

## SCIENCE AND TECHNOLOGY IN THE QUR'AN ( STUDY OF ISLAMIC EDUCATIONAL PHILOSOPHY)

<sup>1</sup>Shynta Sri Wahyuni Ginting

[Shintasriwhyuni04@gmail.com](mailto:Shintasriwhyuni04@gmail.com)

<sup>2</sup>Ahmad Syukri

[Ahmadsyukri080278@gmail.com](mailto:Ahmadsyukri080278@gmail.com)

<sup>3</sup>Salminawati

[Salminawati@uinsu.ac.id](mailto:Salminawati@uinsu.ac.id)

### Abstract

This observation aims to carry out studies on aspects related to science and technology based on the perspective of the Koran, including positive and negative impacts on life. Researchers used a qualitative descriptive approach using library research (library research). Researchers carried out data collection techniques with information analysis techniques using inductive and deductive analysis and documentation. The study results obtained data if science and technology are based on the point of view of the pure Qur'an because they are still needed in human activities; therefore, they must be upheld and provide a lot of relief for living things. However, in practice, it should be considered more carefully. This is also related to the positive and negative impacts that arise, so appropriate wisdom is needed so as not to cause harm to others in living life.

**Keywords:** Science, Technology, Al-Quran

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<sup>1</sup> Universitas Islam Negeri Sumatera Utara, Indonesia

<sup>2</sup> Universitas Islam Negeri Sumatera Utara, Indonesia

<sup>3</sup> Universitas Islam Negeri Sumatera Utara, Indonesia

## A. INTRODUCTION

Science and technological sophistication, which cannot be separated from one another, are two things that have a connection. The existence of knowledge can provide a point of view on the source of technological progress and sophistication that can classify many findings related to engineering and ideas and share inspiration with each other. Actual results that are up-to-date and able to encourage humans to be productively derived from applied knowledge are the notion of technology. The Qur'an has studied and analyzed a lot of information and explanations connected to knowledge and technology based on the philosophical analysis in the Qur'an. As explained in the kalam of Allah found in Q.S. al-Anbiya, 21: 80

وَعَلَّمْنَاهُ صَنْعَةَ لَبُؤْسٍ لَّكُمْ لِنُحْصِيَنَّكُمْ مِنْ بَأْسِكُمْ فَهَلْ أَنْتُمْ شَاكِرُونَ

*“We teach the prophet Daud the rules for shaping armour to you to fortify you from the invasion of your adversaries (on the battlefield). Therefore, can you thank (God)?”.*

The development of technology requires mastery of science to be able to teach humans about all activities carried out. As noted in the explanation above. Man must be able to understand that knowledge is impermanent. This is intended if there are errors in the past then they can be corrected in the present. A truth that comes from within human life is alternately the intention of scientific insight whose truth is relative. However, in this case, there is a difference in what has been conveyed in the Qur'an, which is essentially the truth of the Qur'an is absolute.<sup>4</sup>

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<sup>4</sup> Andi Rosadisastira, *Metode Tafsir Ayat-Ayat Sains Dan Sosial* (Jakarta: Amzah, 2007), 105.

There are several verses in the Qur'an that explain things that study science and technology (scientific truth). The facts that occur in the Qur'an and Hadith. The material of reflection that has been passed by human reason can be derived from the laws of nature and events that have occurred in nature. The Qur'an is a miracle passed down to the prophet Muhammad and can be used as a handle to live life.

In the book *Compendium of the Set of Verses of the Qur'an* written by Mochtar Naim, there is a connection with life which explains that more than 350 verses contained in the Qur'an describe events that exist in the universe. He also explained that the verses are related to the problem being researched.<sup>5</sup> Quraish Shihab said that the Qur'anic verse examines scientific authenticity, intending to show things related to the Oneness of Allah. Studies strengthen faith and belief in God and focus more on humans in making observations. In contrast, Mahmud Salut's book of interpretations explains that Allah does not demean the Qur'an at all to be used as a guideline that only describes people's exposure. Not only explaining problems related to knowledge problems, but the Qur'an also provides instructions and is used as a guide for humans in living life towards the afterlife.<sup>6</sup>

In addition to academic activities, science can often be seen by scientists, politicians, entrepreneurs, and ordinary people who use the words knowledge and technology. This, if observed in terms of

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<sup>5</sup> Mochtar Naim, *Kompendium Himpunan Ayat-Ayat Al-Qur''an Yang Berkaitan Dengan Masalah Biologi Dan Kedokteran* (Jakarta: Gema Insani Press, 1996), 152.

<sup>6</sup> Quraish Shihab, *Membumikan Al-Quran Fungsi Dan Peran Wahyu Dalam Kehidupan Masyarakat*, XXXI (Bandung: Mizan, 2007), 58.

profession. There have been many acronyms or abbreviations regarding science and technology because of the large number of words used.<sup>7</sup>

Science is the result of human reason, either in the form of experiences derived from humans themselves or those that have been systematically conceptualized. The statement is based on the ideas put forward by Andi Hakim Nasution. Andi also explained that if science can be developed, it can produce a product that humans can use.<sup>8</sup>

The whole form contained in science, which includes "social sciences" and "natural sciences", explains sciences. A particular group includes many problems that occur in human life, which include economic, legal, social, psychological, linguistic, artistic, and religious aspects. This is what can be understood about social sciences. The problems that exist in human life, including physics, chemistry, biology, mathematics, meteorology, astronomy, and geology, are what can be understood for the meaning of sciences is also a particular group that often occurs. Everything that can raise the position of human beings is called technology. In addition, technology is also used in the application of science.<sup>9</sup>

The word technology originated from the Greek study of "technology", which comes from the term "technology" and has a meaning as an art discourse. Manuel Castells, quoted from Capra, explained that technology is a collection of equipment, provisions and

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<sup>7</sup> Anna Poedjiadi, *Sains Teknologi Masyarakat Model Pembelajaran Kontekstual Bermuatan Nilai* (Bandung: Remaja Rosdakarya, 2005), 1.

<sup>8</sup> Gazali Ismail, *Al-Quran Perspektifnya Terhadap Sains Dan Teknologi Ethos Kerja Generasi Muda Dan Profil Ulama Zaman Modern* (Padang: Angkasa Raya, 1990), 10.

<sup>9</sup> Wildan Yatim, *Biologi Modern Pengantar Biologi* (Bandung: Tarsito, 2006), 3.

procedures that are part of the scientific application in activities or work that can be used as a method.<sup>10</sup>

A science that makes it easier to pursue and understand things included in science is called science. While the fruit or results obtained from activities that occur in science are the meaning of technology.

Since 638 AD, scientific development has begun, starting from Iskandariah (Alexandria), where he is an expert in the health field. Draper explained that the activities in Islamic society could influence the improvement of science that had begun in Iskandariah from its conquest in 638 AD. They were able to understand the Greek writings and were able to provide explanations with the correct method two centuries.<sup>11</sup> Science has undergone developments in mathematics, chemistry, astronomy, physics, pharmacy, and medical sciences. In the growth of chemistry science, which includes: Jabir Ibn Hayyan, al- Kindi, and al- Razi. Famous mathematicians, including al- Khawarizmi and Umar Khayyam, have been able to make considerable contributions.<sup>12</sup>

European society was still in the dark ages, surrounded by Khurafat myths and dogmas before the advances in science developed by Arab societies. A person named "Dozi" who has carried out a western scholarly education named in his presentation in the book "The History of Muslims in Spain" that if it were not for Arab societies, then Europe would not have experienced a revival and would continue to regress

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<sup>10</sup> M.Thoyyibi, *Filsafat Ilmu Dan Perkembanganya* (Surakarta: Muhammadiyah University Press, 1994), 102.

<sup>11</sup> Ika Rochdjatun Sastrahidayat, *Ilmu Pengetahuan Modern Dan Agama Islam* (Surabaya: Avicenna, 2015), 26–27.

<sup>12</sup> Anna Poedjiadi, *Sains Teknologi Masyarakat Model Pembelajaran Kontekstual Bermuatan Nilai*, 28.

throughout the centuries.<sup>13</sup> Permission can only be given to some to be involved in the development process of technology that has undergone growth and development. The growth and development of the many branches of science that have occurred during the 19th century to the present that has become one of the drivers in the growth and development of technology.

The presence of technology that has a relationship with science already exists in the historical record can reinforce its emergence. The relationship between science to technology is no longer undeniable.<sup>14</sup> The development of technology and the acceleration in technological progress have become discussions that continue to be discussed. Apart from humans who continue to compete in adapting to technology, nations are also competing with each other, and this is one of the reasons. Idealism is already a good representative because the growth of technology provides a lot of convenience to the crowd.

Providing convenience to every activity carried out by the community is the goal of developing technology and science. Humans can communicate and interact only through technological advances, even over long distances. The availability of communication can provide convenience to the community in interacting anywhere and anytime without knowing the boundaries.<sup>15</sup>

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<sup>13</sup> Ika Rochdjatun Sastrahidayat, *Ilmu Pengetahuan Modern Dan Agama Islam*, 28.

<sup>14</sup> Rohadi Abdul Fatah dan Sudarso, *Ilmu Dan Teknologi Dalam Islam* (Jakarta: Rineka Cipta, 1992), 98.

<sup>15</sup> Anna Poedjiadi, *Sains Teknologi Masyarakat Model Pembelajaran Kontekstual Bermuatan Nilai*, 59.

It is understood that the impact caused by technology also impacts the environment. The impact that occurs can be positive, can also be harmful, and it can be intentional or unintentional based on the initial intention that has been done to obtain many results.<sup>16</sup> This impact can happen, but to be able to feel it takes a long time.

## **B. METHOD**

Qualitative research is a method that researchers use with library research. Studies that focus on analysis or interpretation activities derived from written sources are literature review research.<sup>17</sup>

To get the correct credibility value, the author refers to verses from the Qur'an that connect with science and technology to be the origin of primary data. Secondary or additional data sources come from other information, either criticism or a description of someone in a novel or published writing. Moleong explained that information sources have various definitions, such as written sources that can be exemplified by theses, books, dissertations, and supporting documents or in the form of curriculum vitae that can be used as statistical data in additional sources of information.<sup>18</sup>

The author uses the documentary method during the data collection process along with the information. The author collects documents related to the data needed for reinforcement in the research. The author uses two inductive methods as a way of showing information analysis. The point is to explain the Qur'an verses related to knowledge

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<sup>16</sup> Ahmad Y. Al-Hasan dan Donald R. Hill, *Teknologi Dalam Sejarah Islam* (Bandung: Mizan, 2000), 20–21.

<sup>17</sup> Mudjia Raharjo, *Metodologi Penelitian* (Malang: UIN Maliki, 2015), 56.

<sup>18</sup> Lexy J. Moleong, *Metodologi Penelitian Kualitatif* (Bandung: Remaja Rosdakarya, 2002), 113–16.

and technology. After that, the author gives conclusions associated with the picture of science and technology from the point of view of the Qur'an. In addition, the inductive method is also used the deductive method. It is a method that is carried out by finding sources based on the Qur'an regarding science and technology, then proven by searching for verses from the Qur'an related to science and technology

### C. RESULTS AND DISCUSSION

#### a. The Process of Developing Science and Technology in Islam

Every human being has faith in God and has the virtues outlined in the following verse (QS. Az-Zumar (39) : 9)

أَمَّنْ هُوَ قَانِتٌ آنَاءَ اللَّيْلِ سَاجِدًا وَقَائِمًا يَحْذَرُ الْأَجْزَةَ وَيَرْجُوا رَحْمَةَ رَبِّهِ قُلْ هَلْ يَسْتَوِي الَّذِينَ يَعْلَمُونَ  
وَالَّذِينَ لَا يَعْلَمُونَ إِنَّمَا يَتَذَكَّرُ أُولُوا الْأَلْبَابِ

*"Are you the more successful class of shirkers) or the human beings who perform worship in the evening through prostration and standing, caused by fear of (doom) the afterlife and pleading for mercy from God? Then say, "Is there anything in common in those who know with those who don't?" Indeed, only people with common sense are capable of learning a lesson".*

Other virtues are also found in (QS. Al-Mujadilah (58) : 11)

يَا أَيُّهَا الَّذِينَ آمَنُوا إِذَا قِيلَ لَكُمْ تَفَسَّحُوا فِي الْمَجَالِسِ فَافْسَحُوا يَفْسَحِ اللَّهُ لَكُمْ وَإِذَا قِيلَ انشُرُوا فَانْشُرُوا  
يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ

*"O people of faith! if it is said to you: "Divide the ease of each assembly", so make it easy, undoubtedly God will send you ease. And if say: "Stand ye", so stand up, then God will raise (the position of) those who have faith among you and those who are given knowledge to some degree. Indeed, Allah is Most Conscientious what you do".*

If Allah wants to exalt the degree of a people, then the people must be able to carry out the mandate of Allah, the Messenger, and the



people who know, as explained in the verse above. In this verse, it is also recommended that humans be able to carry out activities in the aspect of developing science by visiting and attending a collection of scientific assemblies. Also included in this verse explains if there is a strong motivation so that humans can be more enthusiastic in learning to be able to contribute.

However, during its development, motivation always experiences ups and downs. There is a phase where people will feel that they need more enthusiasm in carrying out activities in acquiring knowledge to make them far from the science itself. There is also a phase in which humans will be actively involved in efforts to help improve science. As in the middle ages 1) The development of science and technology in Islamic civilization began in the 9th century to the 15th century among Muslims, namely leaders who have intellectuals in the science and technology section. It is fitting that Muslims should be proud of this glorious achievement. However, if studied further, this cultural excitement can be regarded as a good thing can also be judged as a bad thing, depending on the concept of thinking of each individual.<sup>19</sup>

Suppose the argument is carried out only for the sake of utilizing the abilities that exist in the future only so that the proof of the self or can also drown oneself in the reality that occurs in the problems that Muslims feel today, to the point of causing the uselessness obtained in the growth of the Islamic population in contemporary times. However, suppose the argument is carried out to provide knowledge among the Islamic community to progress and develop to obtain this period of

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<sup>19</sup> Osman Bakar, *Tauhid Dan Sains Esai-Esai Tentang Sejarah Dan Filsafat Sains Islam* (Surabaya: Pustaka Hidayah, 2018), 67.

excitement through positive steps. In that case, it can give progress to the people themselves.

In the European region, science experienced reasonably significant growth in the 7th to 15th centuries. It started during Harun al-Rasyid, from Baghdad, to become the highlight of a triumphant world. There is also an activity of translating writings from Persian, Syriac, Greek, Sanskrit, and Indian scholars into Arabic.<sup>20</sup> Arabs are easier to understand and more accessible to learn science and can develop it with the translation activity. Growth and development at that time in science already included physical, pharmaceutical, medical, chemical, and astronomical sciences. Chemical scientists such as Jabir Ibn Hayyan, al-Kindi, as well as al-Razi, had a significant contribution to its development.<sup>21</sup> Muslim scientists to the sustainability of the growth and development of science give a considerable investment. Researchers residing in the European region also acknowledged the statement.<sup>22</sup>

Suppose you explored the condition of the Muslim community when it was in the past when Muslims asked their people to gain knowledge and be able to develop it. In that case, it can be concluded that the Qur'an is not contrary to scientific insight. The decline of science and technology in the time of Islamic civilization during its heyday is a positive factor that makes it easier for people to improve and advance science and technology to enhance innovative and original scientific ideas. If this factor has been widely known, it causes its application in

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<sup>20</sup> Anna Poedjiadi, *Sains Teknologi Masyarakat Model Pembelajaran Kontekstual Bermuatan Nilai*, 37.

<sup>21</sup> Ika Rochdjatun Sastrahidayat, *Ilmu Pengetahuan Modern Dan Agama Islam*, 28.

<sup>22</sup> Ika Rochdjatun Sastrahidayat, 29.

life so that it can be known as a trigger factor for the decline and stagnation of Islamic science and technology.

Based on a statement presented by Dr Ahmad Amin, who said that Muslims had experienced setbacks from science and technology. In the last century, not only the growth and progress of science and technology came from the Muslims could be proud of. But this incident should have received support from the Islamic community. Currently, Islam has increasingly experienced growth in the Eastern region to the Western part, especially since it has entered the centre of the development of science, such as in America, Japan, and Europe.<sup>23</sup>

It can be known as things that can affect the decline of Islamic science and technology today by understanding what has been described above as stated by Abdus Salam quoted from Muhammad Ansorudin Sidik, which includes: a) Science experts who are successors of the previous ones still do not prepare a new generation to be able to control scientific analysis which is an aspect of life. b) The next successor who is quick to experience satisfaction with what was obtained from previous scientists so as not to cause innovations. c) Lack of support from leaders residing in Islamic regions so that science and technology do not experience growth and development. This is what makes an example of the growth of science and technology in Islamic civilization.

### **b. Qur'anic Perspectives on Science and Technology**

The verses of the Qur'an become a handle for people who have faith in Allah. In the verses of the Qur'an, Muslims are also invited to carry out activities that continue to improve science and technology. In

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<sup>23</sup> Dikutip dari buku yang ditulis oleh Muhammad Ansorudin Sidik, *Pengembangan Wawasan Iptek Pondok Pesantren* (Jakarta: Bumi Aksara, 1995), 16.

verses of the Qur'an, it is widely recommended to study science and technology. Some phrases help give Muslims awareness about the urgency of science. The first verse handed down provides the order with of Muslims to read, namely Q.S.Al-Alaq:1-5, which deals with the importance of studying science.

Many hadiths of Prophet Muhammad SAW advice Muslims to acquire knowledge. There is a phrase that states that whoever is part of a group of believers then takes knowledge wherever he is.

The cues contained in the Qur'an are the normative reality recommended for acquiring and improving knowledge. The Qur'an promises Muslims who unite religious values and the value of general knowledge will get a high degree. The actual existence between the well-proficient and the non-proficient is also a gesture. One can get to the creator of the universe through the intercession of science. With science, it will better understand what God commands. This is as found in the Prophet's prayer contained in Q.S. Thaha:114:

فَتَعَلَّى اللَّهُ الْمَلِكُ الْحَقَّ وَلَا تَعْجَلْ بِالْقُرْآنِ مِنْ قَبْلِ أَنْ يُقْضَىٰ إِلَيْكَ وَحْيُهُ وَقُلْ رَبِّ زِدْنِي عِلْمًا

*"Then the Highest God, the real King. Then you (Muhammad) are not in a hurry in (reading) the Qur'an if the revelation given to you has not ended) then say, "O my Lord, give me knowledge."*

A person reluctant to read will then feel distant from his creator. As a caliph on earth, man can carry out the mandate that has been given by utilizing the knowledge possessed, as explained in Q.S. al-Baqarah: 31:<sup>24</sup>

وَعَلَّمَ آدَمَ الْأَسْمَاءَ كُلَّهَا ثُمَّ عَرَضَهُمْ عَلَى الْمَلَائِكَةِ فَقَالَ أَنْبِئُونِي بِأَسْمَاءِ هَؤُلَاءِ إِنْ كُنْتُمْ صَادِقِينَ

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<sup>24</sup> Al-Burhan Zarkasyi, *Fi Ulum Al-Quran*, 1st ed. (Al-Halabiy: 72, 1957), 71.

*"And he taught the prophet Adam asthmatics (objects) entirely, and he showed them to the angels, saying, "Specify against me the name of all (things) if you are the right one!"*

Science, an interpretation of AL-Isma, has the advantage of making humans worthy of occupying even higher positions. As contained in Q.S.al-Mulk 67: 3-4, which is considered appropriate and perfect. Therefore, natural objects are subject to logical, rational, and invariable laws of occurrence. In modern science, the legal foundations are the laws of genesis or Sunnatullah. Maurice Bucaille also said in his book "The Quran, Bible and the Modern Science" that there is no contradiction between the Qur'an and modern science. The Qur'an becomes a guide in human life.<sup>25</sup>

The importance of science and technology is found in the following verses of the Qur'an: 1) Qabil, who learned how to bury corpses and learned how to dig holes from crows (Q.S Al- Maidah: 30-31); 2) The prophet Noah who made the ship (QS. Hud: 36- 44); 3) It was Prophet Ibrahim who built the foundation of Baitullah who was also assisted by Ismail (QS. Al- Baqarah: 124- 132); 4) Prophet Yusuf who managed natural resources derived from produce (QS. Joseph: 55- 56); 5) The prophet David who made armour and made use of hills and mountains (QS. Al- Anbiya: 81- 82, Q. S An- Naml: 15- 28, QS. Saba': 12- 13, Shad: 34- 40).<sup>26</sup>

The Qur'an has emphasized that science and technology are fundamental to help humans carry out Allah's mandate as a leader in the

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<sup>25</sup> Muchtar Naim, *Kompendium Himpunan Ayat-Ayat AlQuran Yang Berkaitan Dengan Fisika Dan Geografi (Ilmu Alam Dan Ilmu Bumi)* (Jakarta: Hasanah, 2001), 151.

<sup>26</sup> Muchtar Naim, 34.

world. God has given man an advantage with expertise in acquiring knowledge in science and technology. As contained in Q.S. al-Baqarah (2): 31. God affirmed that the prophet Adam had been given the ability of "Asmaa-a Kullaha", where "Asma" is more accurately interpreted as an "attribute" or disposition. Meanwhile, "asmmaa- ul husna" means a good temperament from Allah (Q.S. 59: 24). Therefore, the word "asmmaa- ul husna" is more accurately interpreted as science, which is a science that explores nature and laws that are obeyed in the heart. The Qur'an's hint about the interweaving between the ability of science and the duty as a caliph on earth is evident based on the explanation in the above verses. Angels are not given the obligation of being leaders in nature but are left to people who are considered to have the potential to improve science on the scale that has been bestowed upon them.<sup>27</sup>

### **c. Consequences Of Science and Technology In Human Activities**

In reality, the impact caused by the application of science and technology has been felt in previous and present lives. Science cannot be kept from its application; if it seems reasonable or unsuitable, knowledge is not neutral. This raises a bit of a problem: "who is capable of influencing science on the value system?" In the study conducted by Shaharir, there are indications that the value system in science can influence the linked group of scientific experts, half of whom do not conform to the Islamic religion. In order not to be mired in values that are not by the teachings of Islam, the value that accompanies modern knowledge must be accurately described.<sup>28</sup>

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<sup>27</sup> Ramli Abdul Wahid, *Ulumul Quran* (Jakarta: Grafimdo, 1996), 89.

<sup>28</sup> Shaharir bin Mohamad Zain, *Islam Dan Pembangunan Sains Dan Teknologi Makalah, Disampaikan Dalam Konggres "Menjelang Abad 21: Islam Dan Wawasan 2020 "* (Kuala Lumpur, 1990), 20.

In explanations related to humans and the universe, there is a tremendous influence on findings derived from science and technological developments. Then it could have caused confrontation through spiritual and traditional thinking about the man or the universe and all its elements. People's views and thoughts on religion certainly have different benefits. Some see religion as the central aspect of the attachment and cohesiveness of its people. Religion is considered an aspect that has integrity in society. Some view religion as an aspect of social turnover, or it can be said that religion significantly influences social change. Some thoughts consider that religion can play a role in social activities.<sup>29</sup>

The result of the development of science on society on the values accompanying it cannot be known. Ziauddin Sardar interpreted imperialists and epistemology to be a threat to future generations. In his presentation, it is stated that "The epistemology of Western civilization today has become a more dominant point of view of thinking by leaving aside other methods of knowledge."<sup>30</sup>

The epistemology of civilization that includes robust Western science and technology has allowed no one to be able to shy away from it. The capacity of ability in every people must be returned to the Qur'an while pursuing and understanding the meaning of every event in the universe.

Technology requires people's readiness to use the products produced for public consumption. If the Western world experiences

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<sup>29</sup> Muhammad Tolhah Hasan, *Prospek Islam Dalam Menghadapi Tantangan Zaman* (Jakarta: Lantabora Press, 2003), 285.

<sup>30</sup> Ziauddin Sardar, *Masa Depan Islam* (Bandung: Pustaka Salman, 1987), 86.

setbacks caused by the technology it created, other countries will also be affected. Technology is not the cause of the mistake, and it will still be an improper human being to respond to this.<sup>31</sup>

Everything God has created must be able to be believed if all have a purpose in God. Guided by the teaching of Oneness, in which God owns the world and all of it, everything that comes from Him will also go to God. The steps taken should be aimed at getting blessings from God. The Qur'an only wants observation of the universe if made for knowledge, as in the West. Science is the path to achieving man's ultimate goal.

#### **D. CONCLUSION**

The Qur'an strictly commands man to continue improving his thinking to innovate the nature that Allah has provided as his object. This is so that it can produce good science and technology for human welfare as a provision for worship to God. Science is the way to achieve man's ultimate goal of the hereafter.

Science and technology, a product of culture, cannot be separated from their subjectivity. Science and technology, in other words, have no freedom in quantitative terms, let alone loaded with value. Therefore, the development of science and technology must be able to display positive and negative effects, depending on humans in responding to it.

God has given man the trust to become a priest on earth. Then humans should be able to develop science and technology as much as possible. But man must also understand so as not to be enslaved by

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<sup>31</sup> Philip Kristanto, *Ekologi Industri* (Yogyakarta: Andi Offset, 2002), 32.



existing developments. If Muslims are still unable to keep up with the alternative epistemology of Western countries, then the Qur'an's integrity must all be restored.

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