevant and closely related to the topics.

The constitutional mandate implies the necessity of integrating religious values in the learning process, especially in science to achieve the objectives of national education in creating human beings who believe and are pious to God. However, in fact, there are some indications showing that the dichotomous fluctuations of science learning at schools are separated from the integration of Islamic values, so that the students become the knowledgeable but unreligious generation. Science as the knowledge which is related to the understanding of the nature should be consistent with the Islamic teachings sourced from the Qur'an and Hadith. The development of science without religion is blind so that the development goals and education to generate human’s welfare and prosperity will not be achieved. Meanwhile, the religion without knowledge is paralyzed, because the religion’s demands cannot be implemented without proper implementation of science and technology [18].
it is necessary to integrate the values in science learning, especially in biology, by combining the Islamic values that exist in the Qur'an and Hadith [15]. The verses of the Qur'an and Hadith can be integrated into biology learning. Through this way, it is expected that the Islamic values can be integrated in every process of science learning at the schools to create the students who have strong faith and piety to the God Almighty.

The Qur'an is the most perfect reading. The Qur'an is *Al-Furqan*, or book of distinction between the lawful and the haram, between the good and the bad, between the mandatory commands and the prohibitions to be abandoned. Al-Qur'an is *Al-Dzikr* or book of warning for mankind to always remember to his Lord, remember all his commandments and all his restrictions. Al-Qur'an is Al-Huda, revealed to mankind as the book of direction in performing his duties as *khalifatullah fi al-ardhi*, as the khali‘ah of Allah on earth. Qur'an is *Al-Mau‘idhah*, as the book of advice. Qur'an is *Al-Syifa‘*, since it can serve as healer or medicine or as a bidder for the troublesome diseases. The Qur'an is *Al-Hikmah*, or the book of wisdom which contains verses about wisdom that are urgently needed by mankind. Qur'an is *Al-Khair*, or book of goodness which gives guidance to mankind about the goodness that comes from Allah SWT. The Qur'an is a miracle that can be seen from various aspects [18].

Al-Qur'an is not only a guide for a particular people and for a certain period of time, but becomes a universal and time-guided instruction. Al-Qur'an always exists in every age and place. Its guidance is very broad, like the extent of humanity, and covers all aspects of life. Not only are Islamic sciences unearthed directly from the Qur'an, such as *tafsir*, jurisprudence and *Tauhid*, but Qur'an is also a source of science and technology, because there are so many signs of Qur'an who talks about the issues of science and technology and other fields.

Reflecting on the revelation that first came down to the Messenger of Allah, Allah proclaimed and encouraged men to seek and explore knowledge, i.e. with the words "*iqra* (read)" (Q.S. Al-'Alaq: 1-5). This signifies that Islam highly values the importance of science and education [13,14]. Thus, there have been various scientific and technological fields created through the spirit of Qur'an. More and more in exploring the verses of the Qur'an, more and more also found this guidance. That is because the Qur'an will not be inexhaustible even if written in seven broad oceans (Q.S. Luqman: 27) [11].

The guidance and suggestions for studying Qur'an and exploring its contents and spreading its teachings in the practice of community life is a never-ending guide. Facing the challenges of secular and materialistic modern world, Muslim people are required to demonstrate the guidance and teachings of Qur'an that are capable for fulfilling the vacuum of humanity and spirituality, in addition to proving rational Qur'anic teachings and encouraging human beings to achieve welfare and prosperity.

Besides Qur'an, in Islam, Hadith is also used to determine the law and reference of life patterns, because it acts as the second source as well as the form of commentary and explanation of the Qur'an. Moreover, Hadith is also applicable, because the elements in the Hadith, other than a part of the revelation, are also a form of responsibility to the problems that arise, because Hadith is the interpretation and summary of the Prophet Muhammad SAW. Therefore, in the concept of Islamic education, Hadith is a philosophical foundation in systematics development of Islamic education, particularly about morals and education [6]. Hadith is everything that is based on Prophet Muhammad SAW, whether in the form of words, deeds, *taqrir*, or characters. The Hadith is also the source of science, religion, humanity, and social needed by humans to straighten their ways, correct their mistakes, or complement their experimental knowledge. *Sunnah* also contains information about events related to the future so that it can be used as a source of knowledge, including biology [15].

There are several benefits and wisdoms that can be obtained if the study of biological is integrated with the study of Al-Qur'an verses and Hadith. Jelen& Lockett research shows that religious variables which include religious views and scriptures are closely and significantly related to the better changes in the attitude of learners [7]. The integration of religious values into the learning curriculum contributes to creating good human beings in applying knowledge and skills according to Islam [8, 10]. Through the introduction and understanding of the verses of Al-Qur'an and Hadith, it is expected to provide benefits as follows:
• Obtaining scientific facts that have not yet been proven by modern science
• Strengthen the faith through the revelations that have come before the modern science
• Recognizing Allah through the power of His creation. Without linking the Biology learning with the study of Qur'an and Hadith, the learners will only learn the scientific facts. Al-Qur'an, in describing natural phenomena, includes Allah as the Subject of the Creator and includes the elements of contemplation (e.g: Do not you think about it?) so that the readers can deepen the characters of God as the Creator of the natural phenomena.
• Assessing whether the development of technology have been in accordance with the Islamic principles. Without linking Biology learning with the study of the Qur'an and Hadith, the learners are not facilitated to capture any information on whether the technological development has been in accordance with Islamic principles. They will get stuck in support of these technological developments despite contradicting Islamic principles. Education that ignores religious principles violates the rights of the learners to worship according to their own religions and belief.
• Studying natural phenomena comprehensively. The natural phenomena described in Qur'an are not only physical-ecologic, but also explained from psychological, ethical, legal, and social aspects of life. For example, the Qur'an does not only explain human growth from sperm and ovum encounters to childbirth, and then matures, ages, and dies and then revives, but also widely explains about the biological links toward marital, divorce, and social community relationships [9].

In accordance with the mandate of Article 3 of Law No. 23 of 2003 on the National Education System, the biology teachers also have a significant contribution in achieving the objectives of national education. The biology teachers play role in developing the potential of learners to become human beings who believe and are piety to God Almighty, morality, healthy, knowledgeable, capable, creative, independent, and become citizens of a democratic and responsible which can be realized through the learning process. The Biology subjects are means to improve knowledge, skills, attitudes, and values and are responsible to the environment, society, and nation, country, and being faith and cautious to God Almighty. Biology is also concerned with how to find out and understand about self, universe, and life in a systematic way. So, essentially, the study of religious materials and science, especially biology, has a very close relationship and if it is well integrated, it will generate meaningful learning [4].

Through the biology learning, it is expected that the learners will have a conviction on the nature of His Creation and the majesty of God Almighty. To achieve the above goals through biology learning is something that is rational and appropriate because many verses of Qur'an are commanding that we (humans) think of some signs of His Greatness through the creation of the heavens and earth, as well as various natural phenomena and events (see QS Ali Imran, 3: 190- 191; Nuh, 71:13-20; An-Naml, 27:70) [11]. In addition to that reason, indeed biological science is essentially a body of knowledge that studies, understands, and investigates natural events or phenomena (natural worlds) with all its empirical aspects using scientific methods that contain the skills of the scientific process.

There are many scientific values that can be emphasized when we help the learners to carry out the scientific process and when studying the scientific contents in the classroom. Six of them are special values that appeal to the teachers: value of truth, freedom, not easy to believe (skepticism), originality in thinking and expressing opinions, orders, and communication. These six values are not only required in science, but in all other areas of human understanding. The other values contained in science are religious values that can be developed, for example, by inserting Qur'an verses (kauniyah) which are relevant to a certain topic or subject in the science learning.

The science (especially biology), according to Islam, should contain a marvelous natural wonders, along with their ordered, orderly, and harmonious laws. So, in addition to playing an important role in generating various technologies and products, the biological science also serves as a medium to recognize and remember (tafakkur) to the God (Allah SWT). The commands to spend and contemplate God's creation in the heavens and on earth are also found and commanded in the Qur'an and Hadith.
[12]. Thus, the integration of the study of the verses of Al-Qur'an and Hadith on the topics of biology subject needs to be realized to grow the students’ religious values in order to achieve the objectives of national education.

4. Conclusions and Suggestions
The conclusion of this research is that not all Biology learning processes conducted in MA/SMA (grade X and XI) in Magelang regency and municipality have integrated the studies of Al-Qur'an and Hadith verses. Those who have integrated the study of Qur'an verses and Hadith are only limited to the delivery of information to the learners.

The suggestions offered in this research are: 1) the government--in this case, the Department of Education and Culture or Ministry of Religious Affairs in the District and the Municipality of Magelang--should conduct more workshops or trainings for the Biology teachers on the learning methods that integrates the study of Al-Qur'an verses and Hadith, 2) there should be books or other sources related to the Qur'an verses and Hadith that are fitted with the topics of Biology and can be used as references for the teachers in learning process.

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