PRINCIPLES AND CASE STUDIES OF AN ISLAMIC APPROACH FOR SCIENCE EDUCATION

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Abstract:

The way of teaching science in Western schools has become the main channel for developing secular minds. Due to the strong technological and economic impact of science in today's world, teaching science through a religion-averse approach would be a successful recipe for developing a secular society. Islamization efforts aimed at deprogramming the secular orientation in science teaching and restoring the compatible position of science with the Islamic world view. In continuation of such efforts, this article is written for Muslim scientists and educators who aspire to align science presentation with their faith. The article discusses ten aspects to be mended in the current practices of science teaching. Each aspect is presented through an Islamic principle, supplemented with a few case studies. Science presentation through an Islamic lens is meant to elevate science from a collection of dry, technical points to a discipline that arouses our sense of appreciation of the wisdom and perfection in our world. As such, this article could serve as a link between the general principles of Islamization of knowledge on one hand and the teaching approaches of science on the other hand. Similar efforts of Christian scientists are also surveyed. At last, recommendations for building a conducive environment for an Islamic-friendly presentation of science are given.

Keywords: Islamization of Science, Secular Education, Islamic Worldview, Science Pedagogy, Faith-Based Teaching.

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1. Scope and Objectives of Islamization of Science

Knowledge is a reflection of the values of its generators. When Muslims were pioneers in knowledge creation, their knowledge naturally embodied Islamic values. However, when colonization controlled Muslim countries and impeded the inculcation of Islamic values in new branches of knowledge, the need for Islamization of knowledge appeared. Islamization of science in particular is critically important as a result of their economic impact and their prevailing influence on our lifestyle. Nonetheless it is instructive to clarify exactly what is meant by Islamization of science to gather momentum for this vital initiative and to avoid groundless criticism of it.

Following the Ghazalian style,[2] Islamization of science education involves two major tasks, namely removing the anti-Islamic elements from science, and infusing Islamic values into science. The second task should enable a synergy between science curricula and Islamic studies curricula. An obvious example of an anti-Islamic element is a statement like 'the configuration of an organism is the result of the way nature evolved over billions of years.' Denial of divine acts should be eliminated from science. Furthermore, science should not be reduced to mere material views. Islamic perspectives should augment the empirical presentation. For example, it is not sufficient to physically characterize the spine anatomically and physiologically, such a description should be used to foster our servitude to God and to mandate ethical and responsible utilization of our abilities. The elements of the Islamization of science will be outlined in more details in Table 1, which follows the discussion of the ten principles to be established in science education. The synergy between science and Islamic studies will be discussed in *The Way Forward* section.

To avoid any misunderstanding regarding the intent of the Islamization of science education, it is instructive to state the aspects to be maintained in science education as follows:

[2] Al-Ghazālī (d. 1111) often used the terms *takhliyyah* and *taḥliyyah* to refer to the process of removing undesirable traits and cultivating virtuous ones.

1.1. The economic dimension of science investigation should be maintained. Islamic economy does not restrict technology development for commercial purposes. As such, governmental agencies, and public and private companies are entitled to develop scientific solutions for profit. The Islamic education of science does not aim at confining science to mere philosophical discussions.

1.2. Experimentation is an essential means for verifying hypotheses and exploring new dimensions. Observation and confirmation are deep-rooted in the Islamic thought and practice of Muslim scientists. Nonetheless, it should be realized that controlled experiments, where independent variables are accessible, are limited to a narrow domain of cases.[3]

1.3. The quantitative character of science is desirable. Mathematics is the language of science. Accurate measurements and quantitative modelling are vital tools for delivering concrete results. However, fuzziness is unavoidable in many applications, for which fuzzy logic has been devised.[4] Additionally, qualitative reasoning is also needed for an adequate characterization of many scenarios.[5]

2. Stages of Secularizing Science

During the golden era of Islamic civilization, science used to be practiced under the blessing of religious figures. Scientists, such as Jabir ibn Hayyan (d. 813), Father of Chemistry, al-Zahrawi (d. 1013), Father of Surgery, and al-Jazari (d. 1206), Father of Mechanical Engineering, were motivated by their Islamic sentiment to break new

[3] See "16 Advantages and Disadvantages of Experimental Research," *Vittana*, accessed July 18, 2024, https://vittana.org/16-advantages-and-disadvantages-of-experimental-research

[4] S. Sivanandam, S. Deepa, and S. Sumathi, *Introduction to Fuzzy Logic using MATLAB* (Berlin: Springer-Verlag, 2007).

[5] S. Tracy, *Qualitative Research Methods*, 2nd Ed. (New Jersey: Wiley Blackwell, 2019).

grounds and elevate their societies.[6] Unfortunately, this love-based marriage between science and Islam was terminated when the torch of civilization moved to Europe during renaissance. European scientists had a very different experience with the church. Scientific discoveries were rejected based on the views of religious authorities. Even worse, scientists, like Galileo (d. 1642), were persecuted and forced to retract their findings. Others like Copernicus (d. 1543) concealed their writings in anticipation of the reaction of the church.[7] Accordingly scientific advancement and economic development had to be sought away from religion in the western world, which paved the way to secularism.

Secularism brought dramatic changes to the relationship between science and religion that reshaped the culture in both of western and Muslim societies. At present, it is considered inappropriate to mention 'God' in scientific works. This sweeping change has take a few centuries, until we reached the point of open animosity of science to religion. The important milestones of the path of secularizing science are summarized below:

2.1. The attempt of the church officers to thwart scientific investigations that did not comply with their views triggered the clash between science and religion. In 1551, the Pope declared that "People should not just follow reason, but should confirm their opinions with the Holy Scripture, traditions of the Apostles, and sacred and approved Councils."[8] In response to the Pope's statement, following the Holy Scripture would not be a problem. The problem lied in giving a definite, undebatable authority to the views of the church officers that the Pope referred to as approved

[6] G. Sarton, *Introduction to the History of Science* (Baltimore: The Williams and Wilkins Company, 1931).

[7] See "Copernicus, Galileo, and the Church: Science in a Religious World," *Inquiries Journal*, accessed July 18, 2024, http://www.inquiriesjournal.com/articles/1675/copernicus-galileo-and-the-church-science-in-a-religious-world

[8] M. Allaby, and D. Gjertsen, *Makers of Science-1* (New York: Oxford University Press, 2002), 18.

Councils, based on which scientific findings were discredited.

2.2. August Comte (d. 1857) claimed that the only valid knowledge is the one gained through observation and experimentation.[9] For some reason, this claim was termed as Positivism. With Positivism, the domain of valid knowledge was confined to the limits of our senses, and even tighter to that can be confirmed by experimentation. Positivism automatically marginalizes human sciences. Following Positivism, various social sciences with long legacy would fail to qualify as science.[10] Furthermore, the study of complex systems, which are hard to test, would face the same difficulty. The predominant experimental trend of Positivism diminishes the role of rational faculties, or at least gives it less attention.

2.3. Not only did Positivism limit knowledge, but it also degraded religion in favor of science. Comte claimed that in the early stage of human history, people had a lot of unanswered questions about the world, and in particular about how natural phenomena occur. Religion, according to Comte, was used to fill the gap by attributing these phenomena to God. However, as science advances, it will be able to answer such questions, which directly eliminates the need for religion. Apparently, Comte had a major misunderstanding about the purpose of religion. He assumed that religion should explain natural phenomena!

2.4. Then, Darwin (d. 1882) introduced evolution as a mechanism to replace creation. Evolution relied on autonomous mechanisms, such as mutation and the survival of the fittest, that do not need an external supervisor.[11] According to evolutionists, the current status of the species is the result of the work done by nature over billions of

[9] Auguste Comte, *A General View of Positivism* (London: Trubner and Co., Paternoster, 1865).

[10] H. Kincaid, *Philosophical Foundations of the Social Sciences, Analyzing Controversies in Social Research* (Cambridge: Cambridge University Press, 1996).

[11] Charles Darwin, *The Origin of Species* (New York: P. F. Collier & Son, 1909).

years. In the last phase of this work by nature, apes evolved to those spices called men. Rather than thinking of ourselves as dignified creatures, to whom angels were ordered to bow, we are considered the successors of monkeys in the context of evolution. Darwinism paved the way for atheism by pushing creationism into the realm of old-time fictions.

2.5. Marx (d. 1883) proposed that human history is shaped based on the material needs of people. He assumed that there are continuous struggles in the society, such as the struggle between workers and business owners, that shape the way events progress. Under materialism, noble qualities and ethical norms are no longer influential factors in real life. Materialism also conflicts with long standing and widely accepted notions. Among others, people tend to accept that some leaders are endowed with exceptional qualities that prepared them for outstanding achievements. However, materialists think that such heroes are the outcomes of the burning pressure of the circumstances. In short, materialism strips man of his distinctive merits and reduces him to a thinking mammal.

2.6. Then, Russell (d. 1970) introduced the theory of Definite Descriptions, which aims at removing ambiguous references from scientific theories.[12] The theory states that predicates, or the descriptions of entities in a theory, must correspond to concrete and empirically defined entities in the external world. The theory, hence, serves as a further step to tighten the grip of empiricism on the structure of scientific theories.

2.7. Vienna Circle[13] has undertaken the task of secularizing science in education. The circle members rejected metaphysical arguments. Such arguments are not limited to the World of the Unseen, such as heavens and angels. Metaphysical arguments extend to abstract entities like wisdom and beauty. Accordingly, metaphysical arguments have been declared unscientific and should thus be removed

[12] : Bertrand Russell, "On Denoting," *Mind* 14, no. 4 (October 1905): 479–493.

[13] A group of philosophers and scientists who used to meet in the years of 1924-1936 to discuss issues of the philosophy of science.

from the vocabulary of science. After the Second World War, some members of the Circle moved to USA. There, they implemented their views in universities and communities of applied research. Vienna Circle managed to bring secularism to Western universities. Nowadays, college students have to follow the restrictive framework laid out by the Circle in order to be considered real scientists!

2.8. Finally, union emerged between Comte's Positivism and Russell theory of Definite Descriptions, giving rise to Logical Positivism.[14] Logical Positivism considers the abstract arguments, namely metaphysical, spiritual, and ethical arguments, unscientific because they lack the empirical character and do not refer to cognitively concrete entities. After removing these three abstract components of science, the leftover is merely measurements and lab experiments. An Islamic renaissance is needed to restore the rational and insightful character of science and bring mind back atop of its kingdom.

3. Glimpses at the Islamization of Knowledge Project

In the second half of the twentieth century, the colonial armed forces left Muslim countries. The next logical step was to free Muslim minds from the intellectual impact of colonialism. In 1977, prominent Muslim thinkers gathered in Makkah through the *First World Conference on Muslim Education* to discuss ways for dealing with the increasingly invasive secular impact on Muslim education.[15] In this conference, Ismail al-Faruqi and Syed Muhammad Naquib al-Attas played a pivotal role in formulating the concept of Islamization of Knowledge (IOK), which aims at aligning all fields of knowledge, including science, with the principles and values of Islam.

In his seminal work in 1982 entitled "*Islamization of Knowledge: General Principles and Work Plan*," al-Faruqi addressed

[14] The term "Logical" refers to Russell's proposal that the conclusions of scientific theories should conform to the structure of mathematical logic.

[15] S. Ashraf, *Islamic Education Movement, An Historical Analysis, 1977-1990* (Kuala Lumpur: Muslim World Research Center, 2017).

the divide between religious and secular education systems. This divide "severs the connection between Muslims and their heritage, hindering their enthusiasm for creative expressions of Islam."[16] Al-Faruqi highlighted that public funds are made available only under the terms of secularization, which resulted in two bifurcating systems, one Islamic and one secular.[17] Al-Faruqi called for a comprehensive overhaul of the education system for a genuine revival of the Ummah.[18]

In his seminal work in 1978 entitled "*Islam and Secularism*," al-Attas stated that the "Holy Qur'an is God's invitation to a spiritual banquet on earth, and we are exhorted to partake of it by means of acquiring real knowledge of it."[19] Accordingly, the Qur'ān is the real and true source of knowledge, to which all other branches of knowledge must comply. Al-Attas further stated that "Education is the instilling and inculcation of *adab*[20] in man,"[21] where *adab* encompasses the spiritual and material life of man, and instils the quality of goodness in him/her.[22] Through instilling *adab* in man during the educational process, a good man that brings justice[23] to himself and to the society is produced.

In his seminal work entitled "*Tawhid and Science: Islamic Perspectives on Religion and Science*," Osman Bakar "seeks to reveal different dimensions of the organic link that exists between al-

[16] J. Khowaja "Ismail Raji Al-Faruqi's Islamization of Knowledge: A Critical Analysis," *Islam Perceptions and Perspectives* (2024): 3.

[17] Ismail al-Faruqi, *Islamization of Knowledge: General Principles and Work Plan* (Herndon: International Institute of Islamic Thought, 1989), 6.

[18] J. Khowaja "Ismail Raji Al-Faruqi's Islamization of Knowledge: A Critical Analysis," 3.

[19] Syed Naquib Al-Attas, *Islam and Secularism* (Kuala Lumpur: International Institute of Islamic Thought and Civilization, 1993), 150.

[20] Al-Attas emphasized that *adab* is the only appropriate and adequate term that pertains to education. According to him, it is a mistake to use the term *tarbiyyah*, or upbringing, in relation to education because of its physical connotations and universal application to man and animals alike. See S. Al-Attas, *Islam and Secularism*, 151-152.

[21] al-Attas, *Islam and Secularism*, 152.

[22] Ibid., 151.

[23] See how Al-Attas defined justice in al-Attas, *Islam and Secularism*, 149.

tawhid and science as seen through Muslim scientific eyes."[24] Bakar also discusses the shared features between Islamic science and modern science "such as the rational and logical nature of its language, the adoption of scientific and experimental methods of inquiry, and the international character of its scientific practice and organization."[25] Chapter 4 about "*The Unity of Science and Spiritual Knowledge: The Islamic Experience*" discusses the Tawhidic perspective of science which knows God through nature and knows nature through God.[26] This perspective stands in contrast to the spirit of reductionism which characterizes modern science.

The above works and many others[27] laid out the theory and principles of the IOK project. An important component of the *work plan* of this project is to produce science curricula for school students that implement these principles. This was the initiative taken by Kamal Hassan and his team. In *Natural Science from the Worldview of the Quran: An Introduction,* the Quranic worldview of the study of natural sciences is laid, alongside the fundamental concepts of biology and physics. Even though it is declared by the authors that the book is intended for high school students, a considerable amount of work is still needed before the book can be actually used for this purpose. However, the book can be used by high school science teachers for supplying a complementary Islamic background to be conveyed in class instruction. To better understand the educational contribution of the book, a limited survey on selected physics topics was conducted. This analysis highlights how the integration of Qur'anic worldview and scientific concepts was operationalized. Based on this review, the following Islamic elements were identified in the curriculum design:

3.1. Attributing the favors of God to Him, such as the provision

[24] Osman Bakar, *Tawhid and Science, Islamic Perspectives on Religion and Science, Second Edition* (Kuala Lumpur: ARAH Publications, 2008), ix.
[25] Ibid.
[26] Ibid., 61-76.
[27] The list of works discussed in this section is not meant to be comprehensive or inclusive by any means. The author acknowledges the fact there are other significant works that are not included in this list.

of energy through the sun,[28] and the use of the energy of wind in sailing ships.[29]

3.2. Giving practical examples of the impact of divine favors on our daily life, such as the conversion of the sun's energy to other forms and using them in powering modern transportation.[30]

3.3. Linking the laws of physics that form the physical order in the world to divine actions, (*tadbīr Allāh al-kawnī*), such as the dispersal of energy as measured by the entropy.[31]

3.4. Giving Islamic guidelines for protecting the environment and reducing energy consumption.[32]

Muslim scholars were not the only ones concerned about the secular orientation of contemporary science works. A group of Christian scientists and scholars in the USA have done a substantial amount of work in refuting evolution. They coined the term 'Intelligent Design' in reference to the diligent and complex functions of living organisms that would inevitably need a Designer.[33] However, this group was not labelled as creationists because they did not explicitly specify the identity of the Designer.[34] Michael Behe, an American molecular biologist, is the leading scientific spokesperson for Intelligent Design. In *Darwin's Black Box*, Behe presented three irreducibly complex organisms whose diverse functions must exist at the same time in order for these organisms to survive.[35] The notion of 'irreducible complexity' is

[28] Muhammad Kamal Hassan, *Natural Science from the World View of the Qur'ān*, vol. 2 (Kuala Lumpur: Institut Terjemahan & Buku Malaysia, 2018), 104.
[29] Ibid., 113.
[30] Ibid., 105.
[31] Ibid., 447-448.
[32] Ibid., 107.
[33] This term was used in P. Davis, D. Kenyon, and C. Thaxton, *Of Pandas and People: The Central Question of Biological Origins* (Dallas: Haughton Pub. Co., 1993).
[34] Even though some people assume it is straightforward to understand that references to "God" in such discussions pertain to the Christian conception, the underlying theological implications are often left unexplored.
[35] Michael Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution*

antagonistic to the notion of gradual development of organisms as proposed by evolutionists. Also, Phillip Johnson, a Law Professor, has done rigorous analysis of evolution that showed the flaws and logical inconsistency of its concepts and mechanisms.[36]

In 2004, the Kitzmiller Dover School District Board required presentation of the concept of Intelligent Design in ninth grade biology classes, alongside evolution. However, a group of student parents sued the board challenging the constitutional validity of the Board policy. In 2005, Judge John Jones ruled against the Board and barred any reference of Intelligent Design in science classes, on account of violating the constitution of Pennsylvania. In the 'findings of facts', Judge Jones stated that Intelligent Design is of religious nature, or 'religion in disguise'. He further stated that Intelligent Design violates a centuries-long legacy of scientific investigation.[37] It is worth mentioning that Judge Jones simply reiterated the stands of Positivists. The verdict was criticized as it resorted to censorship and imposition of a single direction, instead of recommending open discussions and presentation of evidence. Ironically, the Pa. Court decision in the twenty first century is no different from the church decision to persecute scientists in the sixteenth century.

4. Ten Principles to be Established in Science Education

Islamization of science education goes through two phases: establishing the principles and the conceptual framework and then implementing these principles according to the prescribed framework. Through excellent and insightful research by many prominent Muslim thinkers, the first phase has been completed successfully. As far as the implementation phase is concerned, there is still considerable work to be done. According to al-Faruqi, there are important methodological principles of Islam, which include the unity of truth, the unity of knowledge, the deliberate nature of creation, and the relationship of servitude between creation and

(New York: Free Press, 1996).

[36] P. Jonhson, *Darwin on Trial* (Washington, D.C.: Regnery Gateway, 1991).

[37] "Kitzmiller v. Dover Area School District," *Wikipedia*, accessed May 18, 2024, https://en.wikipedia.org/wiki/Kitzmiller_v._Dover_Area_School_District.

humanity, and between humanity and Allah (ﷻ).[38] These principles must be incorporated into the body of modern science by removing, revising, reinterpreting, and adjusting its elements in accordance with the Islamic worldview.[39] Al-Faruqi listed seven areas to work on towards achieving the above aim, including mastery of modern science and mastery of Islamic legacy.[40] Apparently, the scarce of personnel who concurrently master these two fields[41] and the lack of productive dialogues between religious scholars and scientists hindered the advancement of the implementation phase. As a humble step towards implementing the Islamization of science education, this article pinpoints ten aspects to be mended in science education in general, and in applied sciences education in particular. These ten aspects collectively form a conducive framework for science to achieve its utilitarian purpose and to fit harmoniously into the Islamic legacy. Each of these aspects is discussed below, starting with the Islamic principle to be considered and followed with practical case studies.

First principle: The hierarchy of human knowledge consists of various layers, on top of which come revelation-based concepts. Applied sciences occupy lower layers in accordance with their credibility and authenticity. This principle is a direct result of recognizing the source of each type of knowledge. Divine statements – when expressed in a definitive manner – are not subject to error, since their originator is the creator of the universe. On the other hand, applied sciences are the outcomes of the ongoing human endeavor with the cosmos. They endure successive stages of authenticity, accuracy, and comprehension. In fact, according to Popper, such sciences can never be certain.[42] Even though I have some reservations on Popper's view,[43] it nonetheless points out the

[38] al-Faruqi, *Islamization of Knowledge: General Principles and Work Plan*, 20.
[39] Ibid., 18.
[40] Ibid., 59-79.
[41] It should be noted that al-Faruqi was among the rare scholars who mastered both domains; he held a PhD in Western philosophy as well as a PhD in Islamic studies from al-Azhar University.
[42] Karl Popper, *The Logic of Scientific Discovery* (London: Routledge Classics, 2007), 17-20.
[43] Ahmed Hassan Mabrouk "*Towards a Scientific Approach for Integrating*

doubtful nature of applied sciences. As a result, when divine statements explicitly state a point, scientific research should not attempt to prove the opposite.

Case Study 1: God says: "They ask you O Prophet about the spirit. Say, its nature is known only to my Lord," *al-Isrā'*, 85, stating that the soul is beyond the domain of human knowledge. Islamic theology regards soul as a non-physical matter that inhibits the human body while alive and is taken out by the angel of death when the respective human dies. As God says: "Say, O Prophet, your soul will be taken by the Angel of Death, who is in charge of you. Then to your Lord you will all be returned," *Sūrah al-Sajdah*, 11. Accordingly, research that is solely dedicated to reviving dead bodies, as well as medical procedures of freezing dead bodies in anticipation of medical doctors being able to bring them back to life are both against Islamic teaching.

Case study 2: God says: "Indeed, We created humans in the best form," *Sūrah al-Tīn*, 4, stating that the human functions and configuration are in their best possible status. Physical human characteristics are coded into the human genes. The International Islamic Fiqh Academy resolved that "If genetic treatment is sought for the mere sake of acquiring specific characteristics such as shape alteration, it becomes prohibited because it involves the prohibited act of changing the original form of Allah (ﷻ) creation."[44] Accordingly, genetic research aiming at changing inherent human characteristics of healthy people[45] should cease.

It is important to note that the statements of Islamic revelation about cosmic-based issues have been focused on demonstrating the divine perfection and mercy of creatures. Only in limited and specific issues did Islamic revelation state science-related facts, such as those in the above two case studies. For this reason, Islamic history never

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Science's Outputs and Islamic Concepts – Part 1," TAFHIM: IKIM Journal of Islam and the Contemporary World 16 No. 1 (June 2023): 17-19.

[44] International Islamic Fiqh Academy, *Resolutions and Recommendations of the International Islamic Fiqh Academy*, 3rd ed. (Jeddah: www.iifa-aifi.org, 2024), Resolution no. 203, 496.

[45] Apparently, treating malfunctioning gene that causes disability or ailment should be allowed. Similarly, devising defensive measures against military genetic weapons should be pursued.

witnessed persecution of scientists by a religious authority similar to those inflicted on the western scientists by the church during the renaissance era. On the contrary, Muslim scientists have been motivated by their religious attitude to explore the universe and uncover its secrets.[46]

Second principle: Divine acts are to be solely attributed to God. One of the integral components of monotheism, *tawhid*, is that no other gods are to be associated with God. The Qur'ān expounds this principle in many places. For example, the verses of *Sūrah al-Naml*, 60-64, bring to our attention the creation of heavens and earth, the landscape formation on earth, replying to the distress, and guiding people on land and sea. In particular, verse 61 asks, "Who made the earth a place of settlement, caused rivers to flow through it, placed firm mountains upon it, and set a barrier between fresh and salt bodies of water? Was it another god besides Allah SWT? Absolutely not!" Furthermore, in *Sūrah al-Wāqi'ah*, 63-74, God reminds people of His favors in their livelihood, such as the growing plants, the drinking water, and the fire we kindle.

Case study: Many science books refer to nature as a creator with free will and executive power. It is common to find statements like, "Landform was formed naturally …" and "What we see now is the outcome of work done by nature over several billions of years." Instead of referring to a vague and nonconcrete entity like nature, God is to be acknowledged!

*Third principle***:** Both deterministic processes as well as stochastic processes are fully known to God beforehand and governed by His will. Deterministic processes follow predictable formulae with regard to all components involved. For example, it is known at which temperature water boils. Likewise, the acceleration of a ball that is kicked by a known force can be determined in advance. On the other hand, the agents of a stochastic process follow a probabilistic framework. For example, which sperm is going to fertilize the egg, which virus is going to lead to sickness, and which seed is going to split and produce the seedling are all stochastic processes. We can only characterize such processes with likelihood

[46] al-Qur'ān, 29:19-20.

figures. Stochastic processes demonstrate the divine will in enabling some agents and prohibiting others. In *Sūrah al-An'ām*, 59, God says, "Not even a leaf falls without His knowledge, nor a grain in the darkness of the earth or anything—green or dry—but is written in a perfect Record." As the verse names various stochastic processes, it shows that all the events of such processes are fully known in advance to God and controlled by His will.

Case study: Weather conditions, including rainfall, follow a stochastic process in our human sense. However, it is fully documented in the decree of when and where every drop of water is going to fall on earth. Alongside meteorological analysis for rainfall prediction, scientists should realize that all weather conditions, including precipitation, are fully controlled by God. Interestingly, Muslims pray for rainfall, *ṣalat al-istisqa'*, based on this belief.

It is worth noting that randomness, as shown in stochastic processes, has been used by the Western scientific community as a tool to obscure the divine acts. Darwin resorted to the random mutations of cells to claim the emergence of spices with new characteristics.[47] The same concept was generalized to the formation of galaxies and our solar system for the purpose of denying the creation of heavens and earth as depicted in Qur'an and other holy books.[48] In *The Society of Mind*, D. Minsky attempted to show that the functions of a central processor can be equivalently conducted by small agents, each of which is unaware of the other agents. In other words, Minsky tried to show that the central leader can be replaced by small, distributed agents, and the self-conscious supervisor can be replaced by unconscious micro agents.[49]

In the past few decades, the above concept was imported to the field of machine learning and utilized to portray neural networks as self-learning systems, even though the mechanism of updating the parameters of neural networks is neither learning nor autonomous.[50]

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[47] Harun Yahya, *Darwinism Refuted* (New Delhi: Goodword Books Pvt. Ltd., 2002), 27-30.

[48] Osman Bakar, *Quranic Pictures of the Universe, The Scriptural Foundation of Islamic Cosmology* (Gadong: UDB Press, 2016).

[49] M. Minsky, *The Society of Mind* (New York: Simon and Schuster, 1986).

[50] "Overview of Neural Network's Learning Process," *Medium*, accessed August 3,

Apparently, randomness is being used as a mental trap for confusing the intellect and obscuring divine acts under the hood of micro, self-adapting agents.

Fourth principle: Scientific theories should not be crafted in accordance with a preset assumption. Rather, they should be based on verified hypotheses. As God said, "Do not follow what you have no sure knowledge of. Indeed, all will be called to account for their hearing, sight, and intellect," *Sūrah al-Isrā'*: 36. When significant pieces of information are lacking and, as a result, some conclusions are made based on best guess, this should be highlighted, in order to distinguish evidence-based points from guess-based claims. Scientific theories are not the right place for triggering imagination to guess missing links when tangible facts are scarce.

Case study 1: Anthropologists portray first man and early communities on earth as primitive, undeveloped creatures whose behavior and manners were close to animals. As a matter of fact, the father of men, Adam, peace be upon him, was a Prophet with intelligence and good social manners. Furthermore, as far as social sciences that shape morals and behavior are concerned, the depth and insight of these sciences were higher in early generations than later ones. Regarding the Muslim *Ummah* in particular, our Prophet indicated that as time goes by Muslim generations will not be as good as early generations. He said, "The best generation is mine, then the one after, then the one after."[51] Our Prophet named some of the signs of the Last Day as, "Work decreases, stinginess becomes rampant, and killings increase."[52]

Once again, the picture of less developed early humans is aligned to the vision of evolution, which assumes that organisms improve gradually as they interact with the surrounding environment. The Qur'ān, however, presents a totally different picture. The first man was created in the best fashion, knowledgeable of his Creator, able to communicate, and capable of recognizing, naming, and

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2024, https://medium.com/data-science-365/overview-of-a-neural-networks-learning-process-61690a502fa

[51] al-Bukhari, *Ṣaḥīh al-Bukhari* (Damascus: Dar Ibn Katheer, 2002), The Book of Testimony, Ḥadīth number 2651.

[52] Ibid., Ḥadīth number 6037.

classifying things. In line with this Qur'anic picture, recent archaeological findings suggest a considerable level of sophistication in selecting material and building specific tools by Paleolithic (Old Stone Age) humans, who have been regarded as primitive species relying on hunting and fishing for livelihood.[53]

Case study 2: Theories of cosmology that address the temporal formation of the universe have been established after the fact. They lack observability of the actual events as they unfold over time. As God says, "I never called them to witness the creation of the heavens and the earth or even their own creation, nor would I take the misleaders as helpers," *Sūrah al-Kahf*, 51. The big bang, the formation of galaxies, and the composition of the layers of earth could have happened in totally different ways than those described in cosmology literature. When the observed facts do not stand alone to establish credible theories, it is just fair to acknowledge that the relevant theories are guess-based. For brevity, it suffices to mention that the meaning of the big bang as an ultimate beginning to all types of existence is no longer accepted among cosmologists.[54]

As ideology and culture have a strong influence on scientists, it is common to have bias towards unislamic tendencies among western scientists. Hence, it is the role of Muslim scientists to critically assess the above theories of anthropology and cosmology for the sake of producing fact-based views about the early history of man on earth and the creation of the universe respectively.

Fifth principle: Many of the natural systems are facilitated for the benefit of mankind. For example, the cycle of day and night, the rainfall and plantation, metals and fuels buried into the earth, cattle and domesticated animals, and forests and oceans are all given to people for free. In fact, most of the economic activities capitalize on natural resources, without which no economic growth could have been realized. God says, "He also subjected for you whatever is in

[53]See "Stone Tool Discovery Challenges Entire Theory of Early Human Intelligence and Evolution," *Earth.com*, accessed February 21, 2025, https://www.earth.com/news/stone-tool-flint-discovery-challenges-theory-of-human-cultural-evolution/.

[54]"The Big Bang No Longer Means What It Used To," *Big Think*, accessed February 21, 2025, https://bigthink.com/starts-with-a-bang/big-bang-meaning/?utm_source=mailchimp&utm_medium=email&utm_campaign=weeklynewsletter.

the heavens and whatever is on the earth—all by His grace," *Sūrah al-Jāthiyah*: 13. In addition, man is privileged over many creatures. For example, cognitive and reasoning abilities, innovation and imagination, and mercy and compassion are all differential advantages to humans. God says, "Indeed, We have dignified the children of Adam, carried them on land and sea, granted them good and lawful provisions, and privileged them far above many of Our creatures," *Sūrah al-Isrā'*: 70. All these gifts should be acknowledged verbally and in action. Instead of thanking nature for its continuous work over 13.7 billion years, we should thank God for His continuous nurture since the inception of the universe.

Case study 1: Anatomical and physiological properties of animals are amazing demonstrations of how suitable and adaptable these animals are to the purpose of their creation and to their environment respectively. The anatomies of the knee joint and the shoulder plate enable a wide range of movements, which contribute directly to the diverse and complex tasks conducted by legs and arms.[55] Lions are given sharp canines to eat meat, which is the main ingredient of their diet. Likewise, deer and cows are given incisors to cut plants, and fish are given gills to survive in water. Examples of this sort are countless. All these forms of adaptation are direct application of the Quranic verse, "Our Lord is the One Who has given everything its distinctive form, then guided it," *Sūrah Ṭāhā*: 50.

Case study 2: Behavior of animals can be classified into learned and instinctive behavior. Examples of instinctive behavior are the turtles' burial of their eggs under sand, the sucking of milk by newborns from their mothers, and the migration of whales from cold to warm regions.[56] These instinctive behaviors have been ingrained by God into respective animals to save their lives and maintain their livelihood. Secular thinkers describe the behavior but disable the

[55] See "Shoulder," *PhysioPedia*, accessed August 18, 2024, https://www.physio-pedia.com/Shoulder.

[56] "Instinct vs Learned Behaviour," *Animal Behavior Corner*, accessed August 18, 2024, https://animalbehaviorcorner.com/instinct-vs-learned-behavior-unveiling-natures-blueprint/

causality law to inhibit the attribution of these bounties to their Originator.

Sixth principle: Human knowledge is severely limited.[57] We learn about the world through our senses with the support of auxiliary instruments such as telescopes and microscopes. Since the universe dimensions far exceed billions of light years, and light is the fastest speed that an object can travel with, the part of the universe that is within our observation is extremely tiny. On the other hand, there are so many micro creatures beyond our detection. For example, viruses can only be probed with electron microscopes, which show limited aspects of the object under observation. Particularly important, the subatomic particles and their quantized energy levels are beyond direct observation, which resulted in conflicting interpretations of the experimental results of Quantum Physics and inconsistent views of their implications.[58] Beside the creatures we are aware of, there may be other creatures around us or in different parts of the universe, but beyond the scope of our senses. For example, we know that we cannot see angels in their original forms; they have to take the form of humans to enable communication with Prophets. All the above limitations of human sensation and perception are summed up in the Quranic verse that simply states the divine reminder, "And you O humanity have been given but little knowledge," *Sūrah al-Isrā'*: 85. Such a realization of knowledge limitation motivates people to be humble and cautious of falling in error. A deeply rooted practice among Muslim scholars is the humble admission, "I do not know," grounded in the conviction that acknowledging one's limits is itself a form of knowledge—indeed, that half of knowledge lies in the ability to say so..[59] As God said, "We elevate in rank whoever We will. But above those ranking in knowledge is the One All-Knowing," *Sūrah Yūsuf*: 76. In

[57] J. Vazhayil, *Limits and Limitations of the Human Mind* (Bangalore: Vikas Publishing House Pvt. Ltd., 1996).

[58] Ahmed Hassan Mabrouk "Quantum Physics and the Boundaries of Human Perception," *TAFHIM: IKIM Journal of Islam and the Contemporary World*, Vol. 13, No. 1 (June 2020): 23–55.

[59] M. ʿAwāmah, Adab al-Ikhtilāf fī Masāʾil al-ʿIlm wa al-Dīn (The Manners of Differences in the Issues of Knowledge and Religion) (Beirut: Dār al-Bashāʾir al-Islāmiyyah, 1997), 172–174.

consideration of our limited knowledge of ourselves and the universe, it makes sense to accept revelation as the setter of the principles governing our knowledge.

Case study: Numerous phenomena in all fields of natural sciences are partially explained. For example, the methods of coding, processing, and retrieving information into and from our brains are far from being understood. Similarly, the chemistry of sleep and its peculiar case of hibernation are still beyond comprehension. During hibernation, breath rate, heartbeats, and body temperature are all reduced to enable the survival of the animal with the lowest amount of energy. The hibernating animal is released from searching for food in unfavorable environmental conditions. Such unexplained phenomena should arouse the sense of gratitude to the divine nurture, which takes place through processes that are totally beyond our control, and even perplexing to our intelligence.

Seventh principle: The universe is not an isolated closed system. It is worth noting that, the universe has gateways for bidirectional connections between our world and the world of the unseen, *ʿĀlam al-Ghayb*. Angels come down to earth for several reasons, the most famous of which is the descent of the Angel Jabril for conveying Holy Scriptures to Prophets.[60] Human souls are sent to earth to be breathed into their embryos.[61] In the journey of our Prophet to the Heavens accompanied by Jabril, the latter knocked the gates of the seven heavens, one after the other, until they reached the seventh heaven.[62] The carriers of the Throne seek forgiveness for the believers and ask their Lord to grant forgiveness to the repenting servants.[63] Devils are thrown by meteoroids when they attempt to listen to the news of the unknown.[64] There is also a limited communication between living people and the souls of the deceased ones through true visions. Our Prophet, (ﷺ), is informed every time

[60] al-Bukhari, *Saḥih al-Bukhari, the Book of the Commencement of Revelation*, Ḥadīth number 2-4.
[61] Ibid., Ḥadīth number 3208.
[62] Ibid., Ḥadīth number 3887.
[63] al-Qur'ān, 40: 7.
[64] Sūrat Aṣ-Ṣāffāt, 7–8, and the commentary on these verses in al-Ṭabarī, *Tafsīr al-Ṭabarī* (Beirut: Muʾassasat al-Risālah, 1994), 6:295–296.

someone sends his/her prayers to him.[65] God injects bursts of energy into the universe, which contribute to its expansion.[66]

Case study: Scientists are intrigued by the question: "Are we alone in the universe?" They go alien hunters and try to detect extraterrestrial life. Scientists search for cosmic signals coming from the outer space, they examine the possibility of life, even in bacterial form, on planets of our solar system, and they look for bugs that breath hydrogen on the moons of Jupiter and Saturn.[67] When scientists look for aliens, they have to keep into consideration that forms of life in different parts of the world might be quite different from ours on earth. Thus, our fuzzy cognitive abilities should be employed such that we do not ignore evidence or clues we do not expect to encounter. As a direct application of this line of thinking, we have definitive evidence from the Qur'ān that there are six other skies above ours, in each of them God set its own order and creatures. God says, "So He formed the heaven into seven heavens in two Days, assigning to each its mandate,"[68] *Sūrah Fuṣṣilat*: 12. As scientists are busy looking for aliens and they try to contact them, they should also state the existence of six extraterrestrial worlds that hosts different families of angels, as well as other creatures only known to Allah (ﷻ), each with its distinct order and mandate.

Eighth principle: The cycle of human life should be framed in line with the Islamic vision of life and death. The stages of human life are depicted in science literature as a sequence starting with the embryo and ending with death. As a matter of fact, human life starts with breathing the soul into the embryo and concludes with entering

[65] "The Meaning of the Reply of the Prophet to Those Who Greet Him," *IslamOnline*, accessed September 1, 2024, https://fiqh.islamonline.net/%D9%85%D8%B9%D9%86%D9%89-%D8%B1%D8%AF-%D8%A7%D9%84%D9%86%D8%A8%D9%8A-%D8%A7%D9%84%D8%B3%D9%84%D8%A7%D9%85-%D8%B9%D9%84%D9%89-%D9%85%D9%86-%D8%B3%D9%84%D9%85-%D8%B9%D9%84%D9%8A%D9%87/.

[66] al-Qur'an, 51: 47.

[67] "Extraterrestrial Evidence: 10 Incredible Findings About Aliens from 2020," *Live Science*, accessed May 7, 2024, https://www.livescience.com/alien-discoveries-2020.html.

[68] The Organization of Islamic Research in Al-Azhar, *Al-Tafsīr al-Wasīṭ*, 3rd ed. (Cairo: Maṭbaʿat al-Muṣḥaf al-Sharīf, 1992), 8:686.

Paradise or Hill Fire. At the final stage when people experience everlasting happiness or misery,[69] "The earth will shine with the light of its Lord, the record of deeds will be laid open, the prophets and the witnesses will be brought forward—and judgment will be passed on all with fairness. None will be wronged," *Sūrah al-Zumar*, 69.

Case study 1: The Islamic holistic view of life has been captured by Muslim historians. When Imam Ibn Kathir compiled his famous book, "*Al-Bidāyah wa al-Nihāyah"*, which translates to '*The Beginning and The End'*, he did not present human history as a series of battles; he started his book with the creation of heavens and earth and then the creation of Adam,[70] Peace be upon him, and ended it with the scenes of the Day of Judgement and the description of Paradise and Hill Fire.[71] The work of this great scholar is a good example of blending history and theology in a cohesive framework.

Case Study 2: Life does not end as a result of mere tangible reasons, such as accidents or medical conditions. Life ends when the angel of death pulls the soul out of the body. The soul is an entity, not a symbol or a state. The overwhelming majority of Muslim scholars believe that soul is an actual entity that goes through the body as water goes through plants.[72] In *Jawharat al-Tawḥīd*, one of the most authentic compilations of the tenets of Islamic faith, Imam al-Laqqaani addressed this point in Paragraphs 88-89, which translate as follows:

It is compulsory on us to believe in death, where the soul is seized by the Messenger of death [Par. 88]; The assassinated person dies at the moment predestined by his Lord, any other (conflicting) view is unacceptable [Par. 89].[73]

Ninth principle: Natural catastrophes convey a divine message to people that they should cease oppression and abandon sins. Such calamities should drive people towards self-accounting and getting

[69] al-Qur'ān, 11: 105.
[70] Ibn Kathīr, *Al-Bidayah wa al-Nihayah* (Cairo: Hajr for publication and Distribution, 1997), V1.
[71] Ibid., V20.
[72] Al-Bajuri, *Hashiyat al-Bajuri ala Jawharit al-Tawhid* (Cairo: Dar al-Salam, 2002), 261.
[73] Ibid., 18.

closer to God. The Qur'ān says, "Why did they not humble themselves when We made them suffer? Instead, their hearts were hardened, and Satan made their misdeeds appealing to them," *Sūrah al-An'ām*: 43.

Case study: Earthquakes, floods, tornedos and the like have physical causes and divine wisdom. Physical causes can be sought in the sciences of Physics and Astronomy. The wisdom of sending natural catastrophes is to punish the disbelievers, to warn the deviants, and to examine the good servants. While it is Islamically recommended to seek physical explanations of natural calamities, and to devise ways for predicting their occurrences and alleviating their effects, such a physical view should not overshadow the wisdom behind these calamities. Early Muslims regarded natural calamities as divine warnings that should motivate people to repent and to scrutinize their behavior, as they render a chance to learn about their physical triggers.[74]

When an earthquake took place in Kufa, Iraq, the knowledgeable companion, Ibn Mas'ud (d. 32H) said, "Oh people, your Lord reprimands you, so do appease Him."[75] In other words, Ibn Mas'ud considered the quake a sign of the dissatisfaction of God with people. When another quake happened during the reign of 'Omar bin Abd Al-'Aziz (d. 101H), he instructed people to resort to prayers and to give away charity as an application of the Qur'anic verses,[76] "Successful indeed are those who purify themselves, remember the Name of their Lord, and pray," *Sūrah l-A'lā*: 14-15.

To sum up, natural calamities are part of the divine actions, which cannot be devoid of wisdom. This wisdom is either punishment or examination in accordance with who is inflicted with. Secular views hold tight on the physical causes while they ignore or deny the divine wisdom. Conversely, Muslims acknowledge both; they study the physical causes in natural sciences, and they reflect on

[74] "Earthquakes in the History of Muslims," *Al Jazeera*, accessed May 9, 2024, https://www.aljazeera.net/turath/longform/2024/4/23/تنبأ-فلكيو هم-بوقت-وقو عها-وأحصوا

[75] Ibn Kathīr, *Tafsīr Ibn Kathīr*, commentary on Sūrat al-Isrāʾ, verse 59 (Cairo: Muʾassasat Qurṭubah, 2000), 9:36.

[76] A. Ibn Abī Shaybah, *Muṣannaf Ibn Abī Shaybah*, ḥadīth no. 8550 (Riyadh: Dār Kunūz Ishbīliyā, 2015), 5:318.

the appropriate reaction to mend their relationship with God and to come to terms with hardships. Both facets of the phenomenon are important and worthy of pursuit.

Tenth principle: The aesthetic factor affects creatures and influences their behaviors. Not only are creatures meant to fulfil utilitarian purposes, but their beauty also delights our senses and calms our souls. The majestic mountains stabilize the earth, the beautiful flowers participate in pollination, and cattle render many services to us and please us at home and in fields. God says, "And He created the cattle for you as a source of warmth, food, and many other benefits. They are also pleasing to you when you bring them home and when you take them out to graze," *Sūrah al-Naḥl*: 5-6. It is also interesting to note that how rocky planets and blazing stars are positioned in the sky in such a way that we perceive them as a cheerful moon and twinkling lamps, respectively. As God says, "And We adorned the lowest heaven with stars like lamps for beauty and for protection. That is the design of the Almighty, All-Knowing," *Sūrah Fuṣṣilat*: 12.

Case study: The mechanisms proposed by evolutionists failed to account for the concept of beauty in creation. One stunning demonstration of the unconstrained divine power is how beauty emerges from unappealing predecessors. The ladybug – adorned with fantastic patterns– comes from the insect larvae.[77] The butterfly – proud of its vivid colors – comes from caterpillars, most of them are scary or at least unappealing.[78] This dramatic transformation upsets the fictitious scenarios of evolution. Beauty points to a Beautiful Creator[79] who has taken care of our needs, as well as our pleasure. Living in natural, refreshing places enhances our inner peace. It also makes us more protective to the environment, leading to a sustainable

[77] See "Ladybug Life Cycle," *Leafy Place*, accessed May 10, 2024, https://leafyplace.com/ladybug-larvae-and-eggs/.

[78] See "67 Types of Caterpillars with Identification Charts and Pictures," *Leafy Place*, accessed May 10, 2024, https://leafyplace.com/types-of-caterpillars/.

[79] Some Muslim scholars consider "Beautiful" (*al-Jamīl*) to be one of the names of Allah (I), based on the ḥadīth, "Allah is Beautiful and loves beauty," recorded in *Ṣaḥīḥ Muslim*, ḥadīth no. 147. However, this name is not included in the well-known ḥadīth enumerating the 99 names of Allah (ﷻ).

utilization of the natural resources, rather than economic exploitation.[80]

Table 1: Ten Key Aspects for Reforming Science Education Through an Islamic Framework

Islamic Principle	Case Studies	Secular Problem	Islamic View	Category of Islamization
Revelation-based Knowledge comes on top of the hierarchy of human knowledge	- Medical research aiming at reviving the dead is against Islamic teaching - Genetic alteration of human characteristics is against Islamic teaching	Medical practices conflict with religious stands	Divine guidance should govern scientific research	Removal of contradicting elements
Divine acts are to be solely attributed to God	Nature should not be posed as a doer instead of God	Denial of divine acts	God is the creator and the only executive power in the universe	*Tawhidic* implications to be asserted
Stochastic processes are known to and controlled by God	Weather conditions and associated micro events are documented in the *Tablet* before creating the universe	Reducing science to a tool for capturing material events	Random events demonstrate the divine Will	Reinstating the Islamic view of randomness
Scientific theories should be verified using credible proofs	- Anthropology portrays the first man as underdeveloped creature, in contrary to the Quranic view of his intelligence	Anthropology and cosmology theories of early history of man and universe are guess-based	Quranic pictures of our first parents and the early stages of the universe should be acknowledged	Reviewing guess-based views to assess their authenticity

[80] Osman Bakar, *Environmental Wisdom for Planet Earth: The Islamic Heritage* (Kuala Lumpur: Centre for Civilizational Dialogue, University of Malaya, 2007).

Islamic Principle	Case Studies	Secular Problem	Islamic View	Category of Islamization
	and good character - Scenarios describing the emergence of the cosmos are guess-based			
Natural systems in heavens and on earth are facilitated for the benefit of mankind, a fact worthy of gratitude	- Physiological properties of spices make them adaptable to their environment - Instinctive behaviors in animals are divine favors to maintain their livelihood	Divine favors on creatures are either ignored or attributed to nature	Natural systems are facilitated for man to enable him discharge his duties as a *Khalifa* on earth	Linking scientific facts to Islamic values
Human knowledge is limited in type and in details	Many unexplained phenomena work for our advantage	Relying on limited knowledge, that is subject to error, while denying the guidance of the all-Knowing	One reason for accepting revelation as a setter of our principles is in consideration of our limited knowledge; God maintains man via processes that he knows a little about	Developing the sense of servitude in man towards God
Our universe has gateways to *'alam al-ghayb*	As scientists consider the possibility of extraterrestrial life, they should also acknowledge the parts of the unseen world mentioned in the	*'Alam al-ghayb* is considered unscientific, in essence denied	Holy scripts provide an authentic source of knowledge, through which we learn about *'alam al-ghayb*	Restore the authentic sources of knowledge

Islamic Principle	Case Studies	Secular Problem	Islamic View	Category of Islamization
	Qur'an			
Human life starts with breathing the soul into the embryo and concludes with entering Paradise or Hill Fire	- Muslim historians conveyed a holistic view of the history of man - Death does not occur due to mere tangible reasons; it occurs when the angel of death takes the soul away	Exclude the unobservable events from the cycle of human life	Man is honored for breathing the soul into him; human endeavor concludes at the gates of Paradise or Hill Fire	Restore the purpose-driven aspect of human life
Natural calamities alert people to mend their relationship with God	The wisdom of earthquakes is either to punish the deviants or to examine the good servants	Only physical causes of natural calamities are considered, whereas the wisdom behind them is ignored	Muslims should reflect on how to get closer to God in response to natural calamities	Wisdom behind hardships is considered alongside their physical causes
Creatures are equipped with executive abilities as they are endowed with beauty	Beautiful creatures emerge from unappealing predecessors	Evolutionists did not account for beauty as an objective of creation	Concurrent fulfilment of our needs and pleasure is a form of divine nurture	Restore the aesthetic factor as an Influential factor beside the empirical properties

Upon reflecting on the last three columns of Table 1, it becomes clear that most of the problems caused by secularization stem from reducing science to bare empirical study that is totally detached from human values and purpose-driven analysis.

5. A Teaching Strategy for an Islamic Education of Science

Such a teaching strategy should be founded on a conceptual framework as well as practical training. The conceptual framework

encompasses the principles that science teachers should appreciate for a successful implementation of an Islamic education. These principles are as follows:

5.1. Science is not privileged with a superior position among fields of knowledge. As a matter of fact, it is *one* channel of human quest for knowledge, which comes next in credibility after revealed knowledge.

5.2. There is no real conflict between science and religion. This means that a divine statement would never indicate a point that may be proven wrong by trusted science.

5.3. If science explains the material causes of the events in the natural world, religion explains their philosophical meanings that pertain to the purpose of our existence. As such, science and religion should harmoniously complement each other.

Regarding practicing an Islamic education of science, the Islamic elements should be integrated into the Science Process Skills (SPS). SPS are widely accepted as essential skills for deep comprehension of science concepts by students. SPS consist of basic skills and integrated skills.[81] Basis skills include observation where information about the phenomenon under observation is gathered, and inference where conclusions are drawn about observations. The whole purpose of teaching is to move from familiar material to more complex or abstract material for the sake of interpreting happenings and capturing patterns. It is critically important that data analysis and inference are conducted with an objective, unbiased attitude.[82] Such an attitude is an adequate guarantee to eliminate any potential conflict between science and religion. A more detailed analysis of a teaching strategy for Islamic science education could be the topic of a future research.

[81] G. Gizaw and S. Sorsa "Improving Science Process Skills of Students: A Review of Literature," *Science Education International,* 34(3): 216-224.

[82] See "How to Develop Science Skills in Students," *Home Science Tools Learning Center*, accessed February 25, 2025, https://learning-center.homesciencetools.com/article/how-to-develop-science-skills-in-students/

6. The Way Forward

In order to create a conducive environment for the transformation to an Islamic education of science, the following prerequisites should be fulfilled:

6.1. Raise the awareness of the importance of applied sciences among Muslim youth, in recognition of their vital role in building strong economy, robust defense system, and high-quality communication, medical, and educational facilities. To create a large base of science enthusiasts, scientific material should be presented using non-technical language that can be comprehended by the public.[83] Science programs should be given a larger share in school curricula, public media, and governmental funding.

6.2. Synergize science curricula with Islamic studies curricula. Islamic study classes should present the Islamic stand of science-related issues. For example, the Quranic and Prophetic statements related to the creation of Adam, Peace be upon him, should be taught to prepare students for rejecting Darwinism. A one-to-one correspondence between the two disciplines can be realized by inserting *Connect-to-Islamic-Study* and *Connect-to-science* checkpoints in science and Islamic studies textbooks respectively. *Connect-to-Islamic-Studies* should refer students to the Islamic view of a science issue. Similarly, *Connect-to-science* should refer students to credible scientific views of a religious issue. Accordingly, social and ethical aspects of scientific issues can be adequately addressed. It is also a good mechanism for eliminating contradicting views between religion and science, which resulted in the dual Islamic-secular mindset that many Muslims suffer from.

6.3. Call upon Muslim scientists to revise and rewrite scientific theories that conflict with Islamic teachings. In particular, Muslim cosmologists have to scrutinize theories addressing

[83] A good example of simplifying science without sacrificing its accuracy can be found in S. Hawking, *A Brief History of Time* (New York: Bantam Books, 1996).

the inception of the universe for the purpose of distinguishing elements that rely on credible evidence from those relying on scanty evidence and been guessed by western scientists in line with their ideological orientation, as discussed in the fourth principle. A similar argument applies to Darwinism. It is direly needed to review the fossil records and to examine the logical consistency of the field observations of species in order to sort out inferences with scientific merits from artistically produced ones.

6.4. To form an international league that gathers a homogenous blend of scientists and religious scholars for the purpose of addressing the challenges of the Islamization of science education. This league should steer research toward addressing the areas of tension between science and religion. It should also provide consultation and resources for educational institutes undergoing the transformation from secular presentation of science to an Islamic one.

7.0 Conclusion

As the secular approach of teaching science is adopted, Muslim schools are effectively acting as factories for breeding secular minds. This article provides concrete guidelines to scholars and educators for transforming science education to the Islamic domain. Ten fundamental Islamic principles to be upheld in science education are discussed with references to their roots in Islamic teaching. Each principle is supplemented with relevant case studies. The discussion of the said principles and their associated case studies revealed the secular elements to be removed and the Islamic concepts to be established in their place, or alternatively the ailments to be treated and the cures to be used. Accordingly, the categories of Islamization in science education were identified. One ailment that repeatedly appeared in the secular approach is the axiom of evolving from primitive to advanced entities in favor of random interactions. This trend is not limited to the field of biology; it rather extended to anthropology, cosmology, and history. To give the Islamization of science initiative a better chance to succeed, a teaching strategy and few practical measures were recommended, most notably is the

synergy between science and Islamic study curricula. The overall aim of this article is to enhance the methodological clarity of the Islamization of Knowledge project.