

# MAKALAH SAINS-TEKNOLOGI DALAM PERSPEKTIF ISLAM

*by* Artikel Ahmad Zainuri

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# SCIENCE AND TECHNOLOGY OF ISLAMIC PERSPECTIVE

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<sup>13</sup>**Abstract:** This paper aims to describe science and technology from an Islamic perspective. The vital principle is that science and technology must be based on the human essence. Humans as subjects and objects of Islamic education have the potential for tawhid (religious nature), reason, heart (*qalb*), and body. Because of that human essence, the purpose of human creation is to become the Caliph of Allah on earth. To be in line with human creation goals, the concept of modern science and technology should not be dichotomous so that humans do not have split personalities in society. Realizing this fact, it is necessary to integrate modern science-technology with Islamic teaching values.

## I. Introduction

The dichotomy debate - modern science and Islamic science - is still a crucial problem among Muslim scholars today. Islamic science is understood as science based on revelation, the Hadith of the Prophet, and the scholars' *ijtihad*. Meanwhile, modern science is science based on experimentation and human reasoning based on empirical data through <sup>11</sup>research. Both sciences have their respective areas, separate from one another, both in terms of formal-material objects, research methods, criteria for truth, and their roles.

Indeed, there are already ideas or ideas among Muslim scientists to integrate the two sciences through the Islamization of science or the integration of science to neutralize the influence of modern Western science. This idea was initiated by <sup>18</sup>Syed Muhammad Naquib al-Attas and Isma'il Raji al-Faruqi.<sup>1</sup>

For al-Attas, science's Islamization is the liberation of knowledge from an interpretation based on secular ideology and from secular human meanings and expressions.<sup>2</sup> According to al-Attas, the knowledge that has spread to the middle of the world community, including the Islamic community, has been colored with Western culture and Civilization. Meanwhile, Western Civilization has produced confusion. Civilization born from Western knowledge has lost its essence, causing chaos in human life. Therefore al-Attas views that Western Civilization is not suitable for consumption before being selected and sorted, the real from the mixed with fakes.<sup>3</sup>

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<sup>6</sup><sup>1</sup>Muhaimin, *Arah Baru Pengembangan Pendidikan Islam, Pemberdayaan, Pengembangan Kurikulum, hingga Redefinisi Islamisasi Pengetahuan*, (Bandung: Nuansa, 2003), h. 330.

<sup>2</sup>Abdullah Ahmad Na'im, dkk, *Pemikiran Islam Kontemporer*, (Yogyakarta: Jendela, 2003), h. 337.

<sup>3</sup> *Ibid.*, h.338.

Meanwhile, al-Faruqi's view is that the Islamization of knowledge must observe several principles, which are Islam's essence. To reclaim disciplines under the framework of Islam means making theories, methods, principles, and goals subject to Allah's unity, the unity of the universe, the unity of truth and knowledge, the unity of life and the unity of humankind.<sup>4</sup> According to al-Faruqi, Western Civilization and westernization have had negative effects on Muslims. On the one hand, Muslims have become acquainted with modern Western Civilization, but on the other hand, they have lost their solid ground, namely a way of life that is based on religious morals. As a result, it is difficult for Muslims to choose the right direction. Therefore, Muslims finally seems to take an ambiguous/split personality. This dualism view is the cause of the decline experienced by Muslims. To get rid of this dualism, knowledge must be Islamicized.<sup>5</sup> Al-Faruqi said that before Muslims experience corruption and decline, they must develop and clarify modern scientific disciplines following the world view and Islamic values.<sup>6</sup> The Islamization program of al-Faruqi's science consists of 12 work programs and then these work programs are used as the 5 bases for the object of the work plan for the Islamization of science.<sup>7</sup>

However, the ideas of al-Attas and al-Faruqi conflicted with Ziauddin Sardar. He even criticized the concept of the Islamization of science initiated by Isma'il Raj'i al-Faruqi. Sardar's criticism is directed at the opinion that there is a relevance between Islamic science and Western science. He disagreed with al-Faruqi, who stated the need for mastery of Western science to master Islamic science. Sardar explained that all knowledge is born from a particular viewpoint and a hierarchical point of view, it is subject to that view. Therefore, efforts to find epistemology should not be initiated by providing a foundation for modern science. Because the Islamization of contemporary science can only occur with a paradigm that examines the external application of

<sup>4</sup>Didin Saefuddin, *Pemikiran Modern dan Postmodern, Biografi Intelektual 17 Tokoh*, (Jakarta : Grasindo, 2003), h. 163.

<sup>5</sup>Ramayulis dan Syamsul Nizar, *Ensiklopedi Tokoh Pendidikan Islam, Mengenal Tokoh Pendidikan Islam di Dunia Islam dan di Indonesia*, (Ciputat: Quantum Teaching, 2005), h.110.

<sup>6</sup>*Ibid.*, h.129.

<sup>7</sup>Keterangan lebih lanjut lihat Ismail Raj'i al-Faruqi, *Islamisasi Pengetahuan*, terj. Anas Mahyudin, (Bandung, Pustaka, 1995); lihat juga Khudori Soleh, "Mencermati Konsep Islamisasi Ilmu Ismail Raj'i Al-Faruqi". Dalam *Jurnal Studi Islam Ulul Albab*, Vol. 12, No. 1, (Malang: Fakultas Psikologi UIN Maliki Malang, 2011).

Islamic Civilization with current reality needs. If we persist in such a way of thinking, it is limited to exploiting Islamic knowledge, but still using a Western thinking style.<sup>8</sup>

Sardar emphasized the need to create a contemporary Islamic science as a counter to modern Western science. Namely, a system of knowledge based on Islamic values. This idea is different from Nasr, who explored his criticism from the perspective of the traditionalists. Sardar intelligently makes use of criticism from Western philosophers and historians of science, especially environmentalist thinkers and even left radical groups in the West that have emerged since the 1960s. His criticism led to the neutrality of modern science and the significant influence of modern Western culture in science and its effects.

Sardar provides a solution by saying that the Islamization of science must depart from building an Islamic epistemology to produce a knowledge system built on the pillars of Islamic teachings. Therefore, according to Sardar, what is needed is a radical re-orientation of science to the epistemological level and filling its worldview with Islamic values to form an Islamic science that is more in line with the physical and spiritual needs of Muslims. Sardar calls this effort the contemporization of Islamic science. Sardar's epistemological values are ten values: monotheism, Khilafah, worship, 'ilm, halal, haram, 'adl vs zulm, istishlah vs dhiya'.<sup>9</sup>

It must be admitted among Muslim scientists that there are still different views in efforts to Islamize science. This is natural because of differences in educational backgrounds, scientific disciplines and socio-cultural settings of each scientist.

In this context, this paper is very important to study the transformation of science's philosophical paradigm, especially concerning integrating science and technology in an Islamic perspective. This research attempts to build a platform that science and technology must refer to divine knowledge (revelation) and human knowledge (sensory and rational), which have a bearing on Allah SWT. As Kuntowijoyo said, the main point of the concept of scientific integration is the unification (not just a combination) of God's revelation and the findings of the human mind.<sup>10</sup>

<sup>8</sup>Abdullah Ahmad Na'im, dkk., *Pemikiran Islam Kontemporer*, (Yogyakarta: Jendela, 2003), h. 338.

<sup>9</sup>*Ibid*, h. 338.

<sup>10</sup>Kuntowijoyo, *Islam sebagai Ilmu*, (Yogyakarta: Tiara Wacana, 2006), h. 55.

## II. Human Nature

In the view of Imam al-Ghazali in the books of *Jawahir al-Qur'an* and *Ihya' Ulm al-Din*, as quoted by Yahya Jaya, the concept of man according to al-Qur'an is composed of material and immaterial or physical and spiritual elements. However, he emphasized the meaning and nature of human events in the spiritual or soul. Essentially, man is his soul. The human soul can feel, think, will, and do more. Strictly speaking, the soul becomes the essential essence of humans because of its lative, spiritual, *robbani* and immortal nature after death.<sup>11</sup>

To show the meaning of spirit/soul, said Hasan Langgulung, Imam al-Ghazali used four terms: *al-qalb*, *al-ruh*, *al-nafs* *al-'aql*.<sup>12</sup> According to Imam al-Ghazali in his book *Wonders of the Heart*, the four words each have two meanings. In the first sense, *al-qalb* means physical *qalb*; *al-ruh*, which is physical; *al-nafs* means lust and anger; and *al-'aql* implies knowledge. Whereas in the second sense, the four terms have the same meaning: the human soul or spirituality, which are *latif*, *rabbani*, and spiritual, which are the essence, the self, and the human essence. Therefore, humans in the first (physical) sense do not return to God, and in the second (soul) return to Him.<sup>13</sup>

Yahya Jaya's opinion regarding Imam al-Ghazali's insight into humans, as explained above, seems to have something in common with M. Yasir Nasution's dissertation research results. In M. Yasir Nasution's dissertation, it was said that Imam al-Ghazali used the terms *al-qalb*, *al-ruh*, *al-nafs*, and *al-'aql* as an expression of human nature. He called the four terms words which have the same meaning (*al-alfazh al-mutaradifat*).<sup>14</sup> The use of these four terms is probably based on a desire to reconcile philosophical and Sufism concepts. Because philosophers often use *al-nafs* and *al-'aql*, *al-ruh* and *al-qalb* are often utilized by Sufis<sup>15</sup> or often referred to as theosufi.<sup>16</sup>

<sup>11</sup>Lihat Yahya Jaya, *Spiritualisasi Islam*, (Jakarta: Ruhama, 1994), h. 26.

<sup>12</sup>Hasan Langgulung, *Teori-Teori Kesehatan Mental* (Jakarta: al-Husna, 1986), h. 369.

<sup>13</sup>Penjelasan lebih detail mengenai keempat *al-qalb*, *al-ruh*, *al-nafs*, dan *al-'aql*, menurut Imam al-Ghazali dapat dilihat dalam karya Imam al-Ghazali, *Keajaiban Hati*, terj. Nurchikmah, (Jakarta: Tintamas, 1984), h. 1-5. Lihat juga Yahya Jaya, *Spiritualisasi Islam*, h. 29.

<sup>14</sup>M. Yasir Nasution, *Manusia Menurut al-Ghazali*, (Jakarta: Raja Grafindo Persada, 1996), h. 83.

<sup>15</sup>*Ibid.*, h. 84.

<sup>16</sup>Teosofi (gabungan filsafat dan tasawuf). Wacana teosofi klasik dalam dunia Islam pertama sekali diperkenalkan oleh Abû Yazîd al-Busthâmî. Nuansa filsafat yang mewarnai pemikiran sufistiknya terlihat dari gagasannya mengenai konsep *ittihâd* (penyatuan). Menurutnya, sufi akan sampai pada penyatuan dengan Tuhan melalui *fanâ' al-nafs* ("penghancuran diri") dan *baqâ'* (hidup terus menerus), yaitu kesadaran diri terhadap hilangnya wujud jasmani, namun tetap disadari kekalnya wujud ruhani.

M. Yasir Nasution's research on the concept of man according to al-Ghazali, concluded; "The human essence is a soul called *al-qalb*, *al-ruh*, *al-nafs*, and *al-'aql*, which is an immaterial substance that stands alone, comes from the realm of *al-amr*, has no place, has the ability to know and move, has properties. Eternal and created foundation (not *qadim*)".<sup>17</sup> But in another opinion, Ali Issa Othman said that in al-Ghazali's view, the thing that distinguishes humans from other creatures is the nature of their spirits, which are equated with humans' essence.<sup>18</sup>

In this case, the soul is the antithesis of the body (*al-jism*), which forms man's reality. In this context, Imam al-Ghazali views that the body elements (*al-jism*) are the imperfect parts of humans. It consists of material factors, which at any point in their composition can break down. Therefore, it has no power at all. He only has a natural principle (*mabda 'thabi'i*), which shows that he submits to outside forces.<sup>19</sup> Furthermore, in terms of creating the soul and its relationship to the body, Imam al-Ghazali stated that the soul was not completed due to readiness to receive it (*bi al-isti'dad al-khash*), but was created when there was readiness (*'ind al-isti 'dad al-khash*).<sup>20</sup> According to M. Yasir Nasution's understanding, this shows that there is no relationship between soul and body, in the sense that one causes another.<sup>21</sup> But after the two have manifested (united), there is an understandable relationship between the two; one of which affects the other. This relationship is no longer in existence but in terms of activity, which is seen in factual reality. To demonstrate this relationship, al-Ghazali likened the body to clothing and the soul to the person who is dressed. This relationship shows the activity relationship; The one who holds the initiative is the person who dresses and the clothes are the tools used to achieve the goal. This means that the body is a tool for the soul to manifest its actions.<sup>22</sup>

There is no physical relationship between soul and body, which underlies al-Ghazali's argument about the soul or spirit's immortality. According to him, entering *al-nafs* into an accident leads to the conclusion that *al-nafs* is not eternal; because

<sup>17</sup>M. Yasir Nasution, *Manusia Menurut al-Ghazali*, h. 128.

<sup>18</sup>Ali Issa Othman, *Manusia Menurut al-Ghazali*, terj. Johan Smit, Anas Mahyuddin, dan Yusuf, (Bandung: Pustaka Salman, 1981), h. 117.

<sup>19</sup>M. Yasir Nasution, *Manusia Menurut al-Ghazali*, h. 90.

<sup>20</sup>*Ibid.*, h. 117.

<sup>21</sup>*Ibid.*, h. 90.

<sup>22</sup>*Ibid.*, h. 117-118.



accidents<sup>23</sup> do not stand alone and are impermanent. It will be destroyed by the destruction of the substance which holds it (body, pen). Something which is impermanent cannot be made the essence (essence, pen) of man.<sup>24</sup> Therefore, he emphasized that *al-nafs-al-nafs* in the sense of essence-is a single immaterial substance that stands alone and cannot be destroyed. Singular means indivisible; and standing alone means his existence independent of the body.<sup>25</sup>

Al-Ghazali's opinion about the existential structure and human nature has similarities with other Muslim philosophers and thinkers' opinions.<sup>26</sup> Thus, for example, Ibn Sina said that humans consist of two elements, namely, soul and body. The body component with all its members is a tool for the soul in carrying out its activities. From that, the soul is fundamentally different from the body which is always changing, changing, excess and diminishing, so that it experiences transience after being separated from the soul.<sup>27</sup> It is different from the soul as a substance (Jauhar), a spiritual self that stands alone and eternal after separating from the body.<sup>28</sup>

Ibn Sina's statement implies that the soul is a spiritual substance that is different from the body; the soul is eternal and the body is mortal, so man's essence is his soul.<sup>29</sup> Although Plato's thought style heavily colored Ibn Sina's thoughts, the two differed in terms of the relationship between the soul and the body. According to Plato, humans consist of two elements: material body elements and non-material soul elements. This so-called soul has humanized man. However, the soul and body are not unity but parallel dualisms. The soul comes before the body. This he called that the soul

<sup>23</sup> Aksiden: kualitas atau atribut atau ciri karakteristik dari suatu substansi. Ini berarti bahwa suatu aksiden tidak terdapat<sup>22</sup> dalam atau dari dirinya sendiri tetapi tergantung pada sesuatu yang lain. Lihat Ali Syaifulloh H.A., *Antara Filsafat dan Pendidikan*, (Surabaya: Usaha Nasional, th), h. 171.

<sup>24</sup>Lihat M. Yasir Nasution, *Manusia Menurut al-Ghazali*, h. 73-74.

<sup>25</sup>*Ibid.*,

<sup>26</sup>Kritik al-Ghazali tentang<sup>16</sup> puluh kesalahan para filosof muslim dan para filosofi pada umumnya ,dapat dibaca dalam bukunya *Tahafut al-Falāsifah*, terj. Ahmadi Thaha, (Jakarta: Pustaka Panjimas, 1986). Dari dua puluh masalah ini, ada tiga pikiran filsafat metafisika yang menurutnya sangat berlawanan dengan Islam, dan yang oleh karenanya para filosof harus dinyatakan sebagai orang ateis, yakni: (1) qadimnya alam; (2) tidak mengetahuinya Tuhan terhadap<sup>15</sup> peristiwa-peristiwa kecil; dan (3) peningkaran terhadap kebangkitan jasmani. Uraian lebih lanjut baca A. Hanafi, *Pengantar Filsafat Islam*, (Jakarta: Bulan Bintang, 1990), h. 144-152.

<sup>27</sup>Lihat Ahmad Daudy, *Kuliah Filsafat Islam*,(Jakarta: Bulan Bintang, 1986), h. 78.

<sup>28</sup>*Ibid*, h. 83.

<sup>29</sup>*Ibid.*, h. 78.

had pre-existence,<sup>30</sup> that is, before we were born. So before we gain a physical status, we are already pure souls and live in a higher region where we perceive a spiritual world.<sup>31</sup>

In this regard, Ibn Sina emphatically denies a soul's existence before the body or soul has pre-existence. For Ibn Sina, the human soul does not exist in a state of separation from the body and then residing in it.<sup>32</sup> That is, the soul is made new every time the body that can use it is made. Other Muslim philosophers, such as al-Kindi, also discussed human nature, although not in detail and detail. The thought of al-Kindi, which was heavily influenced by Aristotle, revealed that the human soul is the first perfection for natural jism with potential life. And elsewhere, he says that the soul is the organic perfection of the natural jism, which receives energy.<sup>33</sup>

### III. Modern Science-Technology Paradigm

In the 21st century has appeared The "New Left", which was pioneered by the Frankfurt School figures to complement the fall of modernism's rationality. Through philosophical-sociological analysis and psychoanalysis, they expose modern society's behavior such as greed for natural resources, irrationality, consumerism, tyranny, hegemony, fascism, and tribalism. Modern man has become the robot and the little screw of a social machine that can no longer think straight about choosing what is truly good for him, based on the nature of his own consciousness.

According to Jalaluddin Rakhmat; "When they got rid of God, Allah, they were not only alienated from Allah. They are thrown into the world without knowing where to go. They got lost. "As a result of the project of human sovereignty which was inaugurated by the renaissance and Aufklarung (reform) which has failed, because modern humans have been shackled by new myths, new idols, new illusions, new superstitions, and new gods! Their wild adventures have shackled people until they are lost and thrown from themselves, alienated from the universe and the True God.<sup>34</sup>

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<sup>30</sup>I.R. Poedjawijatna, *Manusia Dengan alamnya (Filsafat Manusia)*, (Jakarta: Bina Aksara, 1987), h. 67-68.

<sup>31</sup> P. A. van der Weij, *Filsuf-Filsuf Besar Tentang Manusia*, diIndonesiakan oleh K. Bertens A. A. Nugroho, (Jakarta: Gramedia, 1988), h. 21.

<sup>32</sup>Ahmad Daudy, *Kuliah Filsafat Islam*, h. 83.

<sup>33</sup>Ahmad Daudy, *Kuliah Filsafat Islam*, h. 20.

<sup>34</sup>Jalaluddin Rakhmat, *Islam Aktual*, (Bandung: Mizan, 1997).



Recent developments in modern science-technology have exceeded the expectations of modern humans. Modern humans have broken the belief in positivism's scientific understanding<sup>35</sup> which seems so far the two pillars of their faith. The emergence of modern physics with the emergence of Einstein's theory of relativity and quantum mechanics has demolished the classical mechanics' approach and the Newtonian mechanistic-positivist paradigm that modern humans had for three centuries. According to Nasr, renaissance humanistic anthropology was the background that led to the scientific revolution in the 17th century AD and the creation of modern sciences that were non-human. Human rational reason is considered the most anthropomorphic and the most likely form of modern science-technology, which makes humanist reasoning and empirical data based solely on the human senses the only criterion for the validity (validity) of all knowledge.<sup>36</sup>

The development of modern science-technology has given birth to the face of human civilization that is "inhumane" because of the domination of the secular-materialistic worldview mixed with agnosticism, anthropoid-centrism and atheism, as a tool and "basic philosophy" of the ideology of liberalism-capitalism materialism. capitalism.<sup>37</sup> In its turn, the domination of secular-materialistic modernism has caused many crucial and severe problems for human life on earth. Multidimensional crises that occur from day to day have frightened most of the world today, without modern humans being able to solve their fundamental problems entirely and comprehensively.

As stated by the Frankfurt School, various fields of life in modern society, such as art, science, political economy and culture, have become confused because they are veiled by ideologies that benefit certain parties, which at the same time alienate individual humans in their society.<sup>38</sup> The development of modern science-technology, which is based on empiricism and rationalism, has positioned humans as

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<sup>35</sup> One of radical variant of Cartesian-Newtonian Paradigm is Positivism. Positivism paradigm placed language and the method of physical sciences as the only methods for scientific activity, including for social sciences and cultures. The concepts in psychology, sociology, politics and anthropology were said scientific if refer to basic principles of Newtonian physics. Even for Egon G. Guba,, Cartesian-Newtonian paradigm is identical with positivism, since assumed with dualistic epistemology (determination between subject and object). Lihat Egon G. Guba (edited), *The Paradigm Dialog*, (California: Sage Publication, 1990).

<sup>36</sup> Seyyed Hossein Nasr, *Knowledge and the Sacred*, Chap. 5, (Albany (NY): the State University of New York Press, 1999), h. 160-188.

<sup>37</sup> Seyyed Hossein Nasr, *Islam and The Plight of Modern Man* (Revised and Enlarged Edition), (Chicago: ABC International Group, Inc, 2001), h. 5

<sup>38</sup> Jurgen Habermas, *Ilmu dan Teknologi sebagai Ideologi*, (Jakarta: LP3ES, 1990).

anthropocentrism. Humans free themselves from the divine order to build an anthropomorphic order, namely a charge that is solely human-centered. Humans become "masters" of their destiny, which results in disconnection from their spirituality.<sup>39</sup> Independence of reason (rationality) and the empirical reality that has been dated from the religious frame gave birth to the secularization of modern science-technology. According to R. H. Tawney, towards the end of the 17th century AD, the secular branches of knowledge were practically disconnected from the Divine and the sources of the secular branches of knowledge were expressed as a human reason that was not connected with the Divine.<sup>40</sup>

In fact, wrote Jalaluddin Rakhmat, after theology was removed from the realm of modern science-technology in the 17th century AD, scientists were required to remove any value considerations from their scientific endeavors. Modern science-technologies must be based on value-free scientific objectivity.<sup>41</sup> Understanding that modern science-technology is value-free or knowledge of modern science-technology is value-laden, affects human life directly.<sup>42</sup>

In Germany, the Frankfurt school's critical theory was born, which was counter-positivism and rejected the value-free view of modern science-technology. According to this *mazhab*, behind the "veil" of contemporary science and technology's hidden power interests.<sup>43</sup> One of the founders of critical theory, Herbert Marcuse, highlighted how modernity's rationality functions as ideology and myth. He also emphasized that modern social scientists' thinking has frozen into ideology and myth.<sup>44</sup> It becomes ideological because positivism claims that only its methods allow objective truth about facts.

The explanation above leads us to the conclusion that modern sciences are not value-free. But, as Achmad Baiquni said, modern science-technology contains values that infiltrate through the experts' consensus who developed it. It is loaded with their

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<sup>39</sup>Lihat Azyumardi Azra, "Tradisionalisme Nasr, Eksposisi dan Refleksi". Dalam *Ulumul Qur'an*, Nomor. , Volume. IV, 1993, h. 107.

<sup>40</sup>Dikutip dari Amrullah Ahmad, "Pendidikan Dalam Perspektif Epistemologi Islam". Dalam *Media Dakwah*, Nomor. 250, April 1995, h. 39.

<sup>41</sup>Dikutip dari Fachry Ali dan Bachtiar Effendy, *Merambah Jalan Baru Islam*, (Bandung: Mizan, 1992), h. 242.

<sup>42</sup>Ahmad Tafsir, *Filsafat Ilmu*, h. 46; dan Harold Kincaid dkk., *Value-free science?*. (Oxford: Oxford University Press, 2007), h. 4.

<sup>43</sup>Asep Ahmad Hidayat, *Filsafat Bahasa*, (Bandung: Remaja Rosdakarya, 2009), h. 207.

<sup>44</sup>F. Budi Hardiman, *Kritik Ideologi*, h. 73.

cultural values.<sup>45</sup> Modern science-technologies were born and developed in the context of specific values, paradigms and civilizations. This is where, as Kuhn said above; scientists work in a particular belief system or paradigm. Therefore, in Kuhn's epistemology, there can be no value-free, neutral, and objective science. Because the choice of paradigm is made on purely axiological considerations

#### **IV. Science-Technology and Islamic Education: The Importance of Scientific Paradigm Integration**

In the perspective of science epistemology, there is no separation between one scientific discipline and another. For example, Imam al-Syafi'i in his monumental work *al-Umm* based his description of his masterpiece by positioning al-Qur'an and Hadith as the primary sources of scholarship. The two guidelines establish fundamental principles and procedures for humans to achieve happiness in this world and the hereafter.

In line with him, other classical Islamic scholars combine three aspects to integrate science: spiritual, intellectual, and moral. The relationship between these three aspects is closely aligned with the cohesion of faith, sharia, and morals. In a similar format, al-Ghazali describes the unity of three elements, namely, *qalb* (heart), *'aql* (intellect), and *nafs* (lust). It is no less interesting when Ibn Khaldun explained that human science is a natural human phenomenon from two primary references, namely revelation and nature (the universe).<sup>46</sup>

The explanation above becomes an indisputable argument that the discussion about science-technology integration has also existed before being discussed in the last few decades. The discourse on the integration of science by classical scholars has addressed this concept's continuation, which can be called "transcending the context of its time". The term that is often associated with it "science-technology integration" is "Islamization of science-technology" (Islamization of knowledge), which requires two primary principles. First, the main source of all knowledge and knowledge is the Qur'an and Hadith. Second, the method used to acquire knowledge and knowledge must be Islamic.

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<sup>45</sup>Achmad Baiquni, "Filsafat Fisika dan al-Qur'an". Dalam *Ulumul Qur'an*, No. 4, Vol. 1, 1990, h. 12.

<sup>46</sup>W. Mohd Azam. Mohd Amin, "A Preliminary Analysis of The Classical Views of The Concept of Integration of Knowledge". Dalam *Revelation and Sciences*, 04, No. 02, 2014, h. 14.

To realize these efforts, it takes the fulfillment of 4 (four) criteria, namely nature, natural law, Islamic teaching (principles and directions), and Islamic values (morals and aesthetics).<sup>47</sup> In this context, Kuntowijoyo emphasized that the main point of the integration concept is the unification (not just an amalgamation) between God's revelations and the findings of the human mind.<sup>48</sup> According to him, the idea of integration is to give a proper proportion to God and humans in science. In this way, modern science-technology integration is not "secularism", nor is it "asceticism". He is expected to resolve the conflict between extreme secularism and radical religions in many sectors.

Imam Suprayogo also defines the integration of modern science-technology as the positioning of the Qur'an and Hadith as a grand theory for modern science-technology.<sup>49</sup> In this way, naqli's arguments can be integrated with the findings of science. The birth of the integration concept was based on the dichotomy between the religious sciences and the general sciences. The two of them were separated and seemed to be walking in their respective shaded areas. It is also triggered by the separation between the Islamic education system and the modern education system, which has a latent impact on Muslims. The developing assumption is that "science does not care about religion, so (on the contrary) religion ignores science". This also implies developing the slogan "science for science", which often creates ethical values in its implementation. Science and religion seem to be two different entities and separate from each other, having their respective areas, both formal objects - scientific materials, research methods, criteria for truth, the roles played by scientists, even to the organizing institution's level.<sup>50</sup>

Kuntowijoyo gave a different viewpoint by introducing another model that "appreciates" secular science more. According to him, modern secular science-technology is a joint product of humankind, while integralists science (later) is a joint product of all believers. He emphasized that all of us are now products, participants and consumers of secular sciences so that they should not be looked down upon.

<sup>47</sup> Fouzia Ferdous dan Muhammad Athar Uddin, "Toward Islamization of Science and Technology". Dalam *IJUC Studies*, Vol. 9, No. 9, 2011, h. 236.

<sup>48</sup> Kuntowijoyo, *Islam sebagai Ilmu*, (Yogyakarta: Tiara Wacana, 2006), h. 55.

<sup>49</sup> Imam Suprayogo, "Membangun Integrasi Ilmu dan Agama: Pengalaman UIN Malang". Dalam Zainal Abidin Bagir (ed), *Integrasi Ilmu dan Agama: Interpretasi dan Aksi*, (Bandung: Mizan, 2005), h. 49-50.

<sup>50</sup> Amin Abdullah, *Islamic Studies di Perguruan Tinggi: Pendekatan Integratif-Interkoneksi*, (Yogyakarta: Pustaka Pelajar, 2012), h. 92.

Appreciation of secular science can be done by criticizing it and continuing its journey. There are two sources of knowledge: God (revealed knowledge) and that which comes from humans (secular), both of which are termed theo-anthropocentrism. He admitted that crises currently plague modern secular science-technology (cannot solve many problems), stagnant (closed to alternatives), and contain biases such as philosophical, Civilization, religious, economic, ethnic, gender, political, and other that.<sup>51</sup>

Basically, Islamic teachings do not recognize the dichotomy principle between Islamic science (Islam) or non-religious modern science-technology. Islam strongly recommends that everyone pay attention to the verses of the *qauliyah* (al-Qur'an) and use reason in understanding them. It is in this context of using the reason that the utility of non-religious disciplines based on systematic scientific reasoning is needed.

The combination of Islamic teachings (al-Qur'an and Hadith) and non-religious sciences is necessary in developing Islamic studies. The reason is, if it does not accommodate a scientific approach in the study of Islamic teachings (al-Qur'an and Hadith), then the product of the research will be "sky", aka "not set foot on the earth". This will impact the lack of interest in al-Qur'an reviewers to make al-Qur'an the object of study. Several verses from the al-Qur'an mention the urgency of the context for the integration of the two. The concept of *ulul albab*, for example, is mentioned in the QS. Ali 'Imran: 190, requires a combination of two ideas at once, namely *dzikr* and *fikr*. The concept of *dzikr* marks the *uluhiyah* (divine) dimension, while the idea of *fikr* is a scientific dimension. Both must be integrated in order to give birth to valuable scientific concepts.

In the process of integrating modern science-technology into Islamic teachings, according to Muchlis M. Hanafi,<sup>52</sup> there are several value principles. First, the focus of *istikhlaf*. In many verses of the al-Qur'an, it is explained that humans' function as Caliph (representative) of God will develop and build the earth with all its challenges to be appropriately inhibited to bring people to know their God. Second, the principle of *tawazun* (balance). One of the basic principles of Islamic thought is to maintain a balance between spiritual and material needs. Third, the focus of the *taskhir* (conquest). In the view of Islam, nature, with all its laws, has been subjected to humans to carry out the Caliph's functions properly. Islam does not see nature as possessing a power that

<sup>51</sup> Kuntowijoyo, *Islam sebagai Ilmu*, h. 50.

<sup>52</sup> Muchlis M. Hanafi, "Integrasi Ilmu dalam Perspektif Al-Qur'an". Dalam *Jurnal Suhuf*, Vol. 3, No. 2, (Jakarta: Balitbang Kemenag RI, 2010), h. 185-190.



humans cannot avoid, except by prostrating to it, and not as an enemy to be conquered, but by making it a means to build a harmonious life between humans and nature. Fourth, the principle of the relationship between the Creator and His Creation. Science, in the view of Islam, aims to prove the close relationship between the Creator and His creation. Through scientific discoveries, many scientists have proved that the harmony and order of this nature are under the control of the God.

The principle of integration of modern science-technology in Islamic teachings should be following the concept of human nature as the subject and object of Islamic education as the noblest and best creatures of Allah who have been equipped with a set of potentials. Humans have various possibilities, including tawhid (religious *fitrah*), reason, heart (*qalb*), and body. Apart from this positive potential, there is also a negative potential in humans, which is a human weakness, such as the potential to fall into the temptation of lust and demons. Therefore, humans are said to be paradoxical creatures, that is, they tend towards both good and bad.

With the potential that humans have, Islamic education's primary goal must be in line to create humans as caliphs of Allah SWT on earth to carry out Allah's laws legally and prosper the universe. Thus, for all human potential to grow and develop properly, undoubtedly, the concept of science and technology that is not dichotomous is needed. This is because science and technology are loaded with Western civilization values that are more concerned with the senses and rationality and ethically neutral. It is precisely what will give birth to people who have split personalities in society. Furthermore, human regeneration appears humans who separate social, political, economic, scientific, and technological life from Islamic teachings.

## V. <sup>19</sup> Conclusion

Based on the description above, it can be concluded that in essence, humans are formed from a series of two substances, namely; material components; material derived from the essence of the soil, and immaterial elements; the spirit that was “blown” by Allah Almighty and the essence of man is the spirit as himself. Humans have been equipped with a set of potentials, namely, the potential of tauhid (religious *fitrah*), mind, heart (*qalb*), and body. Apart from this positive potential, there is also a negative potential in humans, which is a human weakness, such as the potential to fall into the temptation of lust and demons. Therefore, humans are said to be paradoxical creatures, that is, they tend towards both good and bad.



The purpose of human creation is to become the Caliph of Allah on earth. To be in line with the goals of human creation, the concept of modern science and technology should not be dichotomized so that humans do not have split personalities in society. Realizing this fact, it is necessary to integrate modern science-technology with Islamic teaching values.

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