ABSTRACT

Science is knowledge related to understanding of the natural world, whereas technology is knowledge related to how knowledge of science is being utilised for overall development. Science of revelation is knowledge revealed by Allah SWT to His Prophets to be conveyed to their followers as a guide to develop the self and human civilisation. Throughout the history of human civilisation, knowledge of science is very crucial for development. There is no development without science, technology, engineering and mathematics (STEM). But revealed knowledge has no role in Western’s perspective. Instead, the presence of revealed knowledge is considered to be interfering with the smooth development of STEM itself. Consequently, today’s development becomes lame because of environmental and global warming issues without viable solutions; issues of over exploitation and manipulation of natural resources so as to adversely affect the world’s economic system; and social issues which are very disgraceful, to the extent that a child does not know how to respect his own parents. This paper unveils the position of STEM in al-Qur’an. This issue needs to be addressed because scientific development without religion is blind, to the point that the goal of development to produce a happy and prosperous human being will not be achieved. While religion without science is equally lame, because religious duties cannot be implemented without appropriate development of STEM.

Keywords: Secular science, Islamic science, acquired knowledge, revealed knowledge, sustainable development.

1. INTRODUCTION

STEM is frequently concomitant with development of nature by man. No one may deny that man needs STEM to develop and prosper in this world. Without STEM, the world would not be as developed as we see it today. Only mankind, and no other creatures, has the potential to develop STEM, because mankind has the capacity to understand nature in a limited way. Mankind’s ability to systematically, logically and objectively understand nature, and then
develop STEM and nature themselves, enables them to properly administer and manage nature.

Science is not knowledge which can explain everything, especially subjective knowledge such as the concept of happiness. Science is also unable to explain the aspects of emotional and spiritual satisfaction. Unfortunately, the over-adulation for science has caused it to dominate every aspect of human life – all knowledge including social sciences and literature are required to be explained scientifically for it to be universally accepted. Likewise, with knowledge related to psychology and humanities, religious and cultural are required to be justified scientifically to gain universal acceptance.

This reality is causing society to neglect religious teachings, culture, tradition and ethics (subjective knowledge) in their daily life, which ultimately produces people who are ‘scientific mind’ – making science as their ideology (which may be called as scientism), such as to bring forth humans who are blind to religion, and unclear about life’s objectives, thus undermining the family institution and lack of etiquette in social manners. All these are the consequences of science being developed without religion, without the pristine values of human dignity (Lewis, 2006; Vitz, 2009).

The consequence is that a system is born which separates between affairs related to understanding nature, that is science; and a system which enables man to understand God, that is, religious knowledge as well as knowledge which enables man to properly understand his social responsibilities. Some alternative suggestions have been submitted by Gardner (1984) who discusses the Concept of Multiple Intelligence, Goleman (1996) the Concept of Emotional Intelligence, and Zohar (2000) the Concept of Spiritual Intelligence. But the concept of human intelligence which they propose is still out of the scope of revealed knowledge as taught in Islam.

This paper attempts to unveil the important of STEM which is mentioned in al-Qur’an. This paper also attempts to see STEM in the wider scope of revealed knowledge in order to create a desire to propose a new approach in teaching STEM in our education system – a science education which is based on divinity, friendliness to the environment, humans and society.
2. WHAT IS SCIENCE?

There is no singly specific definition of science which may be given to explain its meaning. Based on several definitions given by Medawar (1984), Adler (1976), Crump (2002), DBP (1992) and Shaharir Mohamad Zain (2000), one can conclude that the term ‘science’ means, ‘knowledge of information based on observation of natural phenomena, generated systematically, rationally and objectively by using a devised method based on certain premises by the observer until reliable knowledge is aggregated’

The root word of ‘science’ comes from the Latin word ‘scientia’ means knowledge, the degree of knowing of a person about the natural phenomena. To Medawar (1984), the truth of science is the truth based on the goals desired to be achieved through work done by a scientist through what is called asymptote; a truth which is not conclusive or absolute, which may still be disputed and criticised, but is assumed to be so. Science only gives the possible direction of the scientific study, but it does not have the ultimate goal desired. Thus, the exploration of knowledge on natural phenomena studied always varies and is not absolute.

Although the above definition of science may be improved and argued, generally it can be said that pure science is knowledge pivoted on how man is able to observe natural phenomena which behaves according to its fitrah (natural disposition). The result of systematic observation is then rationally and objectively argued and analysed, experimented and compared to its theoretical assumptions. This knowledge continues to be cultivated and developed to increase the treasure of science knowledge itself.

In order to develop knowledge of science, scientists are required to make basic assumptions or premises for the development of their knowledge. According to Toby E. Huff (1995), the philosophy of pure science requires three basic assumptions:

**First**, scientists believe that nature is organized or in a regular and certain order. This means that nature is coherent, organised according to certain rules or laws, and in a foreseeable or predictable domain.

**Second**, scientists believe that man is able to give reasons rationally for the observed natural phenomena; they have the mental capacity to understand nature by conducting an investigation through rational argument. Nevertheless, scientists also believe that a certain theory about natural phenomena may be wrong at some point. At the same time, they also
believe that they probably may not know everything about the nature that they observe. But they are certain that ultimately, man will be able to give reasons through a systematic, logical and objective investigation. Therefore, they believe a scientific investigation must be conducted continuously in order to refine their understanding of the nature.

Third, scientists are also believing that everyone (including people who has different backgrounds and cultures), has the liberty to use his power of intelligence to question and reason with logic for a certain observed phenomenon. He is also free to question the veracity of the science the scientists claim. Scientists also believe that after scientific investigation, everyone will finally reach the same conclusion from observation phenomena. With these assumptions, they consider science as universal knowledge, unlike the arts of culture and tradition which are localised.

Based on the definition and premises of science, we can conclude that epistemology of STEM education can be summarised as in Figure 1. In the Western’s perspective, STEM is the knowledge based on how man is able to observe natural phenomena with his intellectual intelligence. After understanding the nature, he strives to obtain the techniques to utilise the observed nature. The knowledge of understanding the techniques to utilise nature are known as technology.

![Figure 1: Epistemology of STEM according to Western scholar.](image-url)

3. WHAT IS AL-QURAN?

Al-Quran is a book revealed as right guidance or enlightenment (*huda*) to all human being to guide them throughout their life. Its contents clearly state the difference between the rights
and the false as asserted by Allah SWT in al-Baqarah (2): 185. We can summarise al-Qur’an as follows,

Al-Qur’an is the Word (Kalam) of Allah SWT, a miracle (mukjizat) revealed to the Prophet Muhammad (pbuh), written (mashaf), and narrated by narrators clearly without doubt. Thus, recitation of al-Qur’an, even without understanding it, is an act of ibadah (Subhi Salleh, 1978). This definition by Soenarjo et. Al. (1412 H) in the famous Al-Qur’an dan Terjemahannya (al-Qur'an and its Translation) is used as reference in Malaysia and the Malay world today.

Al-Qur’an is also an original, genuine and authentic book. It has never been challenged, irrefutable and undisputed by anyone since it was sent and bound during the time of Caliph Saidina ‘Uthman till today. The binding was led by Zaid bin Thabit, together with Abdullah bin Zubair, Sa’id bin ‘Ash and Abdurrahman bin Harith bin Hisyam (Ishfaq Ahmad, 2000).

Al-Qur’an is a book which has produced numerous religious (Islamic) individuals and societies. Islam encompasses the ritual and social aspects. It has produced cultured and civilized societies, whose lives are organized, orderly and systematic. In order to ensure the Muslim communities, continue to develop, they are required to make al-Qur’an as the source of inspiration to build the future.

Al-Qur’an is a book which needs to be fully believed as the revelations of Allah SWT. A true Muslim must sincerely and earnestly believe in it. Disputing Al-Qur’an may revoke one’s declaration of faith (syahadah), even though there are statements in it which rationally and logically do not make sense to one’s or a group’s thinking, such as the story of Prophet Ibrahim (pbuh) who was thrown into the fire by King Nimrod but the fire did not burn him; or the story of Prophet Isa (pbuh) who could bring the dead to life and so on. Al-Qur’an is the main basis of belief for the development of the Muslim aqidah (system of believe).

4. SCIENCE FROM ISLAMIC PERSPECTIVE

What is the position of science as described in al-Qur’an? Muslim scholars have never rejected the scientific approach such as being practiced by Western scholars. In fact, Muslim scientists were the first to establish the scientific method that we have today (Watt 1979). Muslims are very much encouraged to observe nature as mention in Surah Ali ‘Imran (3): 190-191,
'Behold! In the creations of the heavens and the earth, and the alternation of night and day, - there are indeed Signs for men of understanding, - Men who celebrate the praises of Allah, standing, sitting, and lying down on their sides, and contemplate the (wonders of) creation in the heavens and the earth, (With the thought): Our Lord! Not for naught hast Thou created (all) this! Glory to Thee! Give us salvation from the penalty of the Fire!'

Likewise, surah Faathir (35): 27-28 in which means:
‘Sees thou not that Allah sends down rain from the sky? With it We then bring out produce of various colours. And in the mountains, are tracts white and red, of various shades of colour, and black intense in hue.’
‘And so, amongst men and crawling creatures and cattle, are they of various colours. Those who truly fear Allah, among His servants, who have knowledge: for Allah is Exalted in Might, Oft-Forgiving.’

In surah Al-Mulk (67): 3, Allah SWT says as in the following meaning,
‘...No want of proportion wilt thou see in the creation of (Allah) Most Gracious…’

Further, in surah Al-Qamar (54): 49, Allah SWT also says in the following meaning,
‘Verily, all things have We created in proportion and measure (with predestination)’

The verses above clearly tell the Muslims to observe, and study the occurrences and phenomena of the creations, the earth and the heavens. They are told to use their intellect, to give reasons and causes on the phenomena of nature’s creation which is balanced and follow the rules or measures prescribed by Allah SWT. Study of the celestial phenomena is included in the field of astronomy. In surah Faathir (35): 27 & 28, Allah SWT tells Muslims to observe and reflect on the formation of rain which comes down from the sky, then nourishes a variety of plants to grow. Likewise, with the mountains, structure of rocks and minerals are useful for man. Other than nature, Allah SWT also urges Muslims to study the different types of behaviour of humans, variety of wild and domestic animals, from which Muslims may draw lessons and take benefit.

In the above verse, Allah SWT refers to people who observe nature with the sentence, “Men who celebrate the praises of Allah, standing, sitting, and lying down on their sides, and contemplate the (wonders of) creation in the heavens and the earth, (With the thought): Our Lord! Not for naught hast Thou created (all) this! Glory to Thee! Give us salvation from the
penalty of the Fire!" It means that in Islam, knowledge related to understanding of nature (STEM), is very important and crucial to study. But STEM must not make us forget our responsibilities to the Creator of nature, because we are appointed by Him to be His caliph (al-Baqarah (2); 30). In other words, Islam enjoins Muslims to master STEM, but not at the cost of neglecting our responsibilities to Allah SWT. As caliph, STEM helps Muslim to be a good manager and administrator in order to govern this nature.

Those who remember Allah SWT, wherever and whenever they are, at the same time they understand nature as created by Allah SWT, are given by Him the title, ulul al-bab or possessors of wisdom. In surah Fathiir (35) above, Allah SWT names those who understand nature as al-Ulama (or scholars). Al-Ulama also are the people who understand nature as discussed earlier. In other words, they are scientists who understand the properties of nature, and social scientists who understand the nature of human being; at the same time they are most closest (taqwa) to Allah SWT, fear his sanction and punishment, do not transgress limitations, who are bold but humble in spite of their understanding of nature and human behaviour because they know that Allah SWT Knows More and is the Most Powerful, and they also promptly seek forgiveness from Him if they have acted in an unrestrained manner in attempting to understand nature.

As a conclusion, the epistemology of STEM in Islamic perspective can be shown as in Figure 2 below:
Figure 2: Epistemology of Islamic STEM which depicts relation man with Allah SWT, man with man, and man with the nature around him in developing science and technology.

The main difference between STEM from the Western perspective and STEM from Islamic perspective is that the former rejects any form of religious argument, even though their scientists understand that their knowledge is limited, not absolute and secular, whereas Islamic STEM places great importance on divinity that the spirit and ultimate goal in working is purely for Allah SWT. All innovations, creativity and inventions by Muslim scientists are manifestations of self-responsibility to their God. Thus, creativity which is destructive, uncivilized and environmentally and socially damaging to well-being is totally forbidden.

5. CONCLUSION

The world is in great need of STEM’s development. It will generate economic development and, hopefully prosperity to the country. Unfortunately, the development of STEM which neglects culture and religion values blind the people as to which direction development will take. The well-being and wealth obtained are just mirage or shadow of the sculpture in the middle of the barren desert, not real well-being which brings peace of mind to the heart and soul. Consequently, we see before us how a highly STEM literate society is unable to handle issues of global warming, speculation and currency manipulation, and social moral decay of religion and culture. In fact, white collar crime in front of us is destroying the world economic system of today (Fukuyama, 2008). The lesson teaches us how harmful is a system developed based on scientific achievement but neglects responsibility to God. That is why we will be blinded if we develop science and technology without religion.

Conversely, religious development needs STEM’s development. There is no point of man being the caliph of Allah SWT entrusted with governing and administering this world if man fails to understand it properly. How would man properly govern and administer the nature if he is ignorant about it. Is it possible to cover our privacy (aurat) as demanded by religion if we do not know how to make appropriate clothing? Is it possible to fulfil our responsibility of putting into practice the tenets of Islam if we do not master STEM? That is the reason religion will be lame without STEM.

Wallahuaklam (Allah knows the Truth).
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