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The Scientific View of the Holy Qur`an
نظرة العلمية في القرآن الكريم

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إبراهيم شوقار

Abstract: This article investigates the Qur'anic approach on knowledge inquiry which emphasizes both the rational and empirical methods. It presents the various techniques adopted by the holy Qur´ān to inculcate research interest and promote the scientific enterprise, such as inspiration and systemization of inquiry. Mankind needs to understand the world and explain its natural processes and historical events for various purposes. Human talent has been adopting various approaches to achieve this important goal, but it was unsuccessful in many cases. The foundation of modern science is grounded on the theory that observation and experimentation are the most reliable methods to uncover the truth of the world. Philosophers, however, emphasize the rational approach. They hold that the truth may manifest itself and it may be uncovered by means of investigation and removing the veil which may not be an easy task. However, once truth stands revealed before human intellect it has the power to see it and distinguish it from falsehood. It is the hypothesis of this article that the Qur'ānic approach on the natural and human phenomena plays an important role in integrating and synergizing the above two approaches. This claim is based on many factors, including the fact that the holy Qur´ān integrates different approaches with rational and empirical qualities to invite human attention for investigation. The holy Qur`an also, provides the epistemological and metaphysical principles that are useful for both methods of inquiry.

Keywords: *scientific inquiry, motivation, normative and descriptive knowledge, ethical norms, the natural phenomena.*

Abstrak: Artikel ini membahaskan pendekatan al-Qur´ān terhadap persoalan sesuatu pengetahuan yang menekankan kedua-dua kaedah rasional akal dan uji kaji. Ianya mewakili pelbagai teknik yang di ambil dari al-Qur'ān untuk menaikkan tarikan pada kajian ilmiah, seperti memberi inspirasi dan membuat sistem persoalan. Manusia perlu memahami aturan bumi dan menghurai prosesnya yang semulajadi dan kejadian sejarah untuk pelbagai matlamat. Kebolehan manusia telah pun mempunyai pelbagai pendekatan untuk mencapai matlamat yang penting, tetapi ianya tidak berjaya disebabkan beberapa kes. Asas sains moden telah menjadi tapak kepada teori yang mengkaji dan meneliti adalah kaedah yang paling dipercayai untuk membuka kebenaran dunia. Ahli falsafah bagaimanapun telah menekankan pendekatan akal dan rasional. Mereka percaya kebenaran akan memanifestasikan dirinya dan boleh dibongkarkan dengan kajian yang mana ianya bukanlah sesuatu yang mudah. Walau bagaimanapun, sekiranya kebenaran terungkap sebelum kepandaian manusia, maka ia mempunyai kuasa untuk melihat kebenaran dan melupuskan kesalahan. Kesimpulan yang dapat diambil dari penulisan ini bahawa pendekatan Qur´ān ke atas benda semula jadi dan fenomena manusia memainkan fungsi yang penting dalam penyatuan integrasi dan sinergi antara dua pendekatan di atas. Tuntuan ini berdasarkan banyak faktor, termasuklah fakta yang menunjukkan al-Qur´ān itu menghimpunkan pelbagai pendekatan di antara kualiti rasional dan uji kaji untuk menarik perhatian manusia untuk mengkajinya. al-Qur'ān juga menyediakan prinsip-prinsip teori dan abstrak yang sangat diguna pakai dalam kedua-dua kaedah persoalan.

Kata kunci: persoalan saintifik, motivasi, pengetahuan normatif dan deskriptif, norma-norma etika, fenomena semula jadi.

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Introduction

The analytical study of the holy Qur'ān, in relation to scientific inquiry, is fruitful in various senses. *Firstly*, the holy Qur`ān develops curiosity and motivates scientific research by shifting the attention to the regularities and systematic orders of the natural phenomena. *Secondly*, it provides the general principles for scientific research methods and gives some detailed knowledge on the natural world. *Finally*, the holy Qur`ān provides useful insights to professional scientists for developing research hypotheses, especially on natural phenomenon. The Qur'ānic approach to scientific inquiry, generally, assists to develop both the epistemological and metaphysical foundations of scientific research. In fact, there are enormous works and large literature on the topic of Qur`ān and science, but the above three dimensions are yet to be investigated.

Importance of this topic, nevertheless, emanates from the fact that scientific inquiry is the basic factor which determines the future of every nation with regard to its civilizational and social development, which is essential for a meaningful life. Knowledge, associated with moral values, provides the mechanism for development and progress to every nation and formulates the guiding force of its being, survival, and growth. Therefore, it is hard, according to Ibn Khadun's theory of *Umran*, for a civilization to flourish and create a great nation without scientific progress. Curiosity and research spirit are the vital sources of scientific research (ibn Khaldun*:* 290). Driven by these two forces, mankind has been investigating to uncover the general principles that govern the created world and to find unity in the diversity of the natural process. Human talent, across the history, has been adopting various approaches and different methods of investigation, including measurable and immeasurable methods, some of which were already proved unsuccessful. The final goal of this tireless investigation of mankind is to uncover the general principles that govern the world and the Power behind it. Through curiosity, man begins to observe and investigate to formulate scientific theories and establish glorious civilizations.

The holy Qur`ān promotes the entire process of scientific inquiry through building the scientific mind and creating research spirit. It is no doubt that the holy Qur`ān does address certain aspects of the natural phenomena, human history and socio-economic relations, but the crucial role that the Qur'ānic approach can play in scientific enterprise lies, not in the detailed information as usually has been thought, but more importantly in providing the general principals of scientific inquiry and establishing foundations of research method which constitute the basic epistemological parameters that are capable of creating research culture and maintaining interest in science. This article examines the above presupposition, that is the Qur`anic approach to science is based on rational and empirical methods. The method adopted by the author is analytic in nature.

2. The Qur'ānic Wisdom on Knowledge Inquiry

The holy Qur`an initiated its revelation by '*Read*' (إقرأ), which emphasizes the importance of seeking knowledge and scientific inquiry that aims to implant a culture of reading and learning in Muslim community. Adopting the relevant method in the process of inquiry, from the Qur'ānic perspective, is even more important because the irrelevant method of inquiry not only leads to nothingness but to ignorance. Taking ignorance or false knowledge as truth develops close-

mindedness and leads to intellectual stagnation. Therefore, the holy Qur`ān has disqualified and eliminated all irrelevant approaches of inquiry, such as black magic, mere speculation, and blind imitation. Curiosity, objectivity, open-minded observation, and empirical testability are the valid methods of inquiry from the Qur'ānic perspective, besides creative thinking and analytic reasoning.

The dawn of scientific inquiry, according to the holy Qur`ān, emanates from curiosity and observation, as obviously reflected by the following verse: [*Have they not look up at the camel how it was created? And at the sky how it was raised up? And at the mountains how they were embedded? And at the Earth how it was smoothed out?* (Q. 88:17-20)]. The method of investigation through observation is emphasized in many other Qur'ānic passages: [*Do they not look at the sky above them how We have made it and adorned it, and there are no flaws in it? And the earth, We have spread it out and set thereon mountains standing firm, and produced therein every kind of beautiful growth (in pairs)- To be observed and commemorated by every devotee turning (to God). And We send down from the sky rain charged with blessing, and We produce therewith gardens and grain for harvests; and tall (stately) palm-trees, with shoots of fruit-stalks, piled one over another* (Q. 50: 6-10)]. In another verse the holy Qur`ān says: [*God is not ashamed to make an example of a gnat or of an even smaller thing. As for those who believe, they know it is the truth from their Lord. But as for those who do not believe, they ask: "What does God mean by this example?" He misguides many by it and guides many by it. But He only misguides the deviators*] (Q. 2:26).

The holy Qur`an, also, emphasizes on the method of inductive reasoning as following: [*Behold! in the creation of the heavens and the earth, and the alternation of night and day, there are indeed signs (Ayat) for men of thought; those who appreciate the Creator in all conditions: standing, sitting, and lying on their sides, and contemplate the wonders of creation in the heavens and the earth, saying: Our Lord! You have never created this perfect world in vain without purpose!* (3:190-191)].

An analytical study of such Qur'ānic verses concludes that the scientific research is not only required for material development, but more importantly it is the basic means to understand the Creator. To fulfill this noble goal of knowledge inquiry the Qur`ān adopts a method of learning which is similar to that of early childhood education to build the scientific mind.

2.1. Fostering the Scientific Thinking

While its final goal is to establish a meaningful life that is based on faith in God, the holy Qur`ān discusses various topics on physical and metaphysical worlds. It talks about the natural phenomena and addresses various topics of scientific concern, such as astronomy, cosmology, creation of mankind, creation of the universe, and astrophysics. The holy Qur'ān also talks about moral community which is based on brotherhood, as well as social justice, economics and good leadership. Such Qur'ānic approach on knowledge inquiry inspired and motivated the early scientists and scholars, from various nations, ethnicities, cultures, and from different religious backgrounds to engage in scientific research and guided them to explore the different fields of natural and human phenomena.

In its method of approaching the natural phenomena, the Qur`ān provides knowledge on various levels. For example, at the first level it provides knowledge on the surface which is necessary for religious consciousness that can be embraced by common man. While at the higher level the holy Qur'ān provides insights which necessitate investigation and research beyond the surface. At the first level of the Qur'ānic text, besides understanding religious requirements, every reader of the Qur`an can "feel" the existence of a system, an order, and witness the beauty of the natural phenomena; but it is the scientists, however, through their probe into the depths of mysteries of nature, who find the system and discover the facts that exist beneath the surface (Fazlur Rahman. 2001: 92-93).

To foster a scientific mind, the holy Qur'ān adopts different strategies. Raising questions that invite more reflective thinking and further exploration, is one of the Qur'ānic strategies. Following are examples of productive questions that foster scientific thinking:

i. Attention-focusing questions which call attention to significant details, such as how certain objects are made? The Qur`ān says: [*Then let man look at his food, how We provide it, We pour forth water in abundance, then We split the earth in fragments, then We produce therein the seed* (Q. 80:24-27)]
ii. Measuring & counting questions which generate more precise information, such as how many? how much? and how heavy? The Qur`ān says: [*They do not see that how many of those strong generations on earth before them We have destroyed them due to their attitudes*? (Q. 6:6)]
iii. Questions of comparison which foster analysis and classification, such as how are they alike? and how they are different? The Qur`ān says: [*Do a knowledge person can be equal to who has no knowledge?* (Q. 39:9)], [*These two groups of men are just like a blind and deaf, and those who can see and hear well, are they can be equal, then you cannot take heed?* (Q. 11:24)]
iv. Questions of actions which encourage exploration of properties and events; also encourages predictions, such as what if…? The Qur`ān says: [*How will be their situation when we gather them together in a day about which there is no doubt (day of judgment), when each soul will be paid just what it has earned without any injustice*? (Q. 3:25)].
v. Problem-posing questions, which aim to support planning and finding solutions to problems, such as how could we do this? Allah raises this type of question as following: [*Do they not consider the Qur'ān carefully? If it had been from other than Allah, then they would have found therein many inconsistencies* (Q. 4:82).
vi. Reasoning questions which aim to encourage reflection on experiences and construction of new ideas, such as why do you think? Can you explain that? (Ruth Wilson, n.d) The Qur`ān says: [*You requesting other people to enjoin the right conduct, yet you forget your own selves, while you are studying the Scripture? Do you have no intellect*? (Q. 2:24)].

Asking questions to stimulate curiosity and creativity has proven helpful for all kinds of endeavors, whether problem solving, product development, inventing, or communication. These questions are especially useful for generating ideas for improving scientific thinking, but they also help to break thinking out of the evolutionary mode and put it into the revolutionary mode by returning the thinker to the origin and purpose of the idea or solution. By returning to the roots of the problem, a new vision can be created (Robert Harris, 2002).

The holy Qur`ān provokes human intellect to reactivate its capacities and open the doors of research in nature as following: [*Do they not look at the sky above them How We have made it and adorned it, and there are no flaws in it? And the earth, We have spread it out and set thereon mountains standing firm, and produced therein every kind of beautiful growth (in pairs)- To be observed and commemorated by every devotee turning (to God). And We send down from the sky rain charged with blessing, and We produce therewith gardens and grain for harvests; and tall (stately) palm-trees, with shoots of fruit-stalks, piled one over another* (Q, 50: 6-10)]. The exhortation to ponder and investigate natural phenomena is only one form of the Qur'ānic wisdom furnished to mankind, in addition to detailed information. However, the most significant form of the Qur'ānic wisdom in relation to science is found in its general principles and concepts that inspire scientific research.

2.2. The Normative and Descriptive Knowledge

The Qur'ānic passages can be classified semantically into two basic categories: (i) normative (*talabi*) which provides values and ethical norms, and (ii) descriptive (*m`arifi*) which provides knowledge and principles of scientific inquiry. Both types are aiming to achieve the same goal which is to guide mankind to the right course to emphasize knowledge of the Creator. In the first type the Qur`ān requires from man to act and behave in accordance with certain ethical standards in his everyday activities, as prescribed in the following verse: [*O mankind! Eat that which is lawful and good on the earth, and do not follow the footsteps of Satan. Verily, he is an open enemy to you* (2:168)]. In the second type, the holy Qur`ān generously addresses various topics of scientific knowledge to provide ideas, principles, and information on understanding the physical world and human phenomenon.

The holy Qur`ān describes the first type, which is based on Divine commandments and clear texts, as established verses '*ayāt muḥkamat*' (Q. 3:7) or detailed verses '*ayat mubayyinat*' (Q. 65:11), where all the essential knowledge for meaningful life is provided either by the Qur`ān itself or by practice of the Prophet (s.a.w). The major objective of this type is to articulate ethical norms and moral values. The second type of Qur'ānic passages, which contains the descriptive discourse, provides principles and insights for investigation of the natural phenomena rather than detailed knowledge. This type is named by the holy Qur`an as ambiguous or unclear verses '*ayat mutashabihat*' (3:7), which provides knowledge at various levels because semantically it can be understood in different manners.

These two types of Qur'ānic verses constitute the two forms of knowledge that are needed by mankind for a meaningful life, i.e. knowledge of facts and value. The normative verses, in fact, are not totally free of descriptive knowledge, and the opposite is also true. The normative knowledge of Qur'ānic verses or '*ayat muḥkamat*', addresses three major realms: (i) the metaphysical facts, i.e. information about the unseen (*ghayb*), such as the nature of God, His names and attributes, names of angels and their functions; events of the Hereafter and the final destiny of mankind. Knowledge that concerns all these realms is provided in detail. (ii) The field of legal rules (*ahkam*) and code of conduct (*akhlaq*). (iii) The third type of *'ayat muhkamat*' is more related to the descriptive field; it aims at establishing the epistemological principles and metaphysical foundations of knowledge inquiry.

Based on all these forms, the holy Qur`ān creates research spirit essentially through provoking human intellect and creating curiosity to develop the internal motivation[1]. The holy Qur`an, also, develops interest in research through providing the basic principles of scientific research, such as systemization of knowledge and general statements. Motivation and inspiration are the basic requirements of engagement in science, therefore, the Qur`ān furnishes an extended range of its verses for this purpose[2].

3. The Qur'anic Approach on Promoting the Scientific Enterprise

The three major Qur`anic approaches that promote the scientific enterprise are motivation, inspiration, and establishment of epistemological principles for descriptive knowledge. The holy Qur`ān emphasizes that it was revealed to eliminate darkness by disseminating light and bringing people to the truth (Q. 57:9). Philosophers of science believe that the truth may manifest by itself or it may be uncovered by means of investigation and removing the veil which may not be an easy task. But once the truth stands revealed before human intellect it has the power to see it and distinguish it from the falsehood (Popper, 1989: 5). The birth of modern science and technology was inspired by such optimistic epistemology. The Divine revelation through the course of history has been playing the role of "removing the veil". It has been the basic source of inspiration to mankind to investigate nature[3]. It is true that, some misconception and misinterpretations of the Divine scriptures had hindered scientific progress in many occasions in human history, but the Qur'ānic attitude towards science was totally different; and somehow has been exceptional. Adopting a comprehensive method of description and classification, the Holy Qur`ān approaches science from three integral dimensions: Motivation, inspiration, and providing the epistemological principles. These three aspects of Qur'ānic approach on science are integrative and collaboratively work within the Islamic code of ethics to build a scientific mind which is essential to cultivate knowledge and achieve the final goals of the Qur'ānic revelation.

The inspiration for the study of nature in Islam, straightly comes from the holy Qur`ān which repeatedly asks people to systematically investigate natural phenomena, not only as a means for understanding nature but also as a means for getting close to God. The Qur`ān, in its approach to study nature, attempts to synthesize reason and revelation, knowledge and values; knowledge acquired through human efforts and that attained through Divine revelation, which are seen as complementary; both are signs of God which enable man to study and understand nature.

3.1. The Motivation

Using different techniques, the holy Qur`ān motivates human intellect to engage in investigation of the created in order to understand and appreciate the Creator. 'Motivation', throughout the history of modern science, has been the niche area and fertile soil for educational research and psychological theories. Motivation, means an internal or external stimulus behind certain

[1] Only the first two types of the Qur'ānic verses were the focus point of classical studies on the Qur`ān, while the third type was almost totally ignored.
[2] Almost one eighth of the Qur'ānic verses (750) are talking about science and knowledge (`Ilm & Ma`rifah).
[3] Even Divine Miracles can shift human attention to science and provoke his intellect for research!

conduct, behavior, or act. Human beings can be motivated by many things, such as material needs, threat, and rewards. The general motivational concepts are: need, drive, desire, want / wish, goal, and so on. There are many psychological theories that have been developed to highlight human motivation, such as the biological perspective theory[4], behavioral theory[5], and cognitive theory[6]. However, the comprehensive view on this topic, including motivation for knowledge inquiry, was presented by Abraham H. Maslow in his eminent work "*A Theory of Human Motivation*"[7].

The basic human needs, according to Maslow, are organized into a hierarchy of relative prepotency, therefore, an individual feels his need for the second level only after satisfying the first level. For example we feel the need for safety only after we satisfy our hunger first. Abraham Maslow summarizes the basic idea of his theory as following: (i) There are at least five sets of goals that justify human behavior, known as basic needs. These are briefly physiological, safety, love, esteem, and self-actualization. In addition, we are motivated by the desire to achieve or maintain the various conditions upon which these basic satisfactions rest and by certain more intellectual desires. (ii) These basic goals are related to each other, being arranged in a hierarchy of prepotency. This means that the most prepotent goal will monopolize consciousness and will tend for itself to organize the recruitment of the various capacities of the organism. The less prepotent needs are minimized, even forgotten or denied. But when a need is fairly well satisfied, the next prepotent need emerges, in turn to dominate the conscious life and to serve as the center of organization of behavior, since gratified needs are not active motivators[8].

The basic needs theory, at its theoretical level seems to be acceptable, however, at least from religious perspective there are two main questions about the scope of this theory: firstly, there is no mention about spiritual needs, which are essential, basic, and undeniable in human domain; secondly, how about the question of final destiny of mankind, because human beings might behave in certain ways due to the unknown destiny of their life. The ultimate happiness is hard to be attained in this temporary world and short life span of an individual. The human need to answering such critical questions is perfectly used by the holy Qur`an to motivate knowledge inquiry.

3.1.1 The Motivation by Promoting Human Interest

The holy Qur`ān motivates human intellect for knowledge inquiry by establishing the principle objectives of legal rules and ethical norms which protect the ultimate human interest (*maslahah*). Principles of '*Maqasid*' introduced by the holy Qur'an have been elucidated by Muslim jurists. Abu Isḥaq al-Shātibī, in his theory of *Maqsid al-Sharʿiah*, which means the basic objectives of Islamic legal rules, identifies basic human needs based on another criterion, which is different from that introduced by Abraham H. Maslow. The central point of al-Shatibi's perspective is based on human interest (*Maslahah*), and addresses both materialistic and spiritual aspects of

[4] This theory holds that our genes play a vital causal role in motivation. In other words, it believes that ultimately all our behaviors are motivated by evolutionary survival needs.

[5] This theory argues that the behavior of an organism is not strictly result of instincts but is modified by environmental consequences.

[6] Cognitive theory believes that motivation is caused by rational and deliberative process than the biological and behavioral perspectives allow. It inserts conscious processes into the study of motivation and considers it as an important influence on human behavior.

[7] This article is original published, since 1943 in "Psychological Review", 50, 370-396.

[8] http://www.altruists.org/f62

human needs. He first classifies the entire human needs, based on its importance to human life both as an individual and as a community, into three categories: (i) Necessities (*Ḍaruriyyat*); (ii) Needs (*Hajiyyat*); and (iii) Complimentary (*Taḥsiniyyat*). Necessities are the basic needs that fulfill the main requirements of a meaningful life, which are: preservation of religion, preserving human life, preservation of mind, preservation of progeny, and finally protection of property. Needs are everyday requirements, to maintain normal life, which make human live extremely hard without it, such as economics, politics, and social communications. Complimentary, are much less needed with reference to the above two levels, such enjoying a luxurious life based on Islamic guidelines[9]. According to al-Shatibī, and also other Muslim scholars, the entire legal rules that were revealed in Divine Scriptures are mainly aimed at preserving and maintaining these three levels of human needs. Satisfaction of all forms of needs depends on knowledge; therefore, the holy Qur`ān uses all the above categories of needs to promote knowledge inquiry for both spiritual and material purposes.

3.1.2. Internal and External Motivation

Motivation, generally, comes from two different sources: first, internal source, i.e., one's own self; and second, external source. These are known as intrinsic and extrinsic motivation, respectively. The intrinsic motivation comes from the inside, such as investigation of nature to fulfill religious requirements, or involvement in research just to satisfy curiosity. The researchers are likely to be intrinsically motivated if:

- They attribute their research activities to internal factors that they can control, such as the amount of effort they put in research without any tangible reward;
- They believe that they can be effective agents in achieving desired goals, i.e. the results are not determined by material interest;
- They are interested in mastering the topic, rather than achieving other material goals.

The extrinsic motivation, on the other hand, comes from external sources, rather than one`s' own self. Money, rewards, and competition are the most common examples. However, any other material goal or even threat can be extrinsic motivation. Competition is an extrinsic motive because it encourages the performer to win, not only to enjoy the reward of the activity, but also to challenge others. The Holy Qur`ān considers competition of people towards doing good as a religious requirement and recommended. It provides an attractive description of living in Paradise, as the following verse comments: "*let them strive and make competition among themselves towards gaining Paradise* (Q. 83:23). The Qur`ān recommends extrinsic motivation, but the Qur'ānic motivation itself is all intrinsic. Social psychological researches, however, have indicated that extrinsic rewards can lead to over justification and subsequently reduction in intrinsic motivation[10]. Through intrinsic motivation, the Holy Qur`ān articulates the desire for knowledge inquiry to create culture of long-life learning and make it as a habit in the Muslim community.

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[9] Al-Shatibi, Abu Ishaq Ibrahim bin Musa (2004), **al-Muwafqat Fi Usul al-Shari`ah**. Dar al-Kutub al-Ilmiyyah (Beirut –Lebanon). P. 219.

[10] In a study demonstrating this effect has found that, children who expected to be rewarded, or were awarded, with gold star for drawing pictures spent less time playing with the drawing materials in subsequent observations than children who were assigned to an unexpected reward condition and to children who received no extrinsic reward.

3.1.3. Research Motivation

Acquiring knowledge and systematizing the natural processes are considered as major techniques for the achievement of basic needs and safety against disasters and the unknown. Actually, knowledge, science, and technology, in modern communities have become basic tools for satisfying basic needs, such as food, safety, energy, and health. There are many internal and external factors that can create motivation for research activities, such as personal motives and cultural environment. However, people are generally motivated in scientific research by three stimuli, namely: (i) material needs, (ii) spiritual needs, i.e. religious stimuli; and (iii) cognitive needs, i.e. satisfaction of mere curiosity that might be regarded as intellectual requirements.

Research motivation can be related to any one or all of the above three sources of motivation. However, according to the modern philosophy of science, motivation for research is part of Human Needs theory in general; therefore it removes spiritual sources of motivation. Healthy research environment, freedom of inquiry and expression, are preconditions of research motivation towards satisfying basic needs. Curiosity, desire for exploration, the need to understand facts, and desire to know; all are aspects of research motivation. In fact, knowledge and satisfying curiosity are often pursued even at great cost of the individual's safety. Even after considerable amount of knowledge is obtained, man is eager to know more and more (ibid, n.d). The question arising now is that, how we can create such eagerness and determination for research upon ourselves in modern life? In other words, how we can create sustainable research culture in modern Muslim communities?

According to the Needs Theory, satisfaction of the researcher's basic needs is a precondition for research motivation. Taking into consideration that the basic needs are in hierarchy: starting by satisfaction of physiological needs, safety, and so on. In other words this theory stresses that science cannot grow and flourish in an environment of starvation, hunger, and terror (ibnu Khaldun: 344). Beside that the due honor and respect must be given to those who have been striving to make the natural phenomena are understandable and contribute in the development of the human community.

The Holy Qur`an urges for eradication of hunger and terror, thus, it reminds people about these endowments of God: [*So let them worship the Lord of this House (the Ka'bah), Who has fed them against hunger, and has made them safe from fear* (106:3-4)]. Hunger and fear are most dangerous enemies of mankind. On the other hand, the Qur`ān honors the knowledgeable people in the community (*Ulama`*) and give them their due respect, and also the Prophet (s.a.w) said "*The scholars are the inheritances of the Prophets*" (al-Ghazali). The Qur`ān says: [*The knowledgeable people are not equal to those who have no knowledge* (Q. 39:9)]. It also gives scholars the highest position in the view of God, saying: [*The most fearful of God among His slaves are those who have knowledge* (*Ulama`*) (Q. 35:28)]. Honoring the knowledgeable people in the community, no doubt, will motivate others and urges them to be involved in scientific research. Therefore, Islam considers providing honorarium awards and research grants as extrinsic elements that support the intrinsic motivation of the Divine message.

Motivation and determination are the essential factors of any successful work, including research and investigation in nature. The inner or intrinsic motivation is the vital factor of involvement in

research activities. However, in some cases the intrinsic motive for investigation; or the level of aspiration in certain people is lowered or even permanently deprived, just like the case of the pre-Islamic community of *Jahiliyyah*. In such situation the desire for research is simply lost, therefore, no research activities would develop in the community. The Holy Qur`ān condemns such situation and describes those who have no tendency to use their knowledge faculties, i.e. intellect and sensory capacities, to search and investigate the natural phenomena just like animals.

3.2. Inspiration

The determination to do good things, in Islam, is more significant than the action itself. This idea is repeatedly emphasized by Qur'ānic verses, and explicitly expressed by the prominent *Hadīth* of the Prophet which says: "*Innama al-Amalu bill Niyyat*" (an-Nawawī). It means that the value of human action is based on his intention. Thus, Muslims generally believe that the right and valid intention gives sincerity and strengthens the determination to achieve the task in the best manner. On the other hand, the task or action which is based on invalid intention has no value and only produces discouraging and negative results. Therefore, the Qur'ānic based motivation is mainly intrinsic. It relies on revealed guidance as its main source of action and endeavour for investigation.

Inspiration may refer to gaining insights, visions, and creative ideas out of measurable methods of inquiry. Many new inventions were not result of deep thinking and careful investigation; rather they are due to sudden observation produced by inspired ideas. Inspiration is known in the Qur'ānic terminology by many names, such as *Ilham* (intuition), *Wahy*[11] (inspiration), and *Basirah* (insight/vision). Inspiration comes in two forms: (i) direct inspiration, such the case of Prophet Musa's mother, when she threw her child away into the deep water for his safety; and (ii) indirect inspiration, which can happen to everybody in different occasions. In all cases, inspiration includes deep insights, aspiration, and creative ideas. The inspiration can be in various activities, such as artistic inspiration, but the best of all is that which comes in form of creative ideas, such as the suggestion of one companion of the Prophet (s.a.w.) to change the location of warfare in the battle of *Uhud*, accordingly the Muslims succeeded in that war. According to Ibn Qayyim al-Jauziah, inspiration comes in ten levels, the highest of which is revelation to the Prophets, which is known as (*wahy*), meanwhile the lowest level is a dream of the common people (al-Jauziyyah, 1999).

Inspiration, in the context of scientific research, can be in many forms; such as insight, vision, aspiration, ambitious, creative and critical thinking, producing clear views, and so on. However, the best of all is being granted the wisdom from God, which means the ability to discriminate between the truth and falsehood. The Qur`ān says: [*Allah grants hikmah (wisdom) to whoever He wills, and whoever granted Hikmah he has granted a great treasure* (2: 269)]. May Allah grant us His *Hikmah*!

[11] Actually, the term "*Wahy*" literally means secret inspiration, but in the Qur`ān it comes in two senses, or two levels, the first type is wahy to the Prophets, which is higher level and known as Revelation; the second type of wahy is inspiration to ordinary people, such as wahy to the Mother of the Prophets Musa. This later type also includes others animal, such as wahy to the bee as mentioned in the Qur`an.

3.3. Principles of Qur'ānic Epistemology

The greatest wisdom that might be gained from the Qur`ānic approach on scientific knowledge may come from key scientific concepts, abstract statements, and systemization of inquiry. All these constitute foundations of epistemological principles that guide the intellect towards systematic research methods. An extended study on principles of Qur`ānic epistemology and systematic inquiry is furnished in another work by the author, but what is possible in the present work is to provide a list of such key scientific concepts and epistemological principles as following:

- The concept of *`Ilm* and *Ma`rifah*
- The principle of *Taqdier*
- The principle of *Huda* / *Hidayah*
- The principle of *Sunnatullah*
- The principle of *Ayah*
- The principle of *Zawjiyyah* (creation in pair)
- The principle of al-Sababiyyah (principle of causation)
- The principle of *Mu`jizat* (tangible / material miracles)
- The principle of *Taskhier*

4. The Descriptive Knowledge in the Holy Qur`an

The term 'descriptive' here means the fact, insights, and principles of knowledge that are provided by the holy Qur`ān in various disciplines, especially investigation in natural phenomena. This is the third dimension of the Qur`ānic approach on scientific inquiry, besides motivation and inspiration. The holy Qur`an not only inspires and motivates for research, but also provides some detailed knowledge and comments upon the visible and invisible worlds. The multipurpose approach of the holy Qur`ān on the study of nature has been observed by many scholars of Qur'ānic studies. Maurice Bucaille (2003) expressed his view on this matter as following: "The Qur`ān, while inviting us to cultivate science, itself contains many observations on natural phenomena and includes explanatory details which are seen to be in total agreement with modern scientific data. There is no equal to this in the other divine scriptures" (Maurice Bucaille, 2003: 126). In fact, the holy Qur`ān also provides some guidelines about the investigation of natural phenomena through the three levels; i.e. description, classification, and information[12].

The holy Qur`ān presents information, ideas and arguments systematically and coherently. As asserted by many scholars, the Qur`ān is not a textbook of science that expounds upon cosmological or scientific matters; rather it is the eternal book revealed to humanity for leading a meaningful life. It provides keys to understand the hidden realities behind the events taking place in nature and human phenomenon. It is a book of law and wisdom, worship and prayer, divine

[12] The Qur`ānic method of three levels of knowledge can be found in many verses, e.g. the holy Qur`an says*: [Indeed We have created man originally out of an extract of clay * Thereafter We made his offspring as a Nutfah: mixed drops of the male and female in a safe lodging in womb * Then We developed the Nutfah into a clot, a piece of thick coagulated blood, then We developed the clot into a little lump of flesh, then We made out of that little lump of flesh bones, then We clothed the bones with flesh, and then We brought it forth as full creation. So Blessed is Allâh, the Best of creators* (23:12-14)]. Terms '*Nutfah*', `*Alaqah*' and '*Mudghah*' give three types of knowledge.

commands and prohibitions. It fully satisfies human needs; spiritual and intellectual, and addresses theological, social, economic, political, and scientific issues.

To achieve its religious objectives the Qur`ān refers to nature, history, as well as to human himself (ʿAli Unal, 1998: 59-61). Through the reflection on nature, the Qur`ān presents all created world in front of man`s eyes and urges him to study nature and to observe the stars and galaxies in universe. It also exhorts us to direct our attention towards the miraculous nature of human physiology and the physical world (ibid: 73). The detailed information of the Qur`ān on the physical world mainly addresses three areas: (i) the natural sciences, such as cosmology and astrophysics; (ii) human sciences, such as sociology, economics, and politics; and (iii) human history and civilization. In all these fields the Qur`ān basically addresses the philosophy of the field, i.e. the wisdom of such detailed knowledge, rather than providing mere information. The main objective of the revealed knowledge is to instill the general principles and leaves the possibility of its understanding to the capacity of each generation according to the science available at the time.

4.1. The Natural Sciences

The systematic events of the natural world have drawn the attention of mankind since the dawn of human history. Throughout the Qur`ān, there are many verses talking about nature; including the earth, heaven, sun, moon, clouds, rain, winds, plants, animals, ships traveling upon the sea, in sum all the natural phenomena that are observable to mankind. The significance given by the Qur`ān to the study of nature inspired early Muslim scientists to pursue knowledge through observation and experimentation. Investigation in the natural phenomena, in the Qur'ānic view is an essential form of worship (ʿ*ibadah*) therefore; the Qur`ān establishes its philosophy of science on religious bases and addresses various fields of natural sciences.

Laws governing the natural phenomena are studied in different branches of natural sciences, such as physics, chemistry, biology, astrophysics, and medicine. Besides these, there are the different branches of applied sciences, such as technology and engineering. The Holy Qur`ān is not concerned with explaining theories of the natural sciences, but it refers to any event in nature deemed to be important to draw human attention towards the systematic process of the natural phenomena. The Qur`ān refers to astronomy, flora, fauna, human physiology and reproduction, physical phenomena, phenomena of society, human history and geography. Therefore, we find many hints for the scientific facts in the Qur`ān. On the other hand, modern science provides great opportunities to gain new insights for understanding the true meaning of many of the Qur'ānic verses. As science grows it gives deeper understanding about the natural world and provides more horizons for learning and understanding of the holy Qur`ān. This is the great wisdom behind the Qur'ānic encouragement to gain insights in the research of the universe to uncover the hidden facts of the created world.

The holy Qur`ān, also, provides insights about the basic sciences in the universe such as matter, energy, system and life. These are the sciences by which man gains power over nature, strengthen man's faith, and creates fear of God which is the chief objective of human life. The Qur`ān not only speaks about the crucial role of science in reshaping our life, but also draws our attention and directs us to pursue knowledge and discover the secrets of the universe. In this

sense, the holy Qur`ān is a source of all sciences, as well as being a source of human civilization. The holy Qur`ān, with its informative statements, establishes the foundations of many scientific disciplines and provides hints for how to deal with them. This is the main reason that the early generations of Muslim scholars, who were imbued by Qur'ānic revelation, excelled in many of fields of the scientific enterprise. They analyzed the Qur'ānic references to various scientific subjects and studied the major Qur'ānic verses on astronomy, physics, embryology, and many other subjects to guide them in scientific research. The Qur'ānic principles on natural phenomena give useful insights to the researchers, as well as blessing, and encouragement to engage in science (Ibid: 11-12.). The Qur'ānic approach on science should reawaken the enthusiasm of contemporary Muslim scholars and scientists and rekindle the desire for further research, as the Qur`ān itself supposes and supports such undertaking.

4.2. Human and Social Sciences

The modern research methodology divides the whole body of knowledge into two basic fields: (i) the natural sciences which describe the observable process of the natural phenomena in the tangible world, such as biology, physics and chemistry. (ii) Human and social sciences which especially focus on human activities at both individual and collective levels. This includes all sciences that are related to social life, such as economics, law, and politics. The holy Qur`ān actually focuses on human and social phenomena, because it was especially revealed to guide mankind to the right course. Therefore, the Holy Qur`ān and its official interpretation which is the Sunnah of the Prophet (s.a.w.s.) contain a complete set of guiding principles in all branches of human sciences. For example, the Qur`ān establishes the foundation of economics on philosophy that all properties are originally belong to God, human own nothing when he came in this world, therefore, he must gain his wealth in lawful ways and also distribute it in lawful ways as assigned by the Qur`ān itself. Based on this philosophy, Islam forbids all kinds of unlawful activities in economics and unlawful means of gaining wealth. The Qur`ān also provides general principles as well as minutely detailed rules of law which guide all social interactions (*muaamalat*) in daily life matters.

The major objective of the Qur`ānic approach on human sciences is to build a community and civilization which is based on knowledge and virtue; the community (*ummah*) which is capable of handling the mission of the Divine trust and the task of vicegerency (*khilafah*) on earth; such community which is eager to perform the duty of worship (ʿ*ibadah*) (al-Maududi, 1988: 18).

4.3. History and Civilization

The conception of history in Islam is based on the ultimate Divine patterns, named by the holy Qur`ān as '*Sunnatuallah*'. These patterns rule the civilizational activities of the human community, and identify its directional course either towards progress and development or towards declining and disintegration. Therefore, the holy Qur`an obviously declares that every nation has its own records book which reflect its worldview and the directional course of its activities, either constructive or destructive, guided by the ultimate values that are in service and dedication of that certain nation to protect those values. Actually, the concept of Sunnatullah which based on the ultimate law of God is the central force that controls the dynamics of human history. According to the Qur`an, many civilizations and nations in human history were

destroyed due to violation of these divine patterns, i.e. the uncivilized behaviors and lack of moral values. This ultimate law of God, Sunnatullah, is applicable on every nation across space and time.

To maintain the effectiveness of the past and its role on the present, the Qur`ān provides detailed presentation of historical events, which reflects the real sources of conflict between the truth and falsehood, between the constructive and destructive acts of mankind throughout history. The main objective of all stories of the Prophets in the Qur`ān is to deduce lessons of the past and to remind again and again about the ultimate rule of God on nations and communities. According to the Qur`anic philosophy of history, the present which is connected with the past bears the future within itself; therefore, the mission of the present consists of setting the future in motion (Wan Mohd Nor Wan Daud, 1989: 10,67). Through these stories the holy Qur`ān establishes the relevant method of investigation in historical events and provides the guiding principles which rule all aspects of human phenomenon. Traveling on the earth, studying historical events to understand fate of previous civilization, reflection on the old legacy of ancient nations are the essential aspects of history as suggested by the Holy Qur`ān. This constitutes an integral study of history, archaeology, comparative religion, sociology, etc. Through the historical method, Muslim scholars will be able to derive moral lessons from the past. According to the Qur`an, the past is the field for the future's seeds and a mirror of its potentials. The future is the time to reap the harvest of the past and a mirror to the present and the actual situation (Ali Unal, 1998: 70, 72).

Although philosophy of history was heavily presented in Qur'ānic verses, unfortunately, no considerable literature was found in Muslim works on the subject, except the substantial work of Ibn Khaldun "*al-Muqadimah*" which was unique in this field. The true value of Ibn Khaludn's contribution was noted by the eminent British historian Arnold J. Toynbee, and many other contemporary Western historians. However, more attention was given to the Islamic philosophy of history by modern Muslim historians starting from the second half of the twentieth' century. Today, some new valuable contributions can be found in the field, such as '*Tafsīr al-Tarīkh*' of ʿAbdul Hamid Sidīqi, 'a*l-Sunan al-Tarīkhiyyah fi al-Qur`an*' of Muhammad Baqir Sadar, 'a*l-Tafsir al-Islamī lil-Tarīkh*' of Imadudin Khalil, and '*al-Sunan al-Ilahiyyah fi al-Mujtamaʿāt*' of ʿAbdul Karim Zaidan, are some good examples.

5. Concluding Remarks

Creation of curiosity and research motivation constitute the subject matter of Qur`anic approach to scientific inquiry. It is true that an extrinsic motive for research can be found through short-term goals, such as awards and research grants, but the original and strategic motivational force can be found only in the worldview of every nation and its cultural tradition. Inculcation of curiosity and formation of creative minds, therefore, was the main objective of the holy Qur`ān. The result of this Qur'ānic approach on science was obviously demonstrated by the eminent works of early Muslim scientists and scholars in various fields of scientific knowledge. Most of those works were taken as textbooks and references in many parts of the world for many decades.

The scientific spirit in Islam, today once again, needs reactivation for research and investigation in natural and human phenomena. For gradual achievement of this strategic goal, the Muslim scholars might need to consider the following two points:

1. Maintaining peace, satisfying the basic needs of researchers, and eradication of poverty; as asserted by Needs Theory, are important aspects of research motivation. However the most strategic factor in the case of Muslim communities is the mobilization of spiritual power that is provided by the religious sources for knowledge inquiry. The Qur'ānic approach on science must be fully utilized to create research spirit among Muslim scholars and scientists. While all other approaches can offer only extrinsic motives, religion provides both the intrinsic and extrinsic motivations. The master mind of modern physics, Albert Einstein was deeply aware of this fact, when he said: science can be created only by those who are thoroughly imbued with the aspiration towards truth and understanding, and such feelings lies in the sphere of religion situation (Ali Unal, 1998: 100, 101). In his famous essay "*Atomic War or Peace*", Einstein captures the helplessness of scientists to influence research motivation, he said: the atomic scientists, I think, have become convinced that they cannot arouse the American people to the truth of the atomic era by logic alone; there must be added the deep power of emotion which is the basic ingredient of religion (ibid).

2. While they are searching for the best method to reactivate their creative intellect for research by their own religion, contemporary Muslim intellectuals have to revise their religious thought. To be a religious person, according to the Qur`anic verses, is to "Read" both Books: the book of nature and the Revealed Book which commenced by 'reading' (*Iqra*), so it was able to create the Islamic civilization. It is due to some historical and cultural factors, that the concept of Reading in the Qur`ān was conceptualized only in a legal context. It was interpreted as "Inferring legal rules from the revealed text". This mode of inference has nothing to do with nature; therefore, a Muslim view on the dynamic process of nature became static. Progress and development of society was thought to be provided directly by Almighty God without any considerable efforts from Muslims! I think this superficial worldview creates laziness and hinders every effort of investigation in the created world to enhance the faith in the Creator, as required by the holy Qur`ān. This fact has been noted by many scholars. The modern scientist and surgeon Maurice Bucaille, in his eminent work "*Bible, Qur`an and Science*", appreciated the Qur`ānic approach on science, but he could not avoid the fact that: "it would be wrong to imagine that, in the history of Islam, certain believers had never harbored a different attitude towards science. It is a fact that, at certain periods, the obligation to educate oneself and others was rather neglected. It is equally true that in the Muslim world, as elsewhere, an attempt was sometimes made to stop scientific development" (Maurice Bucaille, 2003: 126).

Reconstruction of the scientific mind is necessary step towards developing the scientific spirit. If creation of research culture in the Muslim communities is needed, then the Qur`anic approach towards scientific endeavor must be articulated through developing new curriculums to emphasize the dynamic nature of the natural phenomena as sign of God (Ayah).

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