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SCIENCE AND TECHNOLOGY IN THE QURAN EDUCATION METHOD

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Abstract

Technological advances in the last three decades have shown its influence on any and all lives of individuals, society and country. It can be said that no one can escape from the influence of the development of science and technology, science and technology is not only felt by the individual, but also by the community, nation and state. Modern science and technology makes many people admire then imitate in a lifestyle without being selected in advance of any negative impacts in the future or the resulting multidimensional crisis. Islam does not hinder. The progress of science and technology is also not anti-technological goods in the past, present or future come. In the Qur'an there are many texts (verses) which encourage people to see, look, think, and observe the phenomena of the universe created by Allah SWT. interesting for investigated, researched and developed. The Qur'an challenges humans to use his mind as optimally as possible.

Keywords: Science, Teknologi, Alquran

INTRODUCTION

Knowledge begins with a strong human curiosity. This turbulent curiosity has a tremendous power to push people to find an answer. In addition to curiosity, various problems faced by humans are also the reason why humans carry out long thinking processes to find solutions. By thinking, contemplating, observing, studying, analyzing, and concluding an object of study consistently and systematically, humans can gain knowledge. Humans are always filled with curiosity, and for that humans will always think and think to find the answer. The answers to curiosity can be called knowledge. This knowledge will become a science when it meets the criteria of scientific, rational, systematic, consistent, and obtained through the procedures of the scientific method[1][2][3].

Along with the progress of human thinking today, science is developing very fast. The development of this science has entered almost all areas of modern society. There is hardly a single society in this era that is completely untouched by the success of scientists[4][5]. With the advancement of information technology, for example, today farmers in the interior

or fishermen on the coast are too foreign to the lifestyle of urban people. They can even follow various events in different parts of the world through electronic media. However, from the various advantages or benefits felt by the community from the advancement of science, technology, and industry, it still leaves a negative impact on all aspects of life[6][7][8].

On the other hand, science, technology and industry have indeed helped the way humans work and accelerated the transformation of information globally, so that the world is becoming increasingly narrow. However, on the other hand, the development of science and technology directly or indirectly, it also threatens human survival. The most obvious impact of modern science and technology is on the environment and the preservation of nature, including on human life itself. Nuclear and modern weapons are products of science and technology that can bring progress to human life and also threaten the survival of humans and the natural surroundings[7]. Science also has a close relationship with social and political structures which in turn causes millions of people to fall into poverty, hunger, and

various inequalities which have become a striking sight in the midst of people deifying the power of science and technology to eliminate human suffering[8][9].

Islam as a religion that is thick with ethical and human values – in accordance with its assertion – is a religion that spreads mercy to the universe, it is time to struggle with the basic principles of the philosophy of science and the workings of science. That is, Islam-the Qur'an and Al-Hadith-functions as a basis and guide in the process of philosophy, workings, and the application of science. This is intended so that science and technology in its application are always efficient and effective in accordance with the goals and functions of science for human welfare [10][11][12][13].

In addition, in history it has been mentioned that Muslim scientists at that time had become pioneers for the advancement of Islamic civilization in all fields of science about eight centuries before the time of Galileo Galilei Copernicus (1473-1543)[12]. This at least shows that the basic principles of science have been compiled by scientists long before the philosophy of science was formulated as a scientific discipline. Islamic civilization has achieved success and spectacular progress in the field of science (sciences) in the early period of its history. This progress was achieved at a time when Europe was still in the dark ages. This small paper attempts to comprehensively study and trace the concepts of science and technology in the perspective of the Qur'an[13][14][15].

RESEARCH METHODS

In the Qur'an there are verses that provide motivation so that humans use the mind to read and observe natural phenomena universe. The Qur'anic texts related to science and technology are, Al-Qur'an as a product of Allah's science and technology, Al-Quran as a predictor, Al-

Quran as a source of motivation. Al-Quran and its simplifications (simplifications), Al-Quran is a source of ethics for the development of science and technology.

إِنَّ فِي خَلْقِ السَّمَوَاتِ وَالْأَرْضِ وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ لَآيَاتٍ لِّأُولِي الْأَلْبَابِ ﴿١٩٠﴾ الَّذِينَ يَذْكُرُونَ
اللَّهَ قِيَامًا وَقُعُودًا وَعَلَىٰ جُنُوبِهِمْ وَيَتَفَكَّرُونَ فِي خَلْقِ السَّمَوَاتِ وَالْأَرْضِ رَبَّنَا مَا خَلَقْتَ هَذَا
بَطْلاً سُبْحَانَكَ قِنَا عَذَابَ النَّارِ ﴿١٩١﴾ رَبَّنَا إِنَّكَ مَن تُدْخِلِ النَّارَ فَقَدْ أَخْرَجْتَهُ ۗ وَمَا لِلظَّالِمِينَ مِن
أَنْصَارٍ ﴿١٩٢﴾

2 Verily in the creation of the heavens and the earth, and the alternation of the night and the day there are signs for people of understanding (namely) those who remember Allah while standing or sitting or lying down and they think about the creation of the heavens and the earth (said: "Our Lord, You did not create this in vain, Glory be to You, So save us from the torment of Hell. O our Lord, verily, whoever You put into Hell, You have truly humiliated him, and there is not for the wrongdoers a helper.

Figure 1. Surah Ali Imran 190-192

In the view of the Qur'an-as implied by several verses above-that science is classified into two kinds, namely ladunny science and kasyby science. Ladunny science is knowledge obtained by humans without any human effort. As indicated in the letter Al-Kahf verse 65, Al-Baqara verse 31 and so on. What is classified as this science is knowledge related to unseen things, such as hell, heaven, angels, barzakh realms, spirits and so on. While the science of kasyby is knowledge that is obtained by humans by using the potential of the mind (thinking) and the heart (feeling). This kasyby science is obtained by humans by carrying out thought processes after using their five senses about the reality around them (physics). These sciences include physics, mathematics, social, politics, linguistics and so on. According to Liang Gie and Andrian the11, Kasyby's knowledge is divided into 6 large clumps as follows:

1. Exact Science (Mathematical Sciences)
2. Material Science (Physical Sciences)
3. Life Sciences
4. Psychological Sciences
5. Social Sciences
6. Linguistic Sciences

أَفَلَا يَنْظُرُونَ إِلَى الْإِبِلِ كَيْفَ خُلِقَتْ ﴿١٧﴾ وَإِلَى السَّمَاءِ كَيْفَ رُفِعَتْ ﴿١٨﴾ وَإِلَى الْجِبَالِ كَيْفَ نُصِبَتْ ﴿١٩﴾ وَإِلَى الْأَرْضِ كَيْفَ سُطِحَتْ ﴿٢٠﴾

Then do they not see the camel how he was created (17) And the heavens, how he was exalted? (18) And how are the mountains set up? (19) And how was the earth spread out? (20)" (Al-Ghaasyiyah: 17-20)

Figure 2. Surrah Al-Ghaasyiyah: 17-20

This division is caused because in the view of the Qur'an there are things that can be sensed and things that exist but cannot be sensed by humans. For example in Surah an-Nahl verse 8 Allah says:

وَالْحَيْلِ وَالْبِغَالِ وَالْحَمِيرَ لِتَرْكَبُوهَا وَزِينَةً وَيَخْلُقُ مَا لَا تَعْلَمُونَ ﴿٨﴾

And (He has created) horses, mules and donkeys, so that you may ride them and (make them) adornments. and Allah created what you did not know." (An-Nahl:8)

Figure 3. Surrah An-Nahl:8

Based on the verses above, broadly speaking, the objects of science can be grouped into two main parts, namely the material and non-material realms. The latest science makes the object of scientific study in the material realm that can be sensed, seen, tasted, heard, smelled, so they limit science to that field. Even some of them do not know the existence of an unprovable reality in the material world. Therefore, according to them, the object of science only includes natural science and its application. Therefore, according to them, a science must be systematic, scientific, logical, and can be proven empirically. The object of science according to the Qur'an includes both material and non-material realms. As indicated in the verses above. From the explanation of the verses mentioned above, it can be drawn a key word to explore the concept of science in the Qur'an, namely ulul albab. It is interpreted as a combination of thinking-ratio (al-'aql) and remembrance-rasa (al-dzawq: intuition). On the other hand, the Qur'an not only instructs humans to use their minds to grasp the secrets contained in the universe, but also teaches how to maximize and function together the potential bestowed upon them, namely sight, hearing, and sense of intuition.

RESULTS AND DISCUSSION

The evidence of science in the Qur'an is very much, among them, Nebula, Perfection in the Universe, Orbit, Travel of the Sun, Seven Layers of Heaven.

فَإِذَا انشَقَّتِ السَّمَاءُ فَكَانَتْ وَرْدَةً كَالدِّهَانِ ﴿٣٧﴾ فَيَا أَيُّهَا الْآءِ رَبِّكُمْ كُنْتُمْ بَنَانِ ﴿٣٨﴾

So when the sky has been split and turned rose red like (shiny) oil. So which of the favors of your Lord would you deny?" (Ar-Rahman: 37-38)

Figure 4. Ar-Rahman: 37-38

A nebula is a collection of 100 billion galaxies shaped like a rose.

الَّذِي خَلَقَ سَبْعَ سَمَوَاتٍ طِبَاقًا مَا تَرَى فِيهَا خَلْقَ الرَّحْمَنِ مِنْ تَفَوُّتٍ فَارْجِعِ الْبَصَرَ هَلْ تَرَى مِنْ فُطُورٍ ﴿٣٩﴾ ثُمَّ ارْجِعِ الْبَصَرَ كَرَّتَيْنِ يَنْقَلِبْ إِلَيْكَ الْبَصَرُ حَابِئًا وَهُوَ خَبِيرٌ ﴿٤٠﴾

Who has created the seven heavens in layers. you never see in the creation of the Most Gracious God anything that is not balanced. So look over and over again, do you see anything that is out of balance? Then look again and your eyesight will return to you without finding anything flawed and your eyesight will be in poor condition." (Surat al-Mulk: 3-4)

Figure 5. Surat al-Mulk: 3-4

In the universe, countless billions of stars and galaxies move in separate orbits. Nonetheless, everything is in sync. Stars, planets and moons revolve around their respective axes and in different systems.

وَهُوَ الَّذِي خَلَقَ اللَّيْلَ وَالنَّهَارَ وَالشَّمْسَ وَالْقَمَرَ كُلٌّ فِي فَلَكٍ يَسْبَحُونَ ﴿٣٣﴾

The stars, planets, and moons revolve around their axes and in their systems, and the larger universe operates in an orderly fashion. They all move in their own orbits (QS. Al-Anbiya': 33)

Figure 6. QS. Al-Anbiya: 33

The stars, planets, and moons revolve around their axes and in their systems, and the larger universe operates in an orderly fashion. They all move in their own orbits.

اللَّهُ الَّذِي خَلَقَ سَبْعَ سَمَوَاتٍ وَبَيْنَ الْأَرْضِ بَيْنَهُنَّ سَبْعُ آسْمَانٍ يَتَوَكَّلُ الْمُتَوَكِّلِينَ ﴿١٢﴾ إِنَّ اللَّهَ عَلَى كُلِّ شَيْءٍ قَدِيرٌ ﴿١٣﴾ وَإِنَّ اللَّهَ فَذٌ شَاطِرٌ عَلَى كُلِّ شَيْءٍ عَلِيمٌ ﴿١٤﴾

It is Allah Who created the seven heavens and likewise the earth. Allah's commandment applies to him, so that you may know that Allah is All-Powerful over all things, and verily Allah has full knowledge of all things. (Surat al-Tholaaq: 12)

Figure 7. (QS. Al-Tholaaq: 12)

Earth's atmosphere is made up of seven layers. According to Encyclopedia Americana (9/188), the following layers are superimposed, depending on temperature, namely the troposphere,

stratosphere, mesosphere, thermosphere, ionosphere, exosphere, and magnetosphere.

Among the commentators there are those who argue that *la yabghiyan* means that each of them does not want it. Thus, the meaning of verses 19-20 is that there are two seas, both of which are separated because they are limited by an isthmus, but the isthmus is not wanted (Not needed) So in the end, the isthmus is thrown away (dug for traffic purposes), then the two meet that ocean. such as the Suez Canal and the Panama Canal.

⁶ In the verse above it is emphasized that two types of water meet, but do not mix with each other due to a boundary. ¹ How can this happen? Usually, when water from two seas meet, it is assumed that the water will mix with each other with temperature and salt concentration tending to be balanced. However, the reality that happened was different from what was expected. For example, although the Mediterranean Sea and Atlantic Ocean, and the Red Sea and Indian Ocean physically meet each other, their waters do not mix with each other. This is because between the two there is a boundary. The Strait of Gibraltar is even more visible. Between the water in the Strait of Gibraltar and the Mediterranean Sea, there is a clear color difference between the two.

In the Big Indonesian Dictionary, technology is defined as technical ability based on scientific knowledge based on technical processes. Technology is the science of how to apply science to use nature for human welfare and comfort. If so, sophisticated machines or tools are used. That is not what is meant by technology, although in general people often associate sophisticated tools with technology. Machines have been used by humans since the last century, but this century has not been called the era of technology.

Tracing the views of the Qur'an on technology, invites us to look at the many verses of the Qur'an that explain the universe. According to the scholars there are about 750 verses of the Qur'an that talk about the universe and its phenomena, and command humans to know and make use of it. Strictly and repeatedly, the Qur'an states that the universe was created and subjugated by Allah for the benefit of mankind.

The existence of the potential and availability of land created by God, as well as the inability of the universe to disobey His commands, all of which lead humans to have the potential to take advantage of what God has subjugated. The success of utilizing nature is the fruit of technology. The Qur'an praises a group of people who he named *Ulul Albab*. Their characteristics, among others, are described by Q.S. Al-Imran [3]: 190-195, which has been mentioned above. In this verse, two main characteristics of *insane ulil albab* are described, namely humans who are always in meditation and always in *dhikr*. Through these two consistent processes, humans can produce "Natijah" products which are very useful for humans in carrying out their duties as *Abdullah* and as *kholifah* of Allah. *Natijah* in question is not just ideas that are arranged in the mind and concepts, but also goes beyond it to the stage of implementation or practice and its application or utilization in everyday life (technology).

Muhammad Quthub and his book "Manhaj Attarbiyah Al-Islamiyah" commented on the Al-Imran verse above as follows: These verses perfectly describe the Islamic method of reasoning and observation of nature. These verses direct the human mind to its first function among its many functions, namely studying the verses of God that are presented in this universe. These verses begin with contemplation and end with charity. Knowledge of this last thing leads scientists to the secrets of nature, and in turn leads to the creation of

technology that produces convenience and benefits for humans.

Here we turn to technology and the results it has provided. If only we made a tool or machine as a concrete picture of technology. Machines are getting more sophisticated day by day. These machines with the help of humans combine with each other. So that it is more complex, it can no longer be controlled by one person, but it can do the work that many people do. In this stage, the machine has become a kind of "enemies" of humans, or animals that must be manipulated so that they will follow the human will.

Today, technology is born, especially in the field of genetic engineering, which can lead to making tools as aids, even creating future tools that will be enslaved and subject to tools. But if the results of technology from the beginning are thought to be able to divert humans from 10 origin of the purpose of creation, then from an early age Islam rejected the presence of technological products. Because it becomes a problem for the dignity and existence of humanity. Then how to combine the mechanical ability of humans to create technology, with the maintenance of natural values. How to direct technology so that it can go hand in hand with Rabbany's values, or in other words how to combine thinking, dhikr, knowledge, and faith. In the view of the Qur'an, it is clear that all the potentials possessed by humans such as the mind to think, the heart to dhikr, feelings (intuitive), the physical to do charity must be combined in a strong unity and subject to absolute guidance (Al-Qur'an) as a guide for humans in living life in this world. This is all so that humans can achieve safety, happiness, and prosperity in this world and in the hereafter while remaining dignified and different from animals.

Science and technology is a field that is arranged systemically according to certain methods that can be used to explain all

aspects that occur. The benefits of science and technology are countless because technology will often develop according to human needs. From here, automatically because the knowledge he develops has many benefits, a person who has knowledge will have many advantages over others. In this section the author will describe the virtues of people who have knowledge and responsibilities seen from the perspective of the Qur'an, as follows:

يٰۤاَيُّهَا الَّذِيْنَ اٰمَنُوْا اِذَا قِيْلَ لَكُمْ تَفَسَّحُوْا فِى الْمَجْلِسِ فَقٰفَسَحُوْا يَفْسَحِ اللّٰهُ لَكُمْ وَاِذَا قِيْلَ اَقْمُوْا فَاَقْمُوْا يَرْفَعِ اللّٰهُ الَّذِيْنَ اٰمَنُوْا مِنْكُمْ وَالَّذِيْنَ اٰوْتُوْا الْعِلْمَ دَرَجٰتٍ وَاللّٰهُ بِمَا تَعْمَلُوْنَ خَبِيْرٌۭ

Who believe, when you are said to you: "Be spacious in the assembly", then be spacious, Allah will make room for you. and when it is said: "Stand up", then stand up, Allah will raise those who believe among you and those who are given knowledge by several degrees. And Allah is Knowing of what you do." (Surat al-Mujadilah: 11)

Figure 7. (QS. Al-Mujadilah : 11)

In the perspective of the Qur'an as a person who is given the mandate of science (scientist), he has a responsibility to Allah SWT and His creatures. Among the responsibilities of a scientist according to the Qur'an are as follows:

Underlying knowledge and its application on the basis of faith (al-Mujadilah: 11)

A scientist in studying a science, he is guided that the science to be studied is the knowledge of Allah (Kauniyah or Qouliyah). Therefore, he began his study by mentioning the name of his Lord, and the process of acquiring knowledge followed Divine signs, the purpose of his study was -lillahi- to fulfill his duties as Abdullah and as the caliph of Allah.

Have a fear of Allah SWT (Fatir: 28). What is meant by scholars in this verse are people who know the greatness and power of Allah. In the context of this verse, Ulama are those who have clear knowledge of natural phenomena. Rasulullah SAW also emphasized that: There are two kinds of knowledge, knowledge in the chest, that is knowledge that is beneficial to humans. And

knowledge that is only on the tip of the tongue, then that will be a witness against humans. They are afraid to use the knowledge they have to do disobedience to Him, because all knowledge and its application in addition to providing benefits for humans, also have consequences (consequences) in this world and the hereafter. Those who hold the title of a scholar are those who know the verses of Allah, both kauniyah and qouliyah and the power of Allah, apply their knowledge according to the nature and divine signs, continuously and consistently to achieve the pleasure of Allah SWT. A scientist is forbidden to hide his knowledge (al-Baqarah: 159). A scientist is ordered to make good, improve, preserve nature and is forbidden to do damage to all sectors of life and the environment on earth. A scientist should have insight into the benefits of two dimensions (world-hereafter) (al-.,Alaq: 1-5). Fear Allah SWT (al-Baqarah: 282). Implementing the knowledge they already know. With knowledge, humans can gain the ability to maintain and develop life and life in order to achieve life goals. So it seems clear that knowledge is something that is necessary for human life. Intellect and science and technology in the Qur'an have a high position, because reason and the command to seek knowledge are not only theoretical teachings, but these teachings must really be practiced and implemented.

CONCLUSION

Humans have an instinct to always thirst for knowledge. There are two human desires that will never be satisfied, namely the desire to seek knowledge and the desire to demand wealth, throne, and life adornments. This can be a trigger for humans to continue to develop science and technology by carrying out the process of thinking and dhikr and taking advantage of God's grace bestowed on humans. Therefore, we are not able to stem the pace of science and technology that continues to progress and update. We are only able to

direct and control humans as producers, distributions, and consumers of science and technology so as not to put science and technology under the control of their passions, but to put them both following Divine instructions and human nature.

If humans in producing and applying science and technology follow their passions, of course the science and technology they produce will not only benefit humans, but will also become a powerful boomerang to destroy and destroy themselves. And vice versa, when humans produce and apply science and technology in exploiting the universe for the benefit of humans as servants and as caliphs and based on divine guidance, then it is certain that he will become a very useful human figure on this earth. Why should humans follow Divine instructions in producing and applying science and technology? That's because the knowledge and capacity of the human brain to accommodate the knowledge of Allah, as well as all human abilities are very limited.

Science in the perspective of the Qur'an is classified into two, namely knowledge whose objects are material and non-material. How to get it by using the mind to think, study, observe, the heart to believe and dhikr, dzauq to feel (intuitive), and physical means to apply knowledge.

The purpose of science and technology in the perspective of the Qur'an is to achieve prosperity, safety, and happiness in this world and the hereafter. And to be used in carrying out human duties as Abdullah and kholifatullah based on the Qur'an and Al-Hadith. As well as avoiding the use of inappropriate science and technology that causes damage in various aspects of life.

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