

Integration of Tauhid (Faith) Element in Biology Education

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Abstract. Tauhidik science is one of the Islamization of Knowledge efforts in the field of education. This effort was initiated by many Islamic scholars to fight against secularism. To implement the elements of faith (Tawhid) in Science Education, Al-Qur'an is the ultimate guide. The aim of this concept paper is to describe the elements of faith in biology education. In this concept paper, the definition of Tauhidik Science is specified. Next, the strategy of integration of Tauhidic element in Biology is explained. The concept paper also proposes that the implementation of elements of faith made in more in-depth for each subtopic studied. The implementation of Faith element in Science Education is expected to produce a generation whose life is guided by the Quran and have Ulul Albab thought which means having a deep rooted knowledge and strong belief to Allah s.w.t, thus forming the next generation that brings prosperity to the mankind.

Keywords: *Biological science, Education, Integration strategy. Islamisation of knowledge, Tawhidic science.*

1 Introduction

Al-Quran is a book revealed by Allah S.W.T as guidance to mankind in their life. It is the basis for developing a thoughtful mind, forming a faithful community and produces a devoted generation to Allah S.W.T. Qur'anic Generation is a generation who understand and practice the religion, learned the Qur'an, do not drown in materialism agenda and have nobility of character as embodied in the teachings of Islam. This generation is the concept of 5M (Sabri Mohamad Sharif, 2009) that reciting (*membaca*) the Qur'an, memorizing (*menghafaz*) the Qur'an, understanding and mastering (*memahami dan menguasai*) the the Quran, appreciate (*menghayati*) the teachings of the Qur'an and learn (*mempelajari*) the beauty and the height of the word in the Qur'an.

The development of human civilization witnessed the separation and isolation of knowledge to the concept of worldly and hereafter (*ukhrawi*) knowledge known as dualism system. In effect, the religious subjects are

"barren" of the aqli values and science subjects are left "free" of the naqli values (Zetty Nurzuliana Rashed & Ab. Halim Tamuri, 2014). Without the religious and cultural values in education in general and science education in particular, a generation which is well-educated but ignoring the humanity is born causing white collar crime, corruption, breach of trust and even murder occurred to ensure that their goals is reached (Othman, 2013). Today, the issue of corruption and abuse of power are widely reported in the media. For example, the Anti-Corruption Commission press release on October 5, 2016, entitled "The MACC hold 4 people, including two civil servants involved in corruption, seizing cash of RM 53 million". High-profile cases involving millions of ringgit instead of involving those who are not educated, they even held high positions in the government. Thus, the high level of education could not guarantee to produce a righteous and ethical person.

Thus, one of the efforts made by the present Muslim scholars form a Qur'anic generation who live by the faith is through the Islamization of Knowledge. Islamization of knowledge nowadays began in the 1970s. It was pioneered by Islamic scholars such as S. M. Naquib al-Attas and Ismail R. al-Faruqi. The Islamization movement was driven by the desire of Muslim scholars to fight secularism. Islamization of knowledge is embodied in various fields such as economics, sociology, politics, education, linguistics, including science and technology (Ahsan, Shahed & Ahmad, 2013). Islamization of science is an attempt to apply the elements of faith and religion in science. This effort is in line with the National Education Philosophy which focused to integrate the intellectual, spiritual, emotional and physical balance inside the next generation student (Normaya Md Zamri & Zanaton Hj Iksan, 2016). Nevertheless, science education today is still not integrated with the context of religion and divinity. Even in religious schools, the religion and science subjects are still taught separately. Only a few teachers who have the knowledge and skills were able to integrate both of these elements in one subject.

According to the Malaysian Education Development Plan 2013-2025 (Kementerian Pendidikan Malaysia, 2013), the third shift of the eleven major shifts to transform the country's education system is 'to create Malaysians with the appreciation of values'. Apart from leadership skills, students need to have the appreciation of universal values such as integrity, compassion, justice and loving to guide them in making ethical decisions to face of the worsening global challenges. Thus, the integration of science with the concept of Tawhid is believed to form a balanced student which is not just thinking about the material and worldly things, but even made their decisions based on the religious guidance and values.

Fagan (2006) stated that the practice of religion is improving the health, academic achievement, and economic well-being and foster self-control, self-esteem, empathy, and compassion which in turn benefit the individual,

family, community and the country. Therefore, religion and belief in God's existence is important for the students to adopt in the early stage so that such problems do not become a cancer that will damage future generations. The belief on the existence of God is able to guide students so that all their actions are based on religion and values and not be easily influenced by material interest thus leading to the welfare of the world and the hereafter.

This paper aims to define the concept of Tauhidic science, explained the implementation strategy of Tauhidic element in Science and proposed ways to strengthen Tauhidic science education through narrative approach. Five implementation strategies are proposed along with examples which are relating scientific phenomena with the verses of Qur'an and Hadith, attributing the phenomenon of science with the power and wisdom of God the Creator, the greatness of Islamic scholars of the past, through advice and moral values and the use of information and communication technology.

2. Methodology

Definitions of Tauhidic Science

Science is taken from the Latin word, *scientia*, which means knowledge (Medawar 1984; Mohd Yusof Hj Othman 2013). Science means 'a systematic and formulated knowledge,' 'systematic study based on observation and experiment' and 'the search to rationally explain the phenomena of nature'. Therefore, science can be defined as the knowledge of how humans perceive and observe the world naturally and systematically and further argued and analyzed logically and objectively. In addition, the experiment is also performed and the results are compared with theoretical assumptions. The knowledge of science is fostered and expanded thereby increasing the wealth of scientific knowledge (Mohd Yusof Hj Othman, 2014).

Tawhid refers to the nature of Allah S.W.T which is the One and Only God and refused and denies the existence of something similar and identical or associate with Him. It rejects assaying God - whether in nature or appearance - into parts that are more basic or small fragmentary nature. Indeed, to the absolute Oneness belongs only to Him (Wan Mohd Aimran Wan Mohd Kamil, 2012). According to Mohd Yusof Hj Othman (2014) and Abdullah Basmeih (2001), Tauhid concept can be seen clearly through Surah Al-Ikhlâs (112) which means:

'Say: He, Allah, is One (1). Allah is He on Whom all depend (2). He begets not, nor is He begotten (3). And none is like Him (4).'

Al-Qur'an (112: 1-4)

In studying the faith, four main elements are discussed, namely Uluhiyyah (divinity), Nubuwwah (prophetic and apostolic), Ruhaniyyah (related to Angel and Jin) and Sami'yat (hereafter, the grave, reward and punishment). Uluhiyyah aspect can be proven through Naqli evidence (the argument referred from the Qur'an) and the Aqli evidence (arguments based on logic and natural phenomena) (Mohd. Arip Kasmoo 2000). Thus, Wan Mohd Aimran (2012) defines Tauhidic Science as 'an attempt to provide the properties that characterize the faith to the knowledge of science'. Tauhidic Science stressed that the existence of God Allah S.W.T as The Almighty Creator of this world. Mohd Yusof Hj Othman (2014) explained that there are three main entities within the Tauhidic Science framework which is God, man and nature. This is different from conventional science which denies the entity of God. Therefore, Tauhidic Science can be defined as learning about science and natural phenomena based on observation and experimentation based on belief that the natural world was created by Allah S.W.T and all creation bowed under his power.

3. Results and Discussion

3.1 Integration Strategy of Tauhid Elements in Biology Education

Past and present Ulama' (scholars) agreed that the method of knowing Allah S.W.T is by researching, studying and thinking about Allah's creations that exists in this universe and also by recognizing the names of Allah S.W.T. Through reading and studying the Qur'an, Sunnah and creatures created by Allah, S.W.T., we are able to recognize and believes the existence of Allah S.W.T. (Mohd. Arip bin Kasmoo, 2000). It is described in the Qur'an as follows:

'Say: Consider what is it that is in the heavens and the earth; and signs and warners do not avail a people who would not believe.'

Al-Qur'an (10: 101)

Through this verse Allah S.W.T commands the human to observe nature to find evidence of His Existence and Majesty. To gain conviction in Allah (faith), humans can achieve it through the senses and the intellect. God commanded human to find the proof and evidence in order to be faithful and study it as stated by God in His verse.

Therefore, several strategies can be done by teachers to implement and integrate the elements of faith in science. Among them is to associate learning topic on various scientific phenomena with the verses of the Qur'an. Second, teachers can combine science with faith by linking every event, phenomenon, and any situation related to science with Power and

Wisdom of Allah S.W.T. Next, the greatness of previous Muslim scholars and the glory of past Islamic civilization a long time ago need to be narrated to the students in order to motivate them in their studies so that the glory can be regained one day. In addition, teachers can also associate the elements of faith with science by giving advice and stressed the values other than facts and concepts when teaching science subjects and using information and communication technologies to strengthen the integration. The following sections explained more on these strategies.

3.2 Associating Science Concepts with verses of the Qur'an and the Hadith

Al-Qur'an is the greatest miracle revealed by Allah to the people (*Ummah*) of Prophet Muhammad S.A.W. It is preserved since it was revealed over 1400 years ago, even its content is still relevant and provides guidance for mankind in the past, present and forever. Analysis of the Qur'an by Karran Sayid Ghanim stated that there are more than 750 verses in the Qur'an related to science compared with no more than 150 verses related fiqh and shari'a (Mohd. Arip bin Kasmu, 2000). It is amazing because the Qur'an was revealed over 1400 years ago during which the scientific facts has not yet been discovered. Natural phenomena that occurred can be explained and understood by in accordance with the Qur'an either textually or contextually. For example, when the teachers teach about reproduction, they can associate it with a verse from the Qur'an related to embryology (Mohd. Arip bin Kasmu, 2000) which reads:

'And certainly We created man of an extract of clay. Then, We made him a small seed in a firm resting place. Then, We made the seed a clot, then We made the clot a lump of flesh, then We made (in) the lump of flesh bones, then We clothed the bones with flesh, then We caused it to grow into another creation, so blessed be Allah, the best of the creators.'

Al-Qur'an (23: 12-14)

This verse clearly describes the creation of man in the womb of the mother starting from the ovum and the sperm to the fetus which already resembled the human form. What is impressive is that this verse was revealed over 1400 years ago; in which the related knowledge of embryology is still undiscovered yet.

In addition, there are also chapters that can be linked to Al-Qur'an indirectly. For example, when teaching about the Coordination and Response About the the nervous system and neurons, the issue of alcohol abuse may be associated with a verse from the Qur'an related to the prohibition of alcohol in Surah Al-Baqara verse 219 which means: *'They ask you about intoxicants and games of chance. Say: In both of them there*

is a great sin and means of profit for men, and their sin is greater than their profit...'. This matter is also studied by Shafiah Abdul Rashid et al. (2014) that integrates Tauhidic Science education in the chapter about the use of alcohol. He highlighted the issue of the scope of study that is too short for the issue of alcohol abuse in Science, Biology and Chemistry subject. Therefore, she suggested the teaching of that subtopic is integrated with the Qur'anic approach. His concept paper describes the definition of wine and alcohol, the prohibition of alcohol in Islam and the disadvantages of alcohol scientifically and socially. Thus, this approach is expected to integrate the elements of faith gradually in the teaching and learning of Science and Pure Sciences.

3.3 Associating Science phenomena with the Power and Wisdom of Allah in Creating

Tauhidic Science emphasizes the existence of God which is Allah S.W.T as the creator of all beings. This creation is very complex. Only by observing and learning it carefully and profoundly, these phenomena can be understood more clearly. This way, the Power and Wisdom of Allah can be appreciated clearly. This is described in the Qur'an in the following verse;

'Most surely in the creation of the heavens and the earth and the alteration of the night and the day there are signs for men who understand. Those who remember Allah standing and sitting and lying on their sides and reflect on the creation of the heavens and the earth: Our Lord! Thou hast not created this in vain! Glory be to Thee; save us then from the chastisement of the fire.'

Al-Qur'an (3: 190-191)

This verse urges Muslims to always remember Allah and think about natural phenomena thus stimulates its followers to become scientists who conducted the study in accordance with the Qur'an (Faszly Rahim et al., 2014). For example, as the teachers teach the process of cell division. Before cells divide, the information in DNA must be copied one by one through a process called replication. Millions of bases of DNA must be copied in the correct order without any errors. This process is performed by several types of protein molecules in the form of enzymes that work in perfect order and without our realization. Similarly, it can be seen in the process of protein synthesis by the cells in ribosome. The process began with the transcription of DNA to mRNA and then translation of mRNA to the protein chain. This process occurs perfectly without any mistakes. Who set up all these processes? Are the protein molecules having the wisdom to do all these things? By studying in depth, natural phenomena can be interpreted based on the Wisdom and Power of Allah S.W.T, rather than occurred through natural selection or accidentally by chance as it is believed by groups of scientist now.

In addition, teachers can also integrate belief in the Greatness and Power of Allah S.W.T by organizing tours and camps. The study of this subject was made by Zanaton Hj Iksan et al. (2015) through View Nature Camp (*Kem Pandang Alam*) conducted on Faculty of Science and Technology students that take the Tauhidic Science courses at the undergraduate level. A total of 32 respondents participated in this camp and the study was conducted by analyzing the reflections made during the camp. During this camp, as the participants are trekking the jungle, the facilitators will present the verses of the Qur'an that are clearly associated with the observed phenomena around them at certain checkpoints. The theme of reflection is obtained through constant comparative analysis. Among the themes raised is to see, feel and ensoul the Greatness of God thus creates a feeling of gratitude. As a result, the lesson is taken to be implemented in everyday life. The findings revealed that this camp can create an atmosphere of embracing (*tadabbur*) Qur'an through experience the feeling of appreciation of the Qur'an. It can be concluded that, by organizing camps and visits, students can observe and feel the experience and appreciate the Greatness of Allah S.W.T.

3.4 The Greatness of the Past Islamic Scholars

The present Islamization of Knowledge can be said to be new, but generally it is agreed that it dates back to the revelation of the Qur'an to Prophet Muhammad S.A.W over one thousand four hundred years ago (Ahsan et al., 2013). The first verse that was revealed was Surah Al-Alaq verse 1-5 that emphasizes the instruction to read (Mohamad Faizal et al., 2014). Reading is the foundation for gaining knowledge. Hence, Muslim scholars have worked hard, studied and translated writings of early Greek philosophers as well as knowledge of other civilizations such as Persia, India and China in their efforts to deepen the knowledge. The result of their hard work, various branches of knowledge emerge such as philosophy, theology, mathematics, fiqh, astronomy, law, mysticism (*tasawuf*), logic, metaphysics, physics, chemistry, architecture, geography and many more. Subsequently in the golden era of Islamic civilization, many Islamic scholars were born who not only mastered just one area, but a variety of disciplines including science and technology.

Islam reached its heyday in the ninth century to the sixteenth century AD. The height of this civilization could not be achieved without a high mastery of knowledge. Quran also has stated this in the verse;

'Allah will exalt those of you who believe, and those who are given knowledge, in high degrees; and Allah is Aware of what you do.'

Al-Qur'an (58: 11)

This verse describes the importance of the knowledge in uplifting human. Without knowledge, people will be trapped in ignorance, arrogance, and error. Allah said in Surah Az-Zumar verse 9 which means;

*'Say: Are those who know and those who do not know alike?
Only the men of understanding are mindful.'*

Al-Qur'an (39: 9)

Therefore, only the knowledge can lead man to the real success. The love of the scholars and Muslim governments towards the knowledge encourage them to explore various disciplines of knowledge and finally paid off when they reach the golden age of civilization.

Many of the leading Islamic figures in the field of Science and Technology should serve as role models. Among them is Avicenna (*Ibnu Sina*) who is a renowned expert in the field of science and technology and is called the Father of Medicine. His name is well-known in the East and the West and his book translated entitled *Precepts of Medicine* is a basic reference for universities in Italy and France in the 17th century (Mohamad Faizal et al., 2014) and is still referred to and admired in the present. The next figure is Jabir Ibn Hayyan who is the Father of World Chemistry with his achievement to find a way of preparing nitric, hydrochloric, citric, and tartaric acid which is the basic material in chemical experiments to date. He produced several books such as the *Kitab Al-Kimya*, and *Kitab al-Sab'een* which is translated into Latin. Al-Khwarizmi on the other hand was a scholar of Islam who is proficient in mathematics, astronomy and geography. He wrote many works in various fields such as *Al-Jabar wa al-Muqabalah* and *Al-'Amalu bi Asturlab*.

The next Islamic scholar is Ibn Al-Haitham who was an expert in math, science, geometry, medicine, astronomy and philosophy. His work on optics was amazing. He was the first person in the Muslim world to write about optics. The creation of theory of vision by him can be regarded as a revolution in that field (Morrison, 2004). Ibn al-Haytham's phenomenological explanation on the image formation in the eye in the language of mathematics is a radical transformation in the discipline. His book related to optics, *Kitab al-Manazir* explains the psychology of vision and his advanced understanding about refraction can explain why eyes crystalline humor detect some forms of light and color that reaches the eye but not the other. Ibn al-Haytham had a great influence on the field of optics in Europe. In addition, Al-Biruni is also among the figures who had contributed in the field of science and technology. He mastered philosophy, chemistry, medicine, astronomy and geography, and produces almost 180 works in the form of books and leaflets. Among his major works is *Istikhrar Al-Autar Fi Al- Daerah Bi Khowasi Al-Khatti Al-Munhani Al-Waqi' Fiha* which is a masterpiece in the field of trigonometry.

The greatness of past Islamic figures in various fields, especially science and technology can be used as motivation, drivers and challenges to students so that they strive to seek knowledge in various fields to propel again the glory of Islamic civilization in the future. The height of knowledge and their achievements is very impressive and should be emulated. Persistence of Islamic scholars in writing various books in various fields are also exemplary because this is how knowledge can be propagated and handed down to next generation. Teachers should be wise to insert these histories in their teaching so that students are challenged and motivated in their studies.

3.5 Advice and Moral Values

In addition, the infusion of faith in Biology can be done through advice and moral values. This strategy is the easiest attempt that can be done by the teachers in implementing Tauhidic Science elements in education. For example, when teaching about the DNA mutations, teachers can explain how changes despite a single base of DNA can cause disability and even lead to death. Thus, a sense of gratitude to God who created them in the most perfect and healthy can be instilled in the students. In addition, when the teachers teach about pollution, they can incorporate elements of environmental sustainability in the students. Students can be taught to save energy and water and recycle the waste to ensure that the environment is always maintained.

3.6 Using Information and Communication Technology (ICT)

In this era, teachers and students could not escape from the use of ICT. Information can be obtained at your fingertips using smart phones and computers regardless of your location. Therefore, teachers should make full use of these channels to enable students to benefit from it. For example, videos on the human creation can be shown to the students to reinforce biology learning about the reproductive system. In addition, various computer simulations can be shown to students to demonstrate the power of Allah S.W.T to create and thus make them realize how small and limited human knowledge is. For example, the simulation of the size difference between beans, rice, cells, organelles, DNA, and atom (<http://learn.genetics.utah.edu/content/cells/scale/>) can give the realization how complex and precise Allah created man and the universe. In this case, the teachers should wisely use the simulation and explain the Greatness of Allah S.W.T that can be learned from such activities. Without teacher's explanation, videos and simulations will be bland, just like the secular learning of biology.

The rapid development of science and technology coupled with the progress of the Internet that allows the information obtained at your fingertips. The humans admired the power of science to the extent that they unknowingly

made it "god" in a way that they believe that science can solve all human problems. In fact, there are also new scientific discoveries that challenges the faith and test scholars to assess their fatwas in order to be relevant with the current situation (Mohd. Arip bin Kasmu 2000). Therefore, the implementation of science based on the Power of Allah S.W.T and the truth of the Qur'an is necessary to ensure that the students' religious knowledge is in line with the scientific and technological progress. In addition, the Tauhidic Science will hopefully prepare students for the new challenges of science and technology so that it coincides with the fatwa and the religious views. Subsequently Qur'anic generation with Ulul Albab thinking will be born. Ulul Albab is 'those who have a solid Qur'anic foundation, wide and varied knowledge, able to think and observe the creation of God through the heart and sharp mind thus learn from it' (Faszly Rahim et al. 2014).

3.7 Suggestions

Based on the previous studies, a number of suggestions to strengthen Tauhidic science education can be obtained. First, provide a wide range of Tauhidic Science modules. For example, STEM integrated Module STEMind by Faszly Rahim et al. (2014). In addition, Tauhidic Science approach can also be implemented in the science subtopic related to the moral values of such as studies by Shafiah Abdul Rashid et al. (2014) related to the topic of alcohol abuse. Besides, teachers of Islamic and Science Education should collaborate with each other to conduct lesson studies (Zanaton H Iksan, Md Noor Saper & Zetty Nurzuliana Rashed, 2016) so that knowledge can be shared, and Tauhidic Science teaching and learning can be improved. Khalijah Mohd Salleh et al. (2011) based on her study also highlights a number of suggestions, such as holding Tauhidic science seminars and workshops to the teachers. In addition, teaching materials related to Tauhidic Science should be provided to assist teachers in teaching and learning.

Nowadays, the applications of Tauhidic science in education are more focused on the association of the verses of the Qur'an or Hadith with scientific phenomena or issues. It's time for educators to implement these elements in greater detail by linking the Power and Wisdom of Allah S.W.T in each chapter and subtopic taught. For example, in Biology Form 4, the teacher can associate the complex creation of cells such as the function of organelles, plasma membrane and the processes that occur in cells with the Power and Wisdom of Allah S.W.T in creating his creatures and emphasize the uniqueness of the creation may never occur naturally without the existence of the Almighty Creator. This may indirectly foster students' thinking skills of is in accordance with the word of Allah S.W.T in Surah Ali Imran, verse 190-191 which said that the wise are those who think and about the creation of the heavens and the earth and associate it with His Greatness.

Therefore, teachers should improve their knowledge so that each subtopic in Biology can be associated with Might and Power of Allah S.W.T. This way, students will be accustomed to associating all natural and biological phenomena surrounding them with the Power of Allah S.W.T even though they no longer receive the guidance of the teachers. When they further their education and study this phenomenon in greater depth and complexity, their belief in the power of Allah S.W.T will grow. In addition, the leadership of the past Islamic scholars who mastered various fields should be introduced to students so that they can follow their lead in the pursuit of knowledge. This ongoing process will eventually produce students who are always relating what they learned with the Power Allah S.W.T even though they no longer receive direct guidance from the teacher when pursuing higher education. This way, it is hoped that Qur'anic generation with Ulul Albab thinking that will prosper the world in the future will be produced.

4. Conclusion

Tauhidic Science is not a new branch of science, but it is a new approach in defining science by fitrah and Sunnatullah. Through this approach, the faith-centric scientists are able to realize that all the knowledge and findings he obtained is by the grace of Allah in the form of a drop of knowledge from an ocean of His Knowledge. Awareness of the limitations of knowledge will produce a brilliant scientist with humility which carries out research based on the limits established by religion. This could not be instilled in the soul of prospective scientists without knowledge and adequate teachings. Therefore, Tauhidic Science education is important for students to realize the greatness of Allah S.W.T in everyday life as well as long-term effects to produce a generation of science and technology who perform the mandate as the Caliph to bring prosperity to the earth. The glorious history of Muslim leaders in the field of knowledge should be a challenge and encouragement to drive Muslims in studying and mastering the various fields to reach Islamic golden age once again.

However, in reality Tauhidic Science in education nowadays is still in an early stage. There are many more areas that can be explored and examined. Efforts to consolidate it must be multiplied so that all Muslim students in particular may appreciate learning of science guided by the Qur'an in more depth. Science and religious teachers should work together to ensure this goal is achieved. Expertise in both areas of science and religion should be shared so that its benefits can be enjoyed by all students. Therefore, the integration of science and faith element is expected to produce students who are able to think about the Power Allah S.W.T any time in their lives thus creating a deep belief in the existence of Allah S.W.T. This will produce students who are disciplined and work hard in whatever they do and live by the Qur'an in order to achieve success in the world and in the Hereafter.

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