

Science, Technology And Innovation Based Religious: An Analysis

Ang Kean Hua

Abstract: Education plays important role in developing country especially science education. Last few centuries ago, Islamic countries fall behind in science and technology compared to Western countries although in the previous time Islamic country renowned as a nation that produce lots of new scientific discoveries and lots of countries had submitted to Islamic nations during the Golden Age time. Generally, science education can develop a country and economy for a better life. This article will discuss about the problem that Islamic countries faced, which contribute to science education that fall behind among Islamic countries and tried to overcome with solving the problems.

Keyword: Science education, fall behind, Islamic country, scientific discoveries, economy.

1. Introduction

“Science”, can be defined as knowledge that translated from the Latin word, ‘*Scientia*’ (Science Project Official Portal, 2015). According to Cambridge Dictionary Online, science is “knowledge from the careful study of the structure and behavior of the physical world, especially by watching, measuring, and doing experiments and the development of theories to describe the pure or applied science, recent development in science and technology, space travel is one of the marvels or wonders of modern science” (Cambridge Dictionaries Official Portal, 2015). Based on the Webster’s New Collegiate Dictionary, science also can be described as “knowledge attained through study or practice,” or “knowledge covering general truths of the operation of general law, especially as obtained and tested through scientific method and concerned with the physical world” (Science Dictionary Official Portal, 2015). Science has various meaning and various subjects that teach in the schools, colleges, universities, and institutions; which referring to the priority of the societies. In Islamic perspective, science can be defined as the study of nature, where it’s considered to be linked to the concept of Tawhid (the Oneness of God), which connected to all other branches of knowledge (Iqbal, M., 2007). In Islam, they believe that nature is not seen as a separate entity, but as an integral part of Islam’s holistic outlook on God, humanity, and the world. The sentence state that the nature is actually connected with God, where nature is viewed in the Quran as a compilation of signs pointing to the Divine; and pursuit Muslim to apply the science method into nature to get more knowledge (Izutsu, T., 1964). This also bring an understanding and realization where to pursuit the science was tolerated in Islamic civilization, specifically during the eight to sixteenth centuries, prior to the colonization of the Muslim world (Sabra, A.I., 1996). So, again, science is the pursuit of knowledge and understanding of the nature and social world following a systematic methodology based on evidence (what is science-science council.Org). It is a system of acquiring knowledge based on empiricism, experimentation, and methodological naturalism, and human can gain knowledge by doing research. In the history of science, science in the Muslim world refers to the science developed under Islam civilization between the 8th and 16th centuries, where it’s also can be known as Islamic Golden Age (Sabra, A.I., 1996). One example can be proven by the empirical attitude of the Quran and Sunnah which inspired medieval Muslim Scientists, like Alhazen

(965-1037) to develop the scientific method (Qadir, C.A., 1990). From there, Muslim science started to develop into more advance of geography, mathematic, and also in astronomers. For example, Al-Khwarizmi (c. 780-850), who develop algebra to solve the problem of the Islamic inheritance laws (Gandz, S., 1938), and help in the solving the direction of the Qibla, the times of Salah prayers, and the date of the Islamic calendar, through the development of astronomy, geography, spherical geometry, and spherical trigonometry (Gingerich, O., 1986). The develop of Islamic perspective in science still continue until today. In 12th and 13th century, the develop of Islamic medicine is the influenced of the Islamic theologian, where Al-Ghazali are very concern on it and encourage to study the anatomy and use it as a method to gain more knowledge especially through the knowledge of God’s creation (Savage, S., 1995). For example, Al-Bukhari and Muslim’s collection of sahih hadith said, “There is no disease that Allah has created, except that He also has created its treatment.” (Bukhari 7-71:582). Ibn al-Nafis (1213-1288), who also help in the developed of science through Islam, discovered the pulmonary circulation in 1242 and help to discover as evidence for the orthodox Islamic doctrine of bodily resurrection (Fancy, N.A.G., 2006). Follow by Fakhr al-Din al-Razi (1149-1209), who are more love in the physic, develop the concept of physics and physical world in his Matalib, discusses Islamic cosmology, criticizes the Aristotelian notion of the Earth’s centrality within the universe, and explore the notion of the existence of a multiverse in the context of his commentary, based on the Quranic verse “All praise belong to God, Lord of the Worlds.” He is the one that make and help to discover more on the conceptual of physic by critic and question it to the existence. Ali Kuscu’s (1403-1474), who are very support the Earth’s rotation and he reject the Aristotelian cosmology was motivated by religious opposition to Aristotle by orthodox Islamic theologians, such as Al-Ghazali. The development of science in Islam is continue until the modern era. A number of modern scholar like Fielding H. Garrison, Abdus Salam, and Hossein Nars, who are continue develop in scientific method, by using or involve with the modern empirical, experimental, and quantitative approach to scientific inquiry. Meanwhile, Donald Routledge Hill, Ahmad Y Hassan, Abdus Salam, and George Saliba, can be refer as a Muslim scientific revolution, where they are actually introduced a new scientific method from the traditional view and its more supported by most of the scholars. Even until the modern era, there are many

scientist and scholar trying to develop Islamic perspective in Science. However, there are various challenges, problematic issues, and difficulties in trying develop science in Islam. For example, a simple explanation of human cloning, creating a new human from the original human with the same genetic and attitude, where it's actually are one of the most successful research in the modern era, but it's eventually against with the religious perspective. So, is there any important to continue the science into the future? Is there need to have Islamic science to react together? The answer is YES because without science, the country is difficult to increase and upgrading their level of living and only science can reduce the human difficulties in life.

1.2 Advantages of Science Education in Islamic Culture

Education plays the important role in developing country especially in Islamic nation to bring back their Golden Age into their nation. The first verses of the al-quran with the word 'Read' (Noble Quran 96:1) that emphasis the Islam believers the important of acquired and promoted knowledge. The prophet Muhammad (pbuh) also emphasized the important of seeking knowledge in different way:

- a) **Time** : "Seek knowledge from the cradle to the grave"
- b) **Place** : "Seek knowledge even if is far as China"
- c) **Gender** : "Seeking of knowledge is a duty of every Muslim"

Prophet Muhammad (pbuh) not only teaches about importance of knowledge but also emphasized promoting knowledge. For instance, during war of Badr, they caught 70 prisoners. One of the requirements if the prisoners want to be released is by teaching and literate ten Muslim children how to read and write. Science education and culture give lots of benefits and advantages to the Islamic society. Form the Islamic point of view, science education is the study of a nature that can be linked to the concept of *Tawhid* (the Oneness of God) (Iqbal, 2007). The development of science and technology enable the Muslim discovered scientific information that contains in the Qur'an pertaining to creation, astronomy, biology, human reproduction and so on. Muslim also can discover the truth of Qur'an by scientific research. For example Allah said in the holy of Qur'an : " have not those who disbelieve known that the heavens and the earth were one piece, then We parted them and We made every living things of water? (Noble Qur'an 21:30). This verse referring to the Big Bang theory and all living things are made from water since water being a necessary component for life. Lot of research already did by many scientists shows the truth of Qur'anic verse about this statement. Arthur Guyton's in the Textbook of Medical Physiology stated that total amount of water in a man of average weight (70 kilograms) approximately 40 liters, averaging 57 percent of his total body weight. Science education in Islamic society also can contribute to produce more responsible citizens. Students who have learned science will think critically the good and bad of science. Either it can bring benefit or bring harm to the world, environment and society. As *Science for All* American stated that, a good science education helps students "to develop to the understandings and habits of mind they need to become compassionate human beings

able to think for themselves and to face life head on it. It should equip them also to participate thoughtfully with fellow citizens in building and protecting a society that open, decent and vital". For example surrogate mother in Islam perspectives. The purpose of this method is good because help parents to have a child for those who has infertility problems. But in the 80th Muzakarah (conference) of Fatwa Committee National Council of Islamic Religious Affairs Malaysia stated that surrogacy is forbidden in Islam even sperm and ovum were taken from a married couple as this will bring the genetic confusion to the unborn baby. Moreover, science education helps to build a strong economy especially to the Islamic states. Science education provides and produces a generation of individuals who are well prepared for any career and then contribute to the development of Islamic nations. Students who have a better knowledge in science will later be more open to emerging technologies and ideas that can boost businesses and stimulate the economy. As we all know, most of the countries in the world become developed countries because they emphasize and develop the science education for instance US, German, South Korea, Singapore, Japan, Taiwan and so on. In these countries also contribute large amount of money for doing research and patenting then contributing to the economic development. Science education also can contribute to the global health. The Prophet said "There is no disease that Allah has created, except that He also created its treatment." This statement clearly emphasizes the Muslim to find cure for all diseases except death. To find cure for every diseases, someone need to have knowledge in science. Previously, Islamic scholars believe that there are cure for every disease and encouraged them to engage in biomedical research to find the cure. For example Al-Razi also known as father of Islamic medicine contribute lot of discoveries in medical field and we are still using until now because he has wide knowledge in science. Scientific advancement also led to longer, healthier and better lives. Furthermore, with scientific advancement Muslim knows the benefit and miracle of performing prayer 5 times a day. Scientific research show that performing prayers can increase the efficiency of the human heart and blood circulation; and the movement in prayer such as bowing and standing up which are very useful to the vertebral column. Good science education will improve in decision making of an individual. Science education emphasizes and explains the dependency and interrelationship of living things on each other towards environment. Based on this type of knowledge, they will be more respect and taking care of their mother nature from any destruction that can interrupt the relationship among living things. For instance science students tough about food chain during science class, they will know the impact of bring harm to one or more pillars in the food chain. So they will think the best way and making the best decision to enhance the current living conditions for both humans and other living organisms.

2. Problems and Issues

Education has always played a dominating role in forming the destiny of nations and people especially in science and technology. As we all known, Islamic nation during the Golden age emphasized education in science and

technology until they can conquered and develop their country until Spain, Persia, Asia Minor, Syria, Palestine, Egypt, the whole North Africa and so on. All these countries had been submitted to the Islamic state and formed new civilization. Science in Islamic societies already lags far behind the scientific achievements of the west. This problem had raised several questions among Muslim scholars: "What caused the decline of science in the Muslim World?" and "Why Islamic states lag behind in science and technology?" Nowadays, there are some restrictions in science culture and science education in Islamic society, where it's plays an important rule for science to develop. Islamic country usually lack of financial resources and incentives to develop their research and development (R&D) in science except oil-rich states. As we all known, the western countries succeed in development of science because they spend and their government pump in lots of money to do research especially in science. Japan, United States, Germany, and other western countries spend 2 percent or more of their gross domestic product (GDP) on research purpose. Otherwise, no Islamic countries spend more than 0.5 percent of its GDP for the purpose of R&D. Most of the Islamic countries lack in fund to do research and even fund is available, they did not want to spend much for the purpose of R&D. Long term research is needed to develop science and technology and requires lot of financial commitments. The prospects for stable research funding and effective institution building are also poor in Islamic nation. Another problem that Islamic nation faced is issue on brain-drain. Brain drain can be defined as one-way flow of highly skilled and educated people migrate to another country for a better job, salary, or living condition. Docquier and Marfouk (2006) defined brain drain in term of skilled emigrants as a proportion to stock of skilled population living in a country. Normally human capital from Islamic countries moving to Western countries because of weak economic conditions, security issues, internal problems, gender inequality, limited jobs opportunity, lack of manufacturing and agriculture activities, and so on. For example, according to the International Monetary Fund, more than 150,000 of highly educated of Iranian move to another countries in every year in the early 1990s. According to Organisation for Economic Cooperation and Development (OECD) database, around 12 million migrant from Islamic Development Bank (IDB) countries (consist of 56 members) migrants including around 2 million highly skilled migrants, born in member of IDB countries are residents in OECD countries. This showed that large amount of highly educated Muslim stay and working at another country. This issue bring a big lost to Islamic nation for developing science in their countries. Furthermore, Islamic countries lag in development of science education because of ignorant of Muslim Ulema in the rapid development of Science and technology in Western nations and their high standard of living. They consider the poor economic condition among Islamic nations because of God Will. This way of thinking is not true and definitely unislamic way of thinking. Allah said in the holy of al-quran "Verily ! Allah will never change the condition of the people until they change it themselves (with state of Goodness). But when Allah wills a punishment for them, there can be no turning back of it, and they will not find a protector besides Him" (Noble Quran 13:11). Prominent Islamic scholars also

remarked about this issue. Afghani and Syed Sulaiman stated that "Ulema ignorant of modern knowledge cannot serve the Ummah". Maulana Abul Hasan Ali Nadvi (founder Member of Rabita al-alam al-islami) also said "Muslim forgot their own scientific way of thinking and followed only traditional knowledge. They therefore lagged behind in Science and Technology and thus became slaves of the scientifically advanced West". Malaysian 4th Prime Minister, Tun Dr. Mahathir Muhammad also emphasized this issue during Islamic Conference in Kuala Lumpur. He said it is necessary for Muslims to give up their illogical beliefs and regressing thoughts and be prepared to face challenges of the fast changing social order. Moreover, lacking of quality among Universities in Islamic nation also contribute to the lag of science education. According to Pervez Amirali Hoodboy, among 1800 universities in Organisation of the Islamic Countries (OIC) nations, only 312 publish journal articles produced and no OIC universities was included in the top 500 of the "Academic Ranking of World Universities", which was produced by Shanghai Jiu Tong University. The literacy among Muslim society also poor compared to Christian society. Based on the data form United Nation Development Program (UNDP) in 2001, an average only 60 percent literacy in Islamic countries compare to 95 to 100 percent in the west countries. This figures show that Islamic nations lack of quality in providing education to their citizens and lack of education policies that can improve their education.

3. Discussion

Muslim world need to find ways how to solve the problem from lag far behind from Western countries in term of science and technology. In my opinion, Islamic countries need to invest more in their R&D and patenting. As we all know, western countries succeed and very developed because they spend large amount of their money in R&D and patenting. Islamic countries need to focus doing research that can contribute to their own economical purpose rather than buying the technologies from the other countries. Usually, Islamic countries blessed lots of natural resources especially oil and gas. They have lots of natural resources that can be developed by using science and technology. They also have highly talented human capital that migrant to the other countries. If Islamic countries develop their science and become a developed country, the Islamic migrant will come back to their own homeland rather than working at western countries. So the issue on brain-drain among Muslim societies did not happen anymore. Furthermore, Islamic nations need to seat together to discuss the problem that happen among Islamic countries especially to emphasize science education among Muslims. This kind of meeting and conferences need to organize continuously such as Organisation of the Islamic Conferences (OIC), that discuss and share lots of important things among Islamic countries. Islamic nation also need to unite together and avoid war between them in order to bring back Golden Age to their nation. If we read the story, Islamic nation become stronger and lot of countries submitted to Islamic countries because they unite and they have strong leaders that control every Islamic country. In that period, Islamic leaders are intelligent leader that have lots of knowledge especially in Al-Quran and Sunnah. The Islamic nations also can share experiences with Western

countries by doing collaboration with them in order to learn how they develop and success in education in science within their culture. They also can exchange their students with western countries to provide them experience how western countries teach and deliver science education in their schools or universities compared to their homeland. Moreover, Islamic countries need to learn from the history of Golden Age how the previous Islamic scientists very successful in their science education until they well known around the world and their work are still using until now. In my opinion, Islamic student in this period lack of passion in study and doing science compared to Golden Age time where they are very concentrate and tried very hard to solve problems that can easier and contribute to the societies. So, Islamic nations need to find the best ways how to emphasize science education among Islamic society to become a strong and respected country.

4. Conclusion

As a conclusion, Islamic world need to change and find the best way to develop their science education for a sustainable development. They cannot only depend on their natural resources because this type of economic based is not last long. As we all know, natural resources are non renewable resources and will deplete in a certain time. So, Islamic nation need to develop and emphasize their science education in their culture because science is one of important component to develop a strong country in social, environment and economy. Islamic nation need to unite and avoid war between them that can bring loss to the Islamic world. They also need to seat together and discuss how to improve their science to bring back Golden Age to them.

5. References

- [1] Al-Hassan, A. Y., Ahmad, M., & Iskandar, A. Z. (2001). Factors behind the decline of Islamic science after the sixteenth century. *History of science and technology in Islam*. Available via: <http://www.history-science-technology.com/Articles/articles>, 208.
- [2] Cambridge Dictionaries Official Portal (2015). Science Definition from Cambridge Dictionaries Online. Retrieved from <http://dictionary.cambridge.org/dictionary/british/science?q=science>
- [3] Fancy, N. A. (2006). *Pulmonary Transit and Bodily Resurrection: The Interaction of Medicine, Philosophy and Religion in the Works of Ibn al-Nafis (d. 1288)* (Doctoral dissertation, University of Notre Dame).
- [4] Gingerich, O. (1986). Islamic astronomy. *Scientific American*, **254**, 68-75.
- [5] Grandz, S. (1938). *The Algebra of Inheritance : A Rehabilitation of Al-Khuwarizmi*, Saint Catherine Press, 391p.
- [6] Harrison, F. (2007). Huge cost of Iranian brain drain. *BBC News*, 8.
- [7] Iqbal, M. (2007), *Science and Islam*, Greenwood Publishing Group, 233p.
- [8] Izutsu, T. (1964), *God and Man in the Koran: Semantics of the Koranic Weltanschauung*, Keio Institute of Cultural and Linguistics Studies, **5**, 246p.
- [9] Qabir, C.A. (1990). *Philosophy and Science in the Islamic World*, London : Routledge, 218p.
- [10] Sabra, A.I. (December 1996). *Situating Arabic Science: Locality versus Essence*, The University of Chicago Press, **87**, 654-670.
- [11] Sarton, George (1927–48) *Introduction to the History of Science* (3 v. in 5), Carnegie Institution of Washington Publication no. 376. Baltimore: Williams and Wilkins, Co.
- [12] Savage, S. (1995). *Attitude towards dissection in medieval Islam*. Department of Astronomy and Cell Biology, University of California, **1**, 67-110.
- [13] Science Council Official Portal (2015). What is Science? The Science Council. Retrieved from <http://www.sciencecouncil.org/definition>
- [14] Science Dictionary Official Portal (2015). Science Definition from Your Dictionary. Retrieved from <http://www.yourdictionary.com/science>
- [15] Science Project Official Portal (2015). The Definition of Science – What Is Science? Retrieved from <http://www.sciencemadesimple.com/science-definition.html>
- [16] Stann, E. J. (Ed.). (1993). *Science and Technology in the Americas: Perspectives on Pan American Collaboration*. American Association for the Advancement of Science.