

AL-QUR'AN AND THE NEED FOR ISLAMIC EDUCATION TO ARTIFICIAL INTELLIGENCE

Made Saihu

Institut PTIQ Jakarta, Indonesia, madesaihu@ptiq.ac.id

Abstrak

Meyongsong era pendidikan 4.0, dibutuhkan langkah konkret seperti menyiapkan siswa dengan kemampuan berpikir kritis, mampu mengembangkan komunikasi interpersonal dengan baik, kreatif, dan tentu saja kolaboratif; menstransformasi model pendidikan agar lebih adaptif dengan perkembangan teknologi dengan melakukan; menyesuaikan kurikulum untuk membekali siswa mengenai big data, kecerdasan buatan, dan masyarakat digital secara umum; menyediakan konten pembelajaran digital. Visualisasi pendidikan yang mampu memikat dengan menginspirasi adalah melalui kecerdasan buatan. Selain itu kecerdasan buatan sebenarnya bukanlah sesuatu yang baru dalam dunia Islam. Jauh sebelum mengenal peradaban modern, digambarkan dalam Al-Qur'an bahwa basic kecerdasan buatan pernah dilakukan oleh Samiri sebagaimana disebutkan dalam QS. Thaha; 77-78. Tulisan ini tidak bermaksud untuk membenarkan apa yang dilakukan oleh Samiri, tetapi mengambil pelajaran dari apa yang dilakukannya bahwa akal dapat menciptakan sesuatu melampaui batas zamannya. Kecerdasan buatan tidak saja menciptakan berbagai kemudahan dan peluang dalam pendidikan, tetapi juga tantangan. Guru wajib memastikan tercapainya tujuan pendidikan Islam itu sendiri, karena peran guru tidak bisa digantikan sepenuhnya oleh teknologi. Keterbutuhan pendidikan Islam terhadap teknologi sangat membantu dari aspek praktis dan administrasi terutama terkait dengan efisiensi dan efektivitas, tetapi proses penanaman nilai tidak dapat menggantikan peran dari seorang guru.

Kata Kunci: Al-Qur'an, Pendidikan, Kecerdasan Buatan


Abstract

Welcoming the era of Education 4.0, concrete steps are needed such as preparing students with critical thinking skills, able to develop good interpersonal communication, be creative, and of course collaborative; transforming educational models to be more adaptive to technological developments by doing; adapting the curriculum to equip students with big data, artificial intelligence, and digital society in general; provide digital learning content. Visualization of education that is able to captivate and inspire is through artificial intelligence. In addition, artificial intelligence is actually not something new in the Islamic world. Long before the introduction of modern civilization, it is described in the Qur'an that the basic artificial intelligence has been carried out by Samiri as mentioned in the QS. Thaha; 77-78. This paper does not intend to justify what has been done by Samiri, but to take lessons from what he did that reason can create something beyond the limits of its time. Artificial intelligence not only creates various facilities and opportunities in education, but also challenges. Teachers are obliged to ensure the achievement of the goals of Islamic education itself, because the role of

teachers cannot be completely replaced by technology. The need for Islamic education to technology is very helpful from practical and administrative aspects, especially related to efficiency and effectiveness, but the process of instilling values cannot replace the role of a teacher.

Keywords: *Al-Qur'an, Education, Artificial Intelligence*

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A. INTRODUCTION

Inevitably, today the life of the world community is faced with challenges in the era of disruption. According to the Indonesian Dictionary, disruption is something that is uprooted from its roots. If interpreted in colloquial language, it can mean fundamental or fundamental change. This era of disruption is a phenomenon when society shifts activities that were originally carried out in the real world, to the virtual world. Disruption is an innovation that will replace the entire old system with new ways. Disruption replaces old, all-physical technology with digital technology that produces something completely new and more efficient, also more useful.¹ Disruption affects various sectors of life, including education. The development of science and technology is growing, and science will be interrelated.

Specifically, in the 21st century, the world is facing the phase of the Industrial Revolution 4.0, which is also often referred to as the cyber physical system. This revolution focuses on automation and collaboration with cyber technology, which will affect all sectors of human life. The use of humans, will be replaced a lot with the use of technological machines. The role of technology in the era of the industrial revolution 4.0 took over almost most of the economic activity. And it will change many areas of human life, including the world of work and even the lifestyle of man himself. Reporting from the Forbes.com site, the Industrial Revolution makes all things more effective, easy to reach, and minimize waste.

In the Industrial Revolution 4.0, there are at least five technologies that are the main pillars in developing a digital-ready industry, namely: Internet of Things, Big Data, Artificial Intelligence, Cloud Computing and Additive Manufacturing. The Internet of things refers to the conditions in which the objects around us can communicate with each other through an internet network, while Artificial Intelligence is a man-made "intelligence" that is immersed at least in computational operations and robotics. With the Internet of Things, Big Data Analytics, and AI

1 Rhenald Kasali, *Disruption* (Jakarta: Gramedia, 2017).

will greatly help human life. Nevertheless, a combination or one of the three can also be a very troubling thing. Elon Musk, today's world-renowned billionaire, owner of Tesla and Space X, in 2017 said in front of the Governors of the United States that "I know about the latest intelligence technology, and I think we have to worry about this." On the other hand, the late prominent physicist Stephen Hawking even assessed the development of Artificial Intelligent can be the end of human life.

Artificial Intelligence (AI) or artificial intelligence is the driving force of the industrial revolution 4.0 which promises many conveniences for various sectors, ranging from the government and industrial sectors. The term Artificial Intelligence or AI, comes from a conference called *the Dartmouth Conferences* in 1955, and the person who inspired it was John McCarthy (1927-2011). He interprets artificial intelligence or AI so easily: "Artificial intelligence is the Science and Engineering to make intelligent/smart machines."

Whereas According to Kaplan & Haenlein, kecerdasan buatan is "the ability of the system in external data interpreted, for study from data, as well as use in learning it is for get purpose & specific task through adaptation flexibly".² Meanwhile, Mc Carthy defines Artificial Intelligence as the manufacture of smart machines, especially intelligent computer programs using science and technology.³ This is related to attempts to understand human intelligence, but artificial intelligence does not need to prove itself as a biologically observable method. Artificial Intelligence, then, will inevitably affect the education sector. The Education Revolution 4.0 developed along with the development of the Industrial Revolution 4.0. Therefore, the transformation of change-sensitive education must also be by realizing that technology is not the ultimate goal. The educational process is not only in the form of technology provision, but also by preparing every educational actor starting from students, teachers, leaders of educational institutions, parents, government and the industrial world.

On the one hand, technological advances, especially Artificial Intelligence, provide optimism for expediency and convenience in various areas of life. But on the other hand, technological advances have an impact on the moral and ethical aspects of human beings. Addiction to social media and sex robots that are starting to become a trend is also a concern in itself. And the most important problem in the development of Artificial Intelligence is the ethical problem of the development of artificial intelligence technology is the ethical problem, whether AI will be able to replace the role of humans, as creatures created by Allah SWT who have reason.

According to the analysis, Artificial Intelligence will encourage the occurrence of mass unemployment in the world. Research firm Gartner predicts that

² A.M. Kaplan & Michael Haenlein., *Users of the Worlds, Unite! The Challenges and Opportunities of Social Media* (France: Kelley School of Business, 2009).

³ John Mc Carthy, "What Is Artificial Intelligence?", *Computer Science Department* (Stanford: Stanford University, n.d.).

AI will create 2.3 million jobs and eliminate 1.8 million jobs (with a growth of 500,000 jobs) by 2020. This suggests that AI will make many layoffs happen around the world. A 2013 study frequently referenced by Oxford University showed that some of the jobs most likely to be lost were the ones that were important (albeit less skilled) that kept the financial industry moving, including *bank tellers*, insurance *underwriters*, and tax officers.

In the field of education, disruption comes from students consisting of millennials (and neo-millennials or generation Z) whose learning behaviors are completely different from the previous generation. This change in behavior demands a radical change in our educational approach. Millennial protégés are a highly-mobile, apps-dependent, and always connected generation online (always connected). They so quickly receive and share information through social networks. They are self-learners who are always looking for the knowledge they need themselves through social media. They refuse to be patronized. They are a very visually-literate generation, therefore prefer to learn visually (through videos on YouTube, online games, even using augmented reality) rather than through text (reading books) or hearing teacher lectures in class. They are also very data-literate so they are good at surfing on Google to explore, process, curate, and analyze information instead of passively wallowing in libraries. It is done super-fast through 3M: multi-media, multi-platform, and multi-tasking. And they are more comfortable learning collaboratively within a real project or peer-to-peer approach through communities or social networks (using social learning platforms). For them peers are more credible than teachers. And remember, they prefer to use interactive gaming (gamification) to learn, rather than playing homework in writing. Educational technology has also developed exponentially, potentially disrupting traditional schools.

With a variety of innovations perhaps classrooms are less needed. Teachers will drastically change roles as mentors, motivators, and models. And what is clear is that there will be so many learning channels and schools will no longer be able to monopolize the learning process. As a learning vehicle, traditional schools will be shifted from the position of "core" to "peripheral". The learning process is not only in the classroom but can be done anytime, anywhere, any platform/device. Technology 4.0 produces new skill-sets while disrupting old competencies that are no longer relevant because they are replaced by robots and AI. Not only repetitive jobs, analytical jobs from various professions such as doctors, lawyers, financial analysts, tax consultants, journalists, accountants, to translators.

So, the world of education, especially Islamic education must be able to quickly improve itself to immediately welcome the many conveniences and benefits provided by Artificial Intelligence technology. At the same time, prepare yourself to anticipate the negative impacts that will occur, especially related to aspects of

ethics and humanism. Appropriate preparation, strategy and anticipation steps are needed in anticipating the era of artificial intelligence in its implementation in the world of education.

B. METHOD

The research method used in this paper is a qualitative method with a literature study approach. The technicality of data collection carried out is to record data taken from various sources from written materials and then identify contextual evidence, namely by looking for the relationship between the data and reality that the author examined. Data processing in this study is qualitative, so it is carried out by critical analysis, comparison, and interpretation of various search results from primary and secondary sources. Thus, the data approach of this study is qualitative in substance and the correlation of the network of variables is also qualitative.

For this reason, in the processing of data analysis, the author made a selection of the collected data then after being selected the researcher began to code according to the discussion and topic. In addition to referring to various reading sources related to research, in the discussion of this material the author refers to several books of interpretation related to the material using the thematic interpretation method. Thematic interpretation or also better known as *maudu'i tafsir* is a pattern of interpretation by focusing on one topic related to a particular problem, then defining the keywords of the problem, then collecting verses of the Qur'an related to the topic both *lafadz* and law, then looking at the interpretations of these verses in accordance with the purpose of the Qur'ani.⁴ This thematic interpretation is carried out to make it easier to interpret verses of a contemporary nature.

C. RESULT AND DISCUSSION

The use of Artificial Intelligence technology in the era of the Industrial Revolution 4.0, will affect all aspects of life, including educational aspects. The sophistication of technology is like a double-edged sword, on the one hand it provides many benefits but on the other hand it also provides challenges that must be anticipated. In order to be able to survive and compete in the face of technological developments, humans must adapt. But as a Muslim, you still have to stick to instructions that are in accordance with the teachings of Islam, which are sourced from the Qur'an and Hadith

The offer of convenience provided by Artificial Intelligence technology, encourages humans to compete to use it in various areas of life, and the field of education is no exception. Along with its rapid development, the use of Artificial Intelligence technology stimulates the emergence of further questions about the future. Will technology be able to replace the function of humans as creatures created by Allah Swt? And another concern is related to ethics, human values, and aspects of spiritualism. Or how does the concept of Islamic education and the

⁴ Akhmad Alim, *Tafsir Pendidikan Islam* (Jakarta: AMP Press, 2014).

Qur'an view the use of artificial intelligence, especially in the world of education? How can the formulation of educational strategies that can be done in anticipation of artificial intelligence technology so that humans are able to take the best benefits from ecology, without losing values in accordance with Islamic teachings?

Humans and The Privilege of Mind

Humans are creatures created by Allah Swt who were created with a unique intelligence, knowledge, and understanding that distinguishes us from animals, angels, and jinns. Man is endowed with reason, which is one of the potentials bestowed upon man that is used as a force for thought. Reason is one of the privileges possessed by humans that is not possessed by other beings, making him worthy of being a caliph. God as the Creator of all beings expressly states in sura at-Tin verse 4 that He has created man in the best possible form. Not only is it physical beauty, but God grants man a set of truth detectors that can be used in his life, namely "reason". God gives the favor of reason to man so as to elevate his degree to the level of godliness and ability to know and understand about his Rabb. This is the highest favor and glory that God bestows upon man.⁵

Reason comes from the Arabic word *'aql* (عقل) means common sense, mind.⁶ In Indonesian, reason means a thinking tool, thinking power (to understand, mind, memory).⁷ Reason also means the power of thought to understand something, the path or way of doing something, the power of effort.⁸ In the Oral al-Arab it is mentioned that *al-'aql* means *al-bijr* which means to restrain and curb lust. It goes on to explain that means *al-bijr* which means to restrain and curb lust. It goes on to explain that *al-'aql* contains the meaning of wisdom (*al-nuba*), Icloud from weak mind (*al-bumq*). *Al-'aql* also means heart (*al-qalb*), means understanding.⁹ Reason is the thinking force in man and one of the soul potentials that contains the meaning of thinking, understanding, and understanding.¹⁰

According to Imam al-Ghazali reason has four meanings, it should not be given one definition only for it but for each sense there is an individual definition. As for these notions, first, reason is a trait that distinguishes man from animals, and

⁵ There are a number of Verses from the Qur'an that talk about *'aql*, they are: 22:46, 7:179, 8:22, 24, 58:19, 59:20, 20:124, 127, 17:72, 10:5, 29:43, 14:52, 13:19, 3:190, 191, 6:125, 66:8, 64:11, 29:69, 10:9, 2:269, 8:29.

⁶ A.W. Wunawwir, *Kamus Al-Munawwir Arab-Indonesia* (Surabaya: Pustaka Progressif, 1997).

⁷ Poerwadarminta, *Kamus Umum Bahasa Indonesia* (Jakarta: Balai Pustaka, 1991).

⁸ Indrawan WS, *Kamus Besar Bahasa Indonesia* (Jombang: Lintas Media, 2010).

⁹ Abbudin Nata, *Pradigma Pendidikan Islam* (Jakarta: Grasindo, 2001).

¹⁰ Departemen Pendidikan Nasional, *Kamus Besar Bahasa Indonesia* (Jakarta: Balai Pustaka, 2005).

is a potential that can accept and understand knowledge based on thought, and reason is able to produce sophisticated products of thought. Quoting the opinion of al-Harits ibn Asad Al-Muhasibi when making a definition of reason, that "Reason is a *gharizah* (the original instinct of man) that causes man to have the potential to absorb various knowledge based on the mind. Reason is like light put into the heart, so that man has the readiness to absorb things.¹¹

Reason which is a gift of God and reason that can be obtained and developed by man through reasoning, education, and life experience.¹² Reason consists of the element of ratio and heart/taste. After man has thought/resisted the signs of God's dominion that lie upon nature or are written in His book, he will not acknowledge the existence of God if his heart is not functioning, for being blind, unsure and filthy. Likewise, something that makes sense is not necessarily rationalizable, because the functioning of the human ratio ability is very limited, his heart is blind and causes uncertainty. While something rational will be acceptable to reason, because in human reason there is an element of heart/trust. Man's intellect will function more and more properly, when the element of taste or heart is good, holy and always in faith.¹³

HUMAN INTELLIGENCE VERSUS ARTIFICIAL INTELLIGENCE

Artificial Intelligence, makes humans stutter about the great changes that affect life. There will be the emergence of technology that seems to be able to match human intelligence, appearing to be able to hear, see, speak, want, want, know, and be intelligent, but these new creatures are not alive and certainly do not have something like a soul. Biologically, the human brain is the center of all human body activities, both conscious and unconscious activities. The human brain, functions like a processor in a computer CPU (Central Processing Unit) for the human body, which consists of neural networks. Although technology is made intelligent by imitating the work of the nervous system in the human brain, it will certainly not be able to match the sophistication of the human brain made by Allah SWT. The verses of the Qur'an below can be used as a guide for humans, in facing the future, where technology will change the world by making technological products that are similar to humans.

إِنَّمَا إِلَهُكُمُ اللَّهُ الَّذِي لَا إِلَهَ إِلَّا هُوَ وَسِعَ كُلَّ شَيْءٍ عِلْمًا

Indeed, your Lord is only Allah, there is no god but He. (Thaha: 98)

¹¹ Imam Al-Ghazali, *Ilmu Dalam Perspektif Tasawuf Al-Ghazali*, ed. Muhammad Al-Baqir (Bandung: Karisma, 1996).

¹² Muhammad Quraish Shihab, *Tafsir Al-Mishbah Pesan Kesan Dan Keserasian Al-Quran* (Jakarta: Lentera Hati, 2005).

¹³ Choiruddin Hadhiri, *Klarifikasi Kandungan Al-Qur'an*, I (Jakarta: Gema Insani, 2005).

اللَّهُ الَّذِي خَلَقَ سَبْعَ سَمَاوَاتٍ وَمِنَ الْأَرْضِ مِثْلَهُنَّ يَتَنَزَّلُ الْأَمْرُ بَيْنَهُنَّ لِتَعْلَمُوا أَنَّ اللَّهَ عَلَىٰ كُلِّ شَيْءٍ قَدِيرٌ وَأَنَّ اللَّهَ قَدْ أَحَاطَ بِكُلِّ شَيْءٍ عِلْمًا

The God who created the seven heavens and from (the creation of) the earth is also similar. God's command applies to him, that you may know that God is almighty over all things, and the knowledge of God truly encompasses all things. (At-Talaq: 12)

In the Qur'an it is stated about the importance of the learning process, which is evidenced by the first command from Allah to man is to learn. The command is expressed through the first revelation of the Qur'an surah Al-Alaq verse 1.

اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ

Read by (mentioning) the name of your God who created. (Al-Alaq:1)

Man learns to solve all the problems of life, by learning and experience. Man is also given the sense to do reasoning, drawing conclusions based on the knowledge and experience he has. It is this activity of reasoning that distinguishes it from animals. This is as stated in Surah Al-Anfal [8]: 22 and surah Al-Mukminun [23]: 14.

إِنَّ شَرَّ الدَّوَابِّ عِنْدَ اللَّهِ الصُّمُّ الْبُكْمُ الَّذِينَ لَا يَعْقِلُونَ

Indeed, the worst of life in the sight of Allah are those who are deaf and dumb, those who do not understand. (Al-Anfal:22)

Man is so special compared to other beings, especially in the gift of reason. It is something that deserves to be realized that no matter how great and effective humans are in the 'creation' of robots through Artificial Intelligence technology, they will not be able to match God's creation. God said which means:

فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ

Blessed is Allah, the best of the creator. (Al-Mukminun:14)

An interesting explanation from a professor in the field of Artificial Intelligence who links between Artificial Intelligence and *Sunnatullah*. He added that the *sunnatullah* he is referring to here is the law or provision of Allah Azza wa Jalla which western scientists call *Nature's Law*, *Intelligent Design* and so on which include the laws of physics, biology, chemistry, astrology and so on. *Sunnatullah* is a system and rule prescribed by Allah Taala for humans, animals and all kinds of creatures in this world. *Sunnatullah* will not change and no one can change it since

Allah made it happen until any time. This is in accordance with the word of Allah Almighty which means: "For you will never find any change for *Sunnatullah*, you will never find any redemption for the journey of *Sunnatullah*." (Fathir: 43).

Artificial Intelligence in the Qur'an

The story of Artificial Intelligence is hinted at in the story in the Qur'an, in sura Thaha verses 85-99 which took place since the time of the Prophet Moses thousands of years ago, or what is known as the samiri story. God said:

قَالَ فَإِنَّا قَدْ فَتَنَّا قَوْمَكَ مِنْ بَعْدِكَ وَأَضَلَّهُمُ السَّامِرِيُّ

Then verily We have tested your people after you have left, and they have been misled by Samiri," (Qs. Thaha: 85).

In interpreting this verse Imam Al-Qurthubi took several opinions stating about who samiri is. First, from Ibn Abbas RA says, "Samiri used to come from a people who used to worship calves, then he came to the land of Egypt, and entered the religion of the Children of Israel by birth, but his mind still enjoyed worshipping calves. Secondly, some say that Samiri came from the tribe of Qibti, and he was his neighbor prophet Moses, then he had faith in Moses and came out with him. Thirdly, there are also those who say that he was one of the leaders of the Children of Israel who came from a Samirah caravan, they were known to live in the Levant. Said bin Jubair said, "he is from karman residents".¹⁴

فَرَجَعَ مُوسَىٰ إِلَىٰ قَوْمِهِ غَضْبَانَ أَسِفًا ۚ قَالَ يَقَوْمِ أَلَمْ يَعِدْكُمْ رَبُّكُمْ وَعَدًّا حَسَنًا ۚ أَقَطَّلَ عَلَيْكُمْ الْاِعْهْدُ اَمْ اَرَدْتُمْ اَنْ يَّجِئَ عَلَيْكُمْ غَضَبٌ مِّنْ رَبِّكُمْ فَاَخْلَفْتُمْ مَّوْعِدِي .

Then Moses returned to his people in anger and sorrow. Moses said, "O my people, has not your Lord promised you a good promise? Do you feel for how long the time has passed for you, or do you desire that the wrath of your Lord befall you, and you break your covenant with me?" (Thaha:86)

The Prophet Moses was saddened by the actions of his people, because they disbelieved in Allah SWT, while Allah SWT has promised them paradise if they obey Him, and promised them to listen to His words in the Torah through Moses' oral words so that they may know what is in it, so that they deserve their reward.¹⁵ Next is illustrated how the process of creating Artificial Intelligence (AI) by Samiri.

¹⁴ Al-Qurthubi, *Tafsir Al-Qurthubi* (Jakarta: Pustaka Azzam, 2007).

¹⁵ Syaikh Imam Al-Qurthubi, *Tafsir Al Qurtubi*, 11th ed. (Jakarta: Pustaka Azzam, 2008).

قَالُوا مَا أَخْلَفْنَا مَوْعِدَكَ بِمَلِكِنَا وَلَكِنَّا حَمِلْنَا آثَارًا مِّنْ زِينَةِ الْقَوْمِ فَقَذَفْنَاهَا فَكَذَلِكَ أَلْقَى السَّامِرِيُّ ۖ أَخْرَجَ لَهُمْ عِجْلًا
جَسَدًا لَهُ ۗ خُوَارٌ فَقَالُوا هَذَا إِلَهُكُمْ وَإِلَهُ مُوسَى ۖ فَانصَبِي ۗ — ٨٨

They said: We have not broken your covenant of our own accord, but we were told to carry the burdens of the jewels of the people, so we have thrown them, and so did samiri cast them. Then Samiri took out for them (from the pit) a calf of stature and voice, so they said: "This is your Lord and the Lord Moses, but Moses has forgotten,"(Thaha: 87-88).

Hamka mentioned in his interpretation that the idol that Samiri made was sound, that is, moaning like the carelessness of a cow, therefore they flocked to worship it. They also invite others who are not yet interested in being interested in worshipping the idol. This can be an afterthought for us today how foolish the easy people who are attracted by the statue of the calf, to the point of considering it as God.¹⁶ In the interpretation of Al-Qurthubi it is mentioned Ibn Abbas said the calf had a one-time voice and after that never made a sound again. Mujahid argued that the sound in the statue was like wind, because in the statue a cavity was made, so that when the wind was into the cavity it would make a sound, and it was actually lifeless (not alive).¹⁷

فَلَا يَرَوْنَ إِلَّا يَرْجِعُ إِلَيْهِمْ قَوْلًا ۖ وَلَا يَمْلِكُ لَهُمْ ضَرًّا وَلَا نَفْعًا

Then Have they not noticed that the statue of the calf cannot give them an answer, and cannot give them any depravity and not (nor) expediency? (Thaha:89)

If they ask, the calf cannot answer, if they ask, the calf cannot afford to give, because he is just an object. 18 In verses 88 and 89 it is mentioned that Samiri made a *jazad* in the form of a calf statue from gold. The *jazad* can make a sound. *Jazads* are objects that have no spirit and soul. This *jazad* is programmed by Samiri so that it can make a sound. But the *jazad* couldn't answer the question. The above verse gives *ibrah* about a calf statue that can be voiced, analogous to a robot or Artificial Intelligence in the present. This story contains the fact that man needs to be careful that this can lead people to stay away from the teachings of God. This verse reminds humans that technology can be a test and has the potential to mislead humanity. This can be symbolized by some of the people of the House of Israel who were fascinated to the point of making the golden calf of Samiri as God in place of God.

¹⁶ Hamka, *Tafsir Al-Azhar* (Jakarta: Pustaka PanjiMas, 1985).

¹⁷ Muhammad ibn Ahmad ibn Abi Bakar Al-Qurthubi, *Al-Jami' Li Ahkam Al-Qur'an*, ed. 'Abdullah ibn 'Abd al-Muhsin Al-Turki, 10th ed. (Beirut: Muasasah Risalah, 2006).

¹⁸ Hamka, *Some Challenges to the Islamic Ummah in the Present (Secularism, Syncretism and Ma'siat)* (Jakarta: Bulan Bintang, 1970).

On the other hand, technology is God's gift to humans to be a provision in order to answer God's challenges. That is, for man to explore or utilize the potential of heaven and earth as stated in the Qur'an Surah Ar-Rahman [55]: 33.

يٰۤمَعْشَرَ الْجِنِّ وَالْإِنسِ إِنِ اسْتَطَعْتُمْ أَنْ تَنْفُذُوا مِنْ أَقْطَارِ السَّمٰوٰتِ وَالْأَرْضِ فَانفُذُوا لَا تَنْفُذُونَ إِلَّا بِسُلْطٰنٍ

O jinn and human faction! If you are able to penetrate (cross) the corners of heaven and earth, then penetrate. You will not be able to penetrate it except by force (from God). (Q.S Ar-Rahman: 33)

Artificial Intelligence in Education

Artificial Intelligence is growing and increasingly commonly used in society. Examples of the increasing use of intelligence include smart phones, voice assistance, autonomous driving technology, home robotics, delivery robots, robots used in factories/offices/health facilities. We will increasingly be faced with the experience of transforming the use of Artificial Intelligence in daily activities, work, business, and education. With the rapid development of technology, further changes are inevitable. The use of Artificial Intelligence in the world of education, will provide many benefits and conveniences. Among other things, it opens up opportunities to improve the efficiency and effectiveness of the teaching and learning process, and prepare students for the world of work in the field of technology, improve support systems for students, improve the quality of teachers, minimize administration in schools and campuses, and enable the learning process. However, along with the developments that continue to occur, the attention and challenges will increase to be anticipated.

The challenges that must be faced by higher education include being able to prepare graduates who can compete in the world of Artificial Intelligence technology, ranging from skills, adaptability, and intelligence. So, to anticipate this, educational institutions, especially higher education, must improve, and prepare the values that are important for universities, including: 1) Developing freedom of thought and analysis, academic doubts, deep understanding, and the latest knowledge; 2) Initiative, reactivity, and entrepreneurial spirit for graduates 3) Further education agenda prepared by the school; and 4) *Human-centric* ethical norms.¹⁹ "The fourth industrial revolution seems to be creating fewer jobs in new industries than previous revolutions," said Klaus Schwab founder of the World Economic Forum and author of *The Fourth Industrial Revolutions* (2016). With the advancement of machine learning technology, AI, big data analytics, IoT, AR / VR, to 3D printing, work will shift from manual occupations and routine / repetitive jobs to cognitive / creative jobs. And later success is determined by the collaboration ability of "human + robot". That's from the hard skill side. For soft skills, Tony Wagner (2008) formulated "Seven Survival Skills for 21st Century" namely: critical

¹⁹ Grace Ufuk Taneri, *Artificial Intelligence & Higher Education, Research and Occasional Paper Series* (Berkeley: Center for Studies Higher Education, 2020).

thinking and problem solving; collaboration across network; agility and adaptability; Initiative and entrepreneurship; Accessing and analyzing information; effective communication; curiosity and imagination. Unfortunately, those seven skill-sets are minimally taught in our schools today. Therefore, our schools must redefine their curriculum by accommodating these new skill-sets.

To welcome the era of Education 4.0, several things that must be prepared include: 1) Preparing students with the ability to think critically and solve problems, being able to develop interpersonal communication well, creatively, and of course collaboratively; 2) Change the mindset of teachers and other education stakeholders to be more adaptive to technological developments in learning. This of course needs to be complemented by debriefing in the form of training skills in the use of technology adequately; 3) The need for curriculum adjustments to equip students with big data, artificial intelligence, and digital society in general; 4) Provide digital learning content that is easily accessible to all students. The provision of facilities such as learning houses that are already running well can be adopted and developed. Entering the learning house feels like an inspirational virtual class; 5) Using interactive learning methods, with interesting media. With the enrichment of Islamic values and the treasures of Islamic historical wealth, it feels like the digital visualization of Islamic Education is able to be so compelling and inspiring.

Meanwhile, at the level of Islamic Higher Education, it is necessary to adjust the learning curriculum to the ability of students in terms of data Information Technology (IT), Internet of Things (IoT), and Big Data Analytics, improving their abilities in the aspects of data literacy, technological literacy and human literacy. Second, it is necessary to reconstruct higher education institutional policies that are adaptive and responsive to the industrial revolution 4.0. Such a policy presupposes an openness and adaptiveness to developments. If we at least visit the e-learning pages of Harvard University and Massachusetts Institute of Technology (MIT), to name the world's leading universities, we will easily find open courses and lecture services digitally and free of charge. Digital and free services are widely developed and open to the public. The content and services are developed in such a way that various parties can benefit as much as possible from the perspective of the academic community of the leading campus. By adopting more or less the same thing, PTKI residents can develop a kind of *cyber university* without having to fear the loss of students because of free open courses and lectures. Developing free information that is useful and constructive will naturally make PTKI a forum for the good for mutual progress. Third, the preparation of human resources, especially lecturers and researchers, as well as engineers who are responsive, adaptive, and reliable with the support of educational, research, and innovation infrastructure that is also qualified. This condition allows PTKI to make breakthroughs in research and

development that support the Industrial Revolution 4.0 and related ecosystems without losing the identity of Islamic Higher Education.

Facing the increasingly complex era of the industrial revolution 4.0, the world of Islamic education will face various challenges. What is also not important is that in the educational process, the role of the teacher will not be able to be completely replaced by technology. The teacher of "technology" cannot set an example in the form of character values. Exemplary functions cannot be given by technology but must still be exemplified by humans. A learning approach that does not fully use Artificial Intelligence/Robot technology is needed. The process of transferring values and characters must still be carried out in achieving the goal of Islamic education itself, namely to become *kamil* people with the character of *karimah*. Technology will be more helpful from an administrative aspect that improves the efficiency and effectiveness of the learning process, by not eliminating the role of teachers who provide moral and exemplary transfers.

D. CONCLUSION

Artificial Intelligence technology can be used in functions that help humans administratively, but it does not eliminate the role of humans in the potential for reason in solving life problems, in various aspects of life, both in the world of work, business, and education. On the one hand, technology is God's gift to man to be a provision in order to answer God's challenges. That is, so that humans explore or take advantage of the potential of heaven and earth as stated in the Quran Surah Ar Rahman 33. But from the *tadabur* of Thahaa verses 85-99, the Samiri Story contains the *ibrah* that man needs to be careful that this can lead man to stay away from the teachings of God. This verse reminds humans that technology can be a test and has the potential to mislead humanity. This can be symbolized by some of the people of the House of Israel who were fascinated to the point of making the golden calf of Samiri as God in place of God.

With artificial intelligence technology, in addition to getting various conveniences and opportunities, Islamic education will face various challenges. The thing that must be a concern related to Islamic education, is to ensure the achievement of the goal of Islamic education itself, to make a human being with character and character. So here is the critical thing that in the educational process, the role of the teacher will not be able to be completely replaced by technology. The teacher of "technology" cannot set an example in the form of character values. Exemplary functions cannot be given by technology but must still be exemplified by humans. A learning approach that does not fully use Artificial Intelligence/Robot technology is needed. The process of transferring values and characters must still be carried out in achieving the goal of Islamic education itself, namely to become *kamil* people with the character of *karimah*. Technology will be more helpful from an administrative aspect that improves the efficiency and effectiveness of the learning process, by not eliminating the role of teachers who provide moral and exemplary transfer.

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