

**Geniş Özet****Kur’ani Dünya Görüşü ve Doğa Bilimleri: İslami Eğitim Yapan Ortaöğretim Kurumları İçin Bir *Ulül-Elbâb* Uyum Çerçevesi\***Nur Jannah Hassan<sup>1</sup>**Öz**

İslam ümmeti için eğitimde uyum (entegrasyon) meselesi sömürge sonrası dönemden beri önemli sorun olmuştur çünkü bu dönemde yaşanan olaylar, Müslümanlara ikili bir eğitim mirası bırakmıştır. Bu ikili eğitim türü kişide, ailede, toplumda ve çevrede uyumsuzluklara yol açmıştır. Bunun yanında postmodern yönelimler, çözüm olarak geleneksel olmayan alternatifler noktasında fırsatlar yaratmaktadır. Bu makale, Kur’ani dünya görüşü ile doğa bilimlerini bütünleştirmenin başlıca gerekçelerini ortaya koymaktadır. Kur’ani dünya görüşünün temel unsurlarının doğaya yönelik çalışmalarla ilişkisine temas eden makale, özellikle Allah’ın iki kitabının (Kur’an ve Kâinat Kitabı) “okunması” kavramı yanında, insanlığın kendisi, kainat ve Allah ile olan ilişkisine yoğunlaşmaktadır. Bu makalede kısaca, doğa bilimlerinin mevcut zeminini oluşturan çağdaş dünya görüşleri, bunların yol açtığı günümüz dünyasının çevre ve insani krizleri ve bu krizler karşısında uzmanların tepkileri tartışılmaktadır. Makale, doğa bilimleri incelemesi noktasında Gazali’nin, Kur’an’ın kalp ve ulül-elbâb kavramlarına dayalı şekilde geliştirdiği söylem ve uyum yönteminden hareketle oluşturulmuş bir entegre model önermektedir. Bu entegre model, doğa bilimlerinin bazı yönlerinin Kur’ani dünya görüşüyle organik biçimde aşlanmış, ihtiyatlı ama bütüncül bir yeniden yerleştirilmiş, yorumlanmış ve uyumlanmış İslami eğitimin ortaöğretim aşamasında uygulanmasına yöneliktir. Bu tür bir uyumlulaştırmanın, uzun vadede Müslüman bireyin ve ümmetin içinde anlaşmazlıkları ve uyumsuzlukları giderebileceğine, bunun yanında genel olarak insanlık ve onun meskûn olduğu çevre için de sürdürülebilir bir iyiliği ortaya koyacağına inanılmaktadır.

**Anahtar Kelimeler**

Tavhid • Kur’ani dünya görüşü • Uyum • Doğa bilimleri • Batılı modern bilimi • Ulül-elbâb • Kalp

\* Bu metin, Talim: Journal of Education in Muslim Societies and Communities’te yayımlanan “Qur’anic Worldview and the Natural Sciences: An Ulü Al-Albâb Integration Framework for Islamic Secondary Schools” başlıklı makalenin genişletilmiş özetidir.

**Başvuru:** 15 Mart 2018 / **Kabul:** 20 Mayıs 2018 / **OnlineFirst:** 25 Haziran 2018

<sup>1</sup> Nur Jannah Hassan (Dr.), Department of Fundamental and Interdisciplinary Studies, Kulliyah of Islamic Revealed Knowledge & Human Sciences, IIUM, Malezya. Eposta: njhassan@iiu.edu.my

Müslümanların eğitimde entegrasyon meselesi, Müslüman ümmeti ikili bir eğitim mirasıyla baş başa bırakan sömürge sonrası dönemden beri önemli bir sorun olmuştur. İçsel zayıflıklar, sömürgeleştirme, modernizm ve postmodernizm; benlik, aile, toplum ve çevrede uyumsuzluklar getirmiştir. Fakat post-modern eğilimler, çözüm olarak geleneksel olmayan alternatifler için fırsatlar yaratmaktadır. Ulus inşasında bilim ve teknolojinin yeri tartışılmazdır. Sağlıklı bilimsel kültür, bilimsel kavrayış ve üretkenlik, özgün ve rekabetçi teknolojik gelişmeler olmaksızın herhangi bir ulus, küresel güçlerin manipülasyonları altında tüketici olarak kalacaktır. Daha geniş bir ölçekte, sağlam bir bilimsel kültür Tanrı inancı ve dinamik Müslüman ümmetin kültürü (*ethos*) olmalıdır. Bu, Kur'an'ın *Ülū al-Albāb* olarak nitelendirdiği [derin düşünce ve kavrayış sahibi] kişilerin arasında olduğu bir kültürdür. Onların bilim, teknoloji ve özellikle felsefi öncüllerinin doğasının insanlık üzerindeki etkisine tanıklık eder. Bu genç Müslümanlar, ümmetin kaderi onlarla belirleneceği için Kur'an'ın yaşayan dünya görüşüne dayanarak inançlarını ve bilimsel zekâlarının gücünü geliştirirler.

Daha entegre bir eğitim ve İslami bilimi ihtiyacı üzerine tartışan çalışmaların bolluğuna rağmen, mevcut çalışmalara ilişkin kapsamlı incelememiz, Kuran dünya görüşünün unsurlarının ortaokul doğa bilimleri müfredatıyla bütünleştirilmesi alanında kayda değer çalışmaların eksikliğini göstermiştir. 2010 ve 2013 yılları arası dönemde Malezya'da on iki, Endonezya'da on iki, Güney Tayland'da beş ve Brunei, Singapur, Mindanao ve Kanada Ontario'da en az birer İslami ortaokulu ziyaret ettik. Gözlemlerimiz ve ziyaret ettiğimiz okulların öğretmenleri, yönetim kurulu üyeleri, öğrencileri ve velileriyle yaptığımız mülakatların yanı sıra ziyaret edilen okullardan toplanan çok sayıda müfredat, ders içeriği ve (2002 ile 2015 arasında Birleşik Krallık'ta ve adı geçen ülkelerde Malayca, Endonezyaca, Taylandca ve İngilizce basılan) ders kitaplarının analizleri; doğa bilimlerinin öğretim ve öğrenim süreçleri veya ilgili müfredat, ders içeriği ve der kitapları herhangi bir entegrasyon hakkında çok az şey göstermektedir. Ortaokulların doğal bilim müfredatı ve dolaşımdaki ders kitapları; natüralizm-mekanizm-pozitivizmin Tanrı'yı doğa, insan ve evrenin çalışma düzeninden dışlayan geleneksel modern Batılı modeline dayanmaktadır.

Bu makalede, doğa bilimini Kuran'ın dünya görüşü ile bütünleştirmek için kısaca dört temel gerekçe sunulmaktadır: (a) Kuran'daki muhkem emirler, (b) modern bilimin çoğu anti-teolojik alana ilişkin olan öncülleriyle ilgili bilgisizlik, (c) modern bilimin natüralist, mekanistik ve pozitivist doğası ve bunun Batılı eleştirileri, (d) insanlığın ve doğrudan ya da dolaylı olarak bu bilimin sonucu olarak ortaya çıkan çevrenin çağdaş durumu. Makale doğa araştırmalarıyla ilişkili olarak Kuran'ın dünya görüşünün temel unsurlarına temas etmektedir; özellikle de iki kitaptaki, yani Kur'an'daki ve açık kitap olan Kâinattaki ayetlerin [*Āyāt, Signs*] okunması kavrayışına ve bu kavrayış çabasında duyu ile aklın konumuna. Özellikle ayrıntılandırılmamış olmasına rağmen, Kur'ani metafizik, teoloji, kozmoloji, antropoloji, ontoloji, epistemoloji, teleoloji,

aksiyoloji ve eskatoloji tartışmalardan çıkarsanabilir. Buna insanlığın kulluğu [*ubūdiyyah, servitude*] ve hilafeti [*khilāfah, vicegerency*] ile Allah'ın idaresi [*Tadbīr, administration*], önceden belirleme ve düzenlemesi [*Taqdīr, pre-determination and regulation*] ve kainatı kontrol etmesi [*Taskhīr, subjection*] kavramları dâhildir.

Teistik bir çözüm ihtiyacı, bir dizi Müslüman ve gayrimüslim çağdaş âlim ve kanaat önderi tarafından dile getirilmiştir. Makale, bu isimler arasından Müslümanları ve Hristiyanları göreve çağıran Hans Küng'e gönderme yapıyor. Modern Batılı bilim üzerine yapılan ileriki tartışmalarda ise makale, düzeltme, yeniden yorumlama ve/veya uyumlulaştırmaya ihtiyaç duyan birkaç meseleyi kısaca tartışıyor. Bunlardan en önemlisi modern bilimin Tanrı'dan kopmasıdır, daha doğrusu tevhidi Tanrı kavramından [*Tawhīdic, uncompromising absolute Oneness*] –ki bu kavram, yaratılmamış ve yok edilemez madde ve enerji, yaratılışın doğası ve insan doğası gibi diğer bütün tartışmalı meselelerin anahtarı olarak düşünülür. İncelenen konular arasında dünya ve insanlığın dünyevi görevlerinin yanı sıra bilimin değer-bağımsız ve ahlak-bağımsız olduğuna ilişkin varsayımsal uyuşma, günümüz dünyasında ortaya çıkan çevresel ve insani krizler ve bu krizlerle yüzleşen uzmanların cevapları bulunmaktadır.

Bu makalede, İslami ortaöğretimde kullanılmak üzere Kuran'daki akıl sahipleri [*ülū al-albāb*] kavramına dayalı doğa bilimi öğretim ve öğrenimi için uyumlulaştırılmış bir Kur'ânî model sunulmaktadır. Burada Kur'an'ın dünya görüşü açısından ve onunla organik bağa sahip olarak doğa bilimlerinin belirli yönleri ihtiyatlı fakat bütüncül bir şekilde yeniden konumlandırılmış, yeniden yorumlanmış ve uyumlulaştırılmıştır. Makalenin fiziksel sınırlılıkları yukarıdaki hususların kapsamlı olarak sunulmasını engellemesine rağmen bazılarını kısaca değinilmektedir. Makale, böyle bir metodolojinin tamamen yeni olmadığını da göstermektedir. Aksine bütüncül yeniden konumlandırma, yeniden yorumlama ve uyumlulaştırma; daha önceki Müslümanların antik eserleri çalışıp Kur'an ölçülerine göre alımlarken ve İslam medeniyetinin görkemli sayfalarından biri olan büyük bir Kur'ani bilim kültürünün başarılı bir şekilde geliştirirken yaptığı ve başardığı şeyin çağdaş bir versiyonudur. Makale uyumlulaştırma girişimlerinde hatalı olduğu düşünülen bölük pörçük popüler metodolojilere karşı uyarıda bulunmaktadır. Yukarıdaki modelin inşasına dahil edilenler, Gazâlî'nin bütünleştirici metodolojisi ve kalp [*qalb, spiritual heart*] hakkındaki söylemidir. İkincisi ise ruh [*rūh, spirit*], benlik [*nafs, self*], akıl [*'aql, intelligence*] ve kalbin [*qalb*] organik sinerjisinden oluşan manevi bir varlıktır. Gazâlî, bilginin edinilmesinde, hakikatin açığa çıkarılmasında ve eylemlerin değerinin ve yörüngesinin belirlenmesinde kalbe merkezi bir paye vermiştir. Bu nedenle kalp arındırılmalıdır [*purified*].

Bu makale, akıl sahipleri ve kalbin safiyeti nosyonlarını, doğa bilimi Kur'an'ın dünya görüşü ile bütünleştirmek üzere bir çatı altında buluşturmaktadır. Bu çatı, (a) tanımlama, (b) arındırma ve (c) güzelleştirme ve zenginleştirme olmak üzere üç

aşamalı bir metodoloji uygular. Çatı üç boyutlu bir yapıdan oluşur: (I) Kapsayıcı ilkeyi oluşturan Kuran'ın Dünya Görüşü [*Al-Taşawwur al-Qur'anī*], (II) İslam Medeniyet Mirası ve Bilgi Geleneği [*al-Turāth al-'Ilm fī al-Islām*] ve (III) Kuran'ın doğa bilimleri araştırmalarına uygunluğunu ve tersini göstermek [*al-Mulā'imah*]. Bu çatı ayrıca insanlığın üç katmanlı ilişkisi üzerine inşa edilmiştir: insanlığın Allah ile ilişkisi [*ḥabl min Allāh*], insanlığın kendisiyle ilişki [*ḥabl min al-nās*] ve insanlığın kainat ile ilişkisi [*ḥabl min al-kawn*]. Bu tür bir bütünleşmenin; sadece Müslümanlar ve ümmet arasında değil, genel olarak sürekli iyilik getireceği için aynı zamanda insanlık ve çevre için çatışmaların ve uyumsuzluğun üstesinden gelebileceğine ve uzun vadede dengeyi yeniden kuracağına inanılmaktadır. Makale, özellikle İslami ortaöğretim okulları için üç ciltlik bir biyoloji, kimya ve fizik referans metni yayınlayan Kuran'ın Dünya Görüşü'nden Doğa Bilimi Projesi'nden bahsederek son bulmaktadır; M. Kamal Hassan (chief editor), *Natural Science from The Worldview of The Qur'an: An Introduction*, (Kuala Lumpur: ITBM, 2018) söz konusu konularda geleneksel metinleri desteklemektedir.

**Research Article**

# Qur'anic Worldview and the Natural Sciences: An *Ūlū Al-Albāb* Integration Framework for Islamic Secondary Schools

Nur Jannah Hassan<sup>1</sup>**Abstract**

For the Muslim ummah, the issue of integration in education has been a major concern since the post-colonial period, as the events that transpired during this period left Muslims with the legacy of a dichotomous education. In turn, this type of education results in disharmonies in the person, family, society and the environment. Yet post-modern trends are opening up opportunities for non-conventional alternatives as solutions. This article presents the major rationales for integrating the Qur'anic worldview and the natural sciences. It touches upon the fundamental elements of the Qur'anic worldview in relation to the studies of nature, specifically the notion of “reading” the two Books of Allah (i.e. al-Qur'ān and the Open Book of the Cosmos) as well as humanity's relation with Allah, with itself and with the cosmos. This article briefly discusses the worldviews that have brought about the natural sciences to their current pedestal, the ensuing environmental and humanitarian crises of the contemporary world, and experts' responses in the face of these crises. It puts forward an integrated model for the study of the natural sciences based on a synthesis of al-Ghazālī's methodology of integration and discourse on the qalb, and the *Ūlū al-Albāb* notion of the Qur'an. The integrated model is for use in Islamic secondary education, where certain aspects of the natural sciences undergo a discreet but holistic reposition, reinterpretation and reorientation from the framework of, and organically infused with the Qur'anic worldview. It is believed that such integration is able to address the conflicts and disharmonies, and in the long run restore the equilibrium, not just within the Muslim person and the ummah but also to bring about sustained goodness for humanity in general and the environments in which they reside.

**Keywords**Tawhīd • Qur'anic worldview • Integration • Natural science • Western modern science • *Ūlū'l-albāb* • Qalb

**1 Correspondence to:** Nur Jannah Hassan (PhD), Department of Fundamental and Interdisciplinary Studies, Kulliyah of Islamic Revealed Knowledge & Human Sciences, IIUM. Email: njhassan@iium.edu.my

**To cite this article:** Jannah Hassan, N. (2018). Qur'anic worldview and the natural sciences: An *ūlū al-albāb* integration framework for Islamic secondary schools. *Talim: Journal of Education in Muslim Societies and Communities*, 2, 23–52. <https://dx.doi.org/10.12738/talim.2018.1.0103>

The place of science and technology in nation building is indisputable. A nation without a sound scientific culture and understanding, wanting in the proliferation of science, and lacking original and competitive developments in technology will forever remain a consumer, thereby jeopardizing the sovereignty of her mind, spirit, culture, education, ethics, economy, politics, governance and territory and leaving her at the mercy of manipulations by the world's powers that be. Beyond nationhood and on a wider *ummatic* scale, a sound scientific culture must be the ethos of a God conscious and dynamic Muslim *ummah* [global community], vis-à-vis the culture inherent among those that al-Qur'an addresses as *Ūlū al-Albāb*, without which, the *ummah* may forever subject herself to "*colonisabilité*" (Malik Bennabi, 2003). The annals of humanity are witnesses to the impacts that science and technology have had on humanity. An examination of the Islamic, the modern and the post-modern eras illustrates the magnitude that the philosophical premises on which science and technology are pursued, the impact of the type of science education and the technological *savoir-faire* have on the young. It is vital that Muslims develop vigorous scientific young minds and consciences based on the Qur'anic worldview, as the future lies in their hands. If Islamic education is to be key in securing a future Muslim *ummah* that is Islamically vibrant, then it is this factor that is most crucial. Such is the *ummah* that is well-equipped to not only sustain herself, but also to rise above the challenges of globalisation, capable of upholding her responsibility as the bearer of the Qur'anic message and in presenting to the world workable alternatives and solutions based on the Qur'anic worldview that spreads mercy to all (Q. 21:106-107).

Despite the plethora of works deliberating on Islamic / *Tawhīdic* / Qur'anic science and on the need for a more integrated education, our extensive review of available works has uncovered only a very small number of studies that specifically deliberate on actually integrating elements of the Qur'anic perspectives (or anything to this effect) into the curricula implemented in Islamic secondary schools. It is surprising that this very small number is particularly more wanting in integrating Qur'anic perspectives into secondary school curricula of the natural sciences notwithstanding the great number of Islamic secondary schools declaring themselves as integrated.

Our observations and interviews with teachers, board members, students and parents of the schools that we visited between 2010 and 2013 in Malaysia (12), Indonesia (12), Southern Thailand (5), and in Brunei, Singapore, Mindanao and Ontario, Canada; as well as our analyses of the large number of curricula, syllabi and textbooks (in Malay, Indonesian, Thai and English, published in the said countries and in the U.K. between 2002 and 2015) gathered from the schools show the following. There was very little integration happening, if any, (a) in the teaching and learning processes, and (b) in the curricula, syllabi and textbooks of natural science. Our findings may be described briefly as follows:

- (i) The lack of comprehensive knowledge on integration (why, what, when and how), time constraints, demands of the formal syllabi and examinations caused integration to be left to the devices of individual teachers or schools, or to be side-lined altogether.
- (ii) School administrators, teachers and a portion of the public undertook integration based on respective awareness and understandings, instead of formal institutionalisation in the curricula.
- (iii) Integration constituted the study of Islamic religious subjects and the natural sciences in parallel, with minimal intersection, if any.
- (iv) Integrated curriculum was limited to commendable observances of daily prayers, Qur'an recitation/memorization, supplications, etiquette, character development and co-curricular activities.
- (v) Lack of training for teachers. With little or no formal guidance or supervision, they were encouraged to improvise on their own, resulting in superficial patching-on of Qur'anic verses/ *ahādīth* [Prophetic traditions] in the teaching and learning processes.
- (vi) Stark lack of secondary school curricula, modules and textbooks of natural science used in the secondary schools visited written fully from the Qur'anic worldview.
- (vii) There was a dire need for such materials voiced by almost all teachers, administrators and members of the schools' boards.

By and large, the secondary school natural science curricula and textbooks in circulation were based on the conventional Western model of naturalism-mechanism-positivism, in which God and His attributes were left out from the study of nature, man and the universe. Some of the purported integrated materials found included a few Qur'anic verses and supplications in the opening, or at best, sparsely interspersed in the text, with little guidance or explained relevance.

This article presents an integration framework for the natural sciences, based on a synthesis of al-Ghazālī's methodology of integration and discourse on the *qalb* [spiritual heart] and the Qur'anic notion of "*Ūlū al-Albāb*" [those endowed with refined intellect and insight]. Certain conventional aspects of the natural sciences undergo holistic reposition, reinterpretation and reorientation from the Qur'anic worldview, whereby humanity's relationship with God, with itself and with the cosmos form the main constructs.

## The Rationales

There are several rationales that call for integrating the Qur’anic Worldview with the natural sciences. The following are four main rationales.

### **Qur’anic Injunction**

Al-Qur’an draws attention to “read” the revealed “*Āyāt*” [“Signs”] in the two Books of Allah: al-Qur’an and the cosmos. The cosmos is to be read, studied, pondered, contemplated, understood and reflected upon in the light of the Qur’an. This signifies the importance and rightful position of reason, in its subservience to Revelation. Reason is to submit to Allah, the Divine Intellect, Who authored both *Āyāt*.

Read! In the Name of thy Lord Who created. .... Read! And thy Lord is Most Bountiful. He Who taught (the use of) the pen. Taught man which he knew not..... bow down in adoration, and bring thyself the closer (to Allah)! (Q. *al-‘Alaq*, 96:1-19).

...Soon will We show them Our Signs in the (furthest) regions, and in their own souls, until it becomes manifest to them that this is the Truth. Is it not enough that thy Lord doth witness all things? (Q. *Fuṣṣilat*, 41:53).

Al-Qur’an repetitiously commands one to apply and bring to bear all the sensory and intellectual faculties to comprehend both categories of *Āyāt* with humility, gratitude, acknowledgement, awe and absolute reverence, obedience and servitude toward Allah – the One God, Who is also the Creator (*Al-Khāliq*), the Owner (*Al-Mālik*) and the Lord Sustainer of everything that exists (*Al-Rabb al-‘Ālamīn*). A compelling example is *al-Rūm*, 30:11-27, where Allah decrees upon humanity to awaken the senses and engage in a rational understanding of His *Āyāt* as do the *Ūlū al-Albāb*, addressed 16 times in the Qur’an (e.g. in *Āli-‘Imrān*, 3:189-190).

The necessity for integrating the rational sciences with revelation has been expressed by many, notably *Imām* al-Ghazālī (1058-1111), who managed to reconcile the three disparate post-Qur’anic thoughts of *fiqh* [jurisprudence], *kalām* [scholasticism] and *taṣawwuf* [the esoteric dimension] into one cohesive whole. Through classifying knowledge and its acquisition, al-Ghazālī reinstated the rightful position of human intellect with respect to the primacy of Revelation. Bediuzzaman Sa‘id Nursi (1877-1963) gives a beautiful analogy:

The religious sciences are the light of the conscience, and the modern sciences are the light of the reason. The truth becomes manifest through the combining of the two. The students’ endeavour will take flight on these two wings. When they are separated it gives rise to bigotry in the one, and wiles and scepticism in the other (as cited in Şükran Vahide, 2011, p. 53).



Fazl-ul-Rahman Ansari (2008, p. 180) describes:

[T]he Holy Qur'an chartered a new course for the pursuers of science; and in that its function was to stimulate the scientific outlook and the quest for scientific knowledge, and to promote the cultivation of the physical sciences;—and that to an extent that the Scientific Quest has been made a part of the Worship of God, having been affirmed as an inseparable complimentary of the Religious Quest....

Ismā'il Rājī Al Fārūqī's (1921-1986) message on *Tawhīd* [the absolute Oneness of God] has been articulated distinctively throughout his work. He stresses,

Islam called everyone to be a scientist investigating every field and aspect of nature; a historian examining every chapter of human and group behavior through the centuries (Al Fārūqī, 1986, p. 321).

He adds, nature “was not created in vain or sport” but with a “divine purpose”, not for man “to possess or to destroy” but as a “*ni'mah*” and “*āyah*”. It is “God’s work”, an “instrument of His purpose”, thus its “tremendous dignity”, requiring our “respect and awe” (al Fārūqī, 1986, pp. 321–323).

### **The Reality**

“What is the problem with [modern] science?” “What is so ‘un-Islamic’ about [modern] science?” “There is not such a thing as Islamic science or un-Islamic science!” “Science is science, it is objective and it is already ‘Islamic’ ” “Don’t tell me that what we are doing in science is not Islamic!” These are usually the responses, whenever discussions on Islamicising science or the integration of science and *Tawhīd* are brought up. These responses shrewdly summarise the thinking of many Muslims, irrespective of their education and social backgrounds. This thinking results from the indoctrination of the purported objectivity of science in education and scientific practise. Furthermore, the deficiency of exposure to the history and the philosophy of science has led to the above misunderstanding’s becoming so widespread. An examination of the history and philosophy of the Western modern science clearly shows that science is far from being objective. It is laden with the pre-suppositions of the worldview that lays out the discipline. Fundamental questions such as “Who am I?”, “Where do I come from?”, “Why am I here?”, “What is the meaning of life?” all bear their weight in the foundation and trajectory of any system or discipline.

### **Western Voices on Modern (Naturalistic, Mechanistic and Positivist) Science**

Naturalism assumes that “nature is governed by objective laws”, “understood through observation and experimentation without recourse to super-natural or extra-natural reality”. It “implies that all knowledge of the universe can be arrived at through scientific investigation”. Anything with the label “supernatural [...is...] either non-existent,

unknowable, or not inherently different from natural phenomena or hypotheses” (*The New World Encyclopedia*, December 2014). Mechanistic philosophy is attributable to materialism. It holds that the universe “is best understood as a completely mechanical system”, i.e. “a system composed entirely of matter in motion under a complete and regular system of laws of nature”. Mechanists strive to explain “every phenomenon in the universe [...] in terms of mechanical laws”. It is “often criticised for overlooking the organic interdependent relationships [...], its incompatibility with free will, and oversimplification of complex phenomena” (*The New World Encyclopedia*, n.d.). Positivism describes a system as a set of experiential data, with the repudiation and exclusion of any metaphysical presupposition. It refutes transcendence and is “antitheological”, where “[m]ost positivists have been utilitarians” with the “object of worship not the deity of the monotheistic faiths but humanity”, rendering it “anthropomorphic” (*The Academic Edition of Encyclopaedia Britannica*, n.d.).

Western modern science as we know it today, has developed on the premises of all three philosophies, which exude from the fundamentals of secularism. Karl R. Popper (1994, pp. 82–83) explains,

The history of science, even of modern science since the Renaissance, and especially since Francis Bacon [1561-1626], may be taken as an illustration. [...] Bacon was the prophet of the secularized religion of science. He replaced ‘God’ by the name ‘Nature’ [...]. Theology, the science of God, was replaced by the science of Nature. The laws of God were replaced by the laws of Nature. God’s power was replaced by the forces of Nature. And at a later date, God’s design and God’s judgements were replaced by natural selection. Theological determinism was replaced by scientific determinism, and the book of fate by the predictability of Nature. In short, God’s omnipotence and omniscience were replaced by the omnipotence and omniscience of nature and by the virtual omniscience of natural science.

In *Novum Organum Scientiarum* (*The New Organon*) first published in 1620, Bacon prescribes the “purging” (Bacon, 2000, p. 12) of the mind of all prejudices and theories, which he calls as the “idols” of religion, history, philosophy, education and tradition (Bacon, 2000, pp. 18–23). He prescribes that “Man is Nature’s agent and interpreter” and that “Human knowledge and human power come to the same thing” (Bacon, 2000, p. 33). He insists,

We can only count three periods which were high points of learning: one among the Greeks, the second among the Romans, and the last among us, that is to say, the western nations of Europe [...]. There is no reason to mention the Arabs or the scholastics, whose numerous treatises [...] wore the sciences down than increased their weight (Bacon, 2000, p. 64).

Richard Tarnas (1991, pp. 282–283) accounts,

This emergence of the modern mind, rooted in the rebellion against the medieval Church and the ancient authorities, and yet dependent upon and developing from both these matrices, took the three distinct and dialectically related forms of the Renaissance, the Reformation, and the Scientific Revolution. These collectively ended the cultural hegemony of the Catholic Church in Europe and established the more individualistic, sceptical, and secular spirit of the modern age. Out of that profound cultural transformation, [modern] science emerged as the West's new faith [...] Science ennobled that [modern] mind, showing it to be capable of directly comprehending the rational order of nature [...] No [...] such authority needed, for every individual possessed within himself the means for attaining certain knowledge—his own reason and his observation of the empirical world.

This rootedness, rebellion and dependence upon the medieval Church and ancient Hellenistic authorities are referred to as the “hidden continuities” of the Western mind (Tarnas, 1991, pp. 320–323).

Introducing historicism to modern science, Thomas S. Kuhn (1996, pp. 1–4) argues,

If science is the constellation of facts, theories, and methods collected [...], then scientists are men who, successfully or not, have striven to contribute one or another element to that particular constellation [...]. An apparently arbitrary element, compounded of personal and historical accident, is always a formative ingredient of the beliefs espoused by a given scientific community at a given time. That element of arbitrariness does not, however, indicate that any scientific group could practice its trade without some set of received beliefs.

On the “objectivity” of science, Tarnas (1991, p. 359) notes,

[B]ecause scientific knowledge is a product of human interpretive structures that are themselves relative, variable, and creatively employed [...], the truths of science are neither absolute nor unequivocally objective. [...] the modern mind was left free of absolutes, but also disconcertingly free of any solid ground.

In addition, Stephen Hawking declared the death of philosophy (2010, p. 5) and that

God... is not the answer of modern science [...] just as Darwin and Wallace explained how the apparently miraculous design of living forms could appear without intervention by a supreme being, the multiverse concept can explain the fine-tuning of physical law without the need of a benevolent creator... (Hawking, 2010, pp. 164–165).

It has to be acknowledged that there is a small yet significant group of contemporary western scientists who subscribe to theistic science. A former atheist (Collins, 2006, p. 16) Collins (former head, U.S. National Human Genome Research Institute) became convinced of his faith in God through his involvement and leadership in the sequencing of the human genome project, which he describes as “both a stunning scientific achievement and an occasion of worship”. Collins (2006, p. 3) argues, “belief in God can be an entirely rational choice, and that the principles of faith are, in fact, complementary with the principles of science”.

## **The Environment and Humanity**

It is agreed upon that since the modern period, humanity and the environment have been subjected to a record overabundance of crises. These result from human activities, related directly or indirectly to science and technology. Humans exploit, ravage and pollute the earth, and amass piles of garbage on its surface. The plastic garbage patch in the Pacific Ocean (Kaplan, 2016; Ocean Portal, 2015) twice the size of France (Grant, 2009) just shows that earth is suffocating from plastics, endangering and killing marine flora and fauna, and contaminating the food chain. For progress, show of status, economic advancement and political brute, humans pillage the earth and violate other humans, animals, plants and inanimate components of the earth without guilt. The widening ozone hole, global warming and extreme weather conditions are some of the outcomes of human induced climate change. Out of the glut, humans subject themselves to unparalleled miseries resulting from environmental, social, physical, intellectual, emotional and psychological pollutions, and the loss of humanity's soul and spirit. Hans Küng (2007, pp. 649–650) writes,

The price that the West had to pay for the [...] epoch-making change in values and norms [...] of late-modernity [...] was a high one: the other spheres of life were left with no religions and indeed largely also with no moral basis and ultimate horizon of meaning [...]. From this follows a deep crisis of orientation and [...] a desperate search for meaning, criteria and a shared basis for values. Like absolutized faith, so too absolutized reason can set free destructive energies, with devastating effects [...]

He continues, “Here is a new task for Muslims and Christians together” (Küng, 2007, p. 650).

## **Western Modern Science: Some Aspects in Need of Correction, Reposition, Reinterpretation and Reorientation**

The history and philosophy of Western modern science clearly shows that science is far from being objective, but is laden with the underlying presuppositions of the worldviews that construct the discipline (Bakar, 2008; Hassan, 1980, 1981; Kuhn, 1996; Nasr, 2003; Tarnas, 1991). These worldviews came about in response to historical circumstances – pre-modern, modern, and continue to contemporary post-modern era. The presuppositions seep through as “hidden continuities” of the Western mind (Tarnas, 1991, pp. 320–323), and can be detected from several glaring issues.

Of primacy is science's detachment from God and the transcendent. Instead, reason, material and mathematical empiricism are put in His place, as human reason becomes the only authority. Losing all sensibility of the sacrosanct, everything else in the universe, including fellow humans, can become object of scientific investigation (Alexander & Numbers, 2010). Charles Darwin's theory of evolution, natural selection and survival of the fittest are considered as trademarks of the ‘natural

history' of human beings. No longer the slave-servants and vicegerents of Allah in Islam, or the children of God in the Judeo-Christian tradition, Darwinian men are a product of the random, mechanistic and purposeless process of nature. These are the highest form of *kufir* [denial], *khiyānah* [treason], *al-fasād* [corruptions] and *al-zulm* [injustices] towards Allah, all of which beget further transgressions.

Next, a number of notions held as contemporary scientific convention (“the Ten Dogmas of Modern Science” in Sheldrake, 2012, pp. 6–12) seem too familiar with ancient Hellenistic cosmology, some of which are inherent in the old Christian dogma (see Dewitt, 2004, pp. 4–9; Motley, n.d.). Everything in the universe – inclusive of humans, their inner workings and laws of nature – is *mechanically self-perpetuating and fixed* (vis-à-vis Aristotelian deistic notion of God). Matter and energy are neither created nor destroyed, with the total amount a constant since the beginning of time (re: Aristotelian notion of God Who formed the universe from *matter that is already in existence*, since nothing can come out *ex-nihilo*). There is no transcendental metaphysical value in human earthly life. The Aristotelian man is the “rational animal” of the geocentric earth. The Christianised Aristotelian notion of life is only to *escape* upon death *from the wretched hell at the core of earth* in order to ascend to higher geocentric celestial levels and toward heaven. In Darwinian terms, humans are a chance-product of natural selection, the purposeless mechanism of evolution. Hence with respect to the size of the cosmos, humans are utterly insignificant. Similarly, the earth has no transcendental significance. As the earth is irreversibly imperilled, the great scientific quest is to find other planets with signs of biological life as humans' new abode (re: Christianized Aristotelian geocentricism – *the only significance of the earth is that of a place of punishment for sinners*, with no moral obligation of custodianship onto it.) This sophisticated-*escapism* is at the expense of billions of precious dollars that could have sufficiently alleviated the sufferings of the homeless and starvation afflicting millions.

Another issue is as Bernard E. Rollin (2006, p. 17) confides in his book *Science and Ethics*:

The slogan that I in fact learned in my science courses in the 1960s, and which has persisted to the present, is that “science is value-free” in general, and “ethics-free” in particular.

He contends

Clearly, then, the component of scientific ideology that affirms that science is value-free and ethics-free is incorrect. We can also see that the more fundamental claim – that science rests only on facts and includes only what is testable – is also badly wrong. How, for example, can one scientifically prove (i.e., empirically test) the claim that only the verifiable may be admitted into science? (Rollin, 2006, p. 27)

Rollin (2006, p. 29) continues,

Another component of scientific ideology [...] is the ubiquitous belief that we best understand any phenomenon when we have understood it at the level of physics and chemistry, ideally, physics. [...] The language of physics is, after all, mathematics; yet ethical questions seem inexpressible in mathematical terms. [...] This reductionist approach further removes scientists from consideration of ethics. [...] Thus, many scientists lack a grasp of the way in which cultural factors, values, and even ethics shape the acceptance and rejection of whole fields of study (e.g., consciousness, [...] eugenics, intelligence, race, psychiatry as a medical discipline, and so on).

The defects in Western modern science as they exist today, developed on the premises of secularism, agnosticism, naturalism, mechanism, positivism, reductionism and capitalism (Bakar, 2008; Hassan, 1980, 1981; Küng, 2007; Nasr, 2003; Tarnas, 1991). We believe that reconciling truncated scientific concepts to Islamic creed, tenets and norms to be an apologetic approach that potentially will only deepen conflicts, imbalance and disharmony. Rather, a critical approach should include the deconstruction of the Western epistemology, and the reconstruction of an Islamic epistemology through a critical re-cultivation of the Islamic scientific tradition. Thus the curricula of the natural sciences should also include the assumption that science is not neutral and value-free. The ultimate purpose of science in Islam is to “read” God’s signs so as to be able to arrive at their true meanings, ultimately to increase one’s faith and closeness to Him (Bakar, 2008; Golshani, 1989; Hassan, 2017; Kartanegara, 2008). The pursuit of science not for the sake of fame, fortune or merely for the sake of science as conventionally defined, as Yūsuf ‘Alī (1992, p. 313) comments, “who did not stop short at the wonders of nature”, but penetrated “from nature up to nature’s God”. Science from the worldview of al-Qur’an is therefore in line with the holistic reality - spiritual, psychological, physical, emotional, intellectual and social - of the innate, uncorrupted human nature and the fundamental tenets of Islam, and should wholeheartedly reinforce *Tawhīdic* principles (al-Attas, 1989; Al Fārūqī, 1982; Al Fārūqī & Al Fārūqī, 1986; Bakar, 2008; Hassan, 2017; Iqbal, 2009).

### **A Qur’anic Integration Framework**

Throughout history, science went through a number of important interconnected processes. “Naturalisation” of science is the “adaptation or acculturation” of a foreign science to a particular new culture, resulting in the full assimilation of the discipline in the new society as part of its indigenous culture and philosophical system. This explains the nature of science, which is “culturally and ideologically laden”, instead of neutral and value-free. “Secularization” of science happens when its views, activities, theories and methods are stripped from any spiritual-metaphysical dimensions, as happened in the post-Renaissance, modern Western world. “Islamisation” of science is a naturalisation of the Western modern science into the Islamic value system and

foundation of civilisation (Kartanegara, 2008, pp. 149–163). It is the contemporary effort at reconstructing and reviving science in accordance to the Qur'anic worldview, as was also the case on the onset of Islamic civilisation. The bearing of Ya'qūb ibn Ishāq al-Kindī, the 9<sup>th</sup> century Muslim philosopher-scientist can be taken to illustrate.

Although Al-Kindi was influenced by the work of Aristotle [...], he put the Greek's ideas in a new context and laid the foundations of a new philosophy. He first elaborated a system of thought based on the logic of Greek philosophy, hence developed logic and systematic explanations for some of the debated theological issues of his time, such as creation, immortality, God's knowledge, and prophecy (as cited in Atiyeh, 1966, p. 127).

S.A. Ashraf (1990:2) asserts,

The philosophy of the Islamic past must be studied in order to see how Muslim philosophers tried to Islamise Greek philosophy, how far they succeeded and how far they failed and why. What was the problem which compelled Ghazali to write [...] *Tahafut al Falasifa*?

While modern Western science serves the utilitarian - medical, economic and technological - needs of human life, the role of science in Islam must cover these – and more. It is to discover and study the Signs of Allah in nature and to utilise all the resultant knowledge in serving His cause with gratitude, for the benefit of humanity's wellbeing in this world – and in the hereafter. The cosmos is to be observed, studied and contemplated upon, as a means to know the Creator and gain closeness to Him. Pursuing science is an *'ubūdiyyah* [servitude] toward Him, an aspect of *khilāfah* [vicegerency] (Bakar, 2008; Golshani, 1989) that advocates *'imārat al-kawn* [environmental prosperity] (see Q. 11:61). Al-Qur'an does not neglect anything relevant for the functioning of human life, which includes all the tools necessary for the cognition of nature (Golshani, 1989). These are hearing, sight and the heart; the perception of Divine Signs in nature through intellections and reflections, and prescriptions for studying nature through a careful study of the Book. The Qur'anic culture of knowledge acquisition had mobilised early believers to a myriad of activities that studied His creations, meant to facilitate people in their vicegerency and servitude toward God. Theirs was a Qur'anic scientific culture that enabled them to pinnacles of scientific advancements during the golden period of Islamic civilisation.

Science from the worldview of al-Qur'an is to be understood in the all-embracing *Tawhīdic* spirit with its comprehensive perspective of reality (Bakar, 2008). It is not simply attaching Qur'anic verses or *aḥādīth* [Prophetic traditions] to certain scientific concepts. Although popular, this “piece-meal validation” (Kartanegara, 2008, pp. 149–163) is not only inaccurate, but may risk contravening the very objectives of integration. We consider the “piece-meal” approach as faulty because it deconsecrates the Qur'an, subjecting Qur'anic Revelation to criterion set by empirical scientific data. As a product of human effort, science is contingent and not infallible. On the contrary, al-Qur'an as the

Final Revelation from Allah is objective, with no faults and contains the absolute Truth at all times. Associating verses of al-Qur'an or *aḥādīth* to current scientific findings places the sacred truth of Revelation at the scrutiny of shifting contingencies of science. It must be noted that the Medieval Church's staunch dogma on geocentrism, caused a row with Nicholai Copernicus (1543), *On the Revolutions of the Heavenly Bodies*. The Church decreed the Inquisition against Galileo Galilei (1632), which incriminated him for his position in favour of heliocentrism in *Dialogue on the Two Chief Systems of the World, Ptolemaic and Copernican* (Leveillee, 2011). The Church's dogmatic hold on geocentrism (once a valid position prior to further discoveries) resulted in the schism of Western science from religion, which has remained for almost four centuries. Muslim educators must be informed and take precautions against the above risk, and practice sharp acumen and probity in their integration efforts.

Natural science is a study of the *'ālam al-shahādah* [physical universe] that Allah created, as part of His *faḍā'il* [bounties] and *ni'ām* [blessings] to humans. It is necessary that this is conducted in subservience with the Creator's Words (e.g. Q. *Āl 'Imrān*, 3:190-191; *al-Jāthiyah*, 45:2-6). This epistemological unity is inherent in al-Qur'an, which is replete with mentions that Allah is the Ever-Aware Owner, the Creator that originates creation and then repeats it, the Sustainer, the Mighty, the Wise. These are followed or preceded by verses pointing to the wonders of His creations in the cosmos that serve as *Āyāt* [Signs] for those who use their faculties to reflect and understand. Al-Qur'an insists on the engagement of all the sensory and intellectual faculties in comprehending both categories of *Āyāt* – in the Qur'an and in the cosmos. Another gripping Qur'anic injunction is the notion of "*taskhīr*", which is the subjection of "*all that is in the heavens and all that is in the earth*" (Q. *al-Jāthiyah*, 45:2-6) for humans to harness, manage, safeguard and benefit from, in carrying out their duties as *'ibād Allāh* [slave-servants of Allah] and as His *khulafā' Allah fī al-ard* [vicegerents on earth] (Q. *al-Baqarah*, 2:30-34)—a "cosmic" vocation, in Al Fārūqī's (1986, p. 317) words, despite human's infinitesimal physical size.

Allah's administration of the cosmos (*Tadbīr al-kawn*, from "*yudabbiru*", Q. *Yūnus*, 10:3, 31; *al-Ra'd*, 13:2; *al-Sajdah*, 32:5) and His premeasurement, predetermination and decree ("*Taqdīr*" from "*qaddara*", Q. *Yūnus*, 10:2, 5; *al-Furqān*, 25:2; *Fuṣṣilat*, 41:10; *al-Muzammil*, 73:20; *'Abasa*, 80:19 & *al-A'lā*, 87:3) set the regularities, constancies and predictability of nature. In this regard, scientific laws are scientific statements that attempt to describe, insofar as science has reached, particular fixed patterns in nature in accordance to Allah's *Tadbīr* [Regulation] and His *Taqdīr* [Laws, predetermination] as He has decreed to operate in the physical universe. However, due to the contingency of science, certain established scientific theories (or perhaps even scientific laws) may be proven null in the future. Moreover, Allah, by His Absolute Power and Dominion, is capable to decree upon miracles (mostly as *al-mu'jizāt al-nabawiyah* or prophetic miracles) that are totally out of the norm or the expected



regularity in nature, and is thus scientifically inexplicable. Outside the domain of science also is the ‘*ālam al-ghayb* [unseen realm] of the cosmos, such as the nature of *rūh* [spirit], *nafs* [self], ‘*aql* [intelligence] and *qalb* [spiritual heart].

The cosmos must be studied with humility, gratitude, acknowledgement, awe and utmost reverence, obedience and servitude toward Allah, the God, the Creator, the Owner and the Lord of everything that exists. The endeavour must be pursued in the Light of the Qur’an as *al-Hudā* [the Guidance] and *al-Furqān* [the Criterion]. Excluding God from the disciplines of the natural sciences and pursuing them with attitudes contrary to the above constitute as grave injustices and transgressions against the innate nature of the human self, the cosmos – the environment, floras and faunas, the inanimate constituents, and the outer space – and are the gravest crimes against Allah, the Most Gracious.

### **Al-Ghazālī and the Importance of the *Qalb***

Al-Ghazālī considered knowledge of the natural sciences a necessity in comprehending the Qur’an. His re-emphasis on Theo-centricity integrates all matters of human existence—reconciling and re-integrating *fiqh* [jurisprudence], *kalām* [scholasticism] and *taṣawwuf* [the esoteric dimension], the three disparate post-Qur’anic thoughts, into an organic cohesion. Another significant aspect of his work vis-à-vis integration was his mastery of Hellenistic philosophy, which at the time had prevailed so much that its influence had affected Muslim intellectual figures, such as al-Farābī and Ibn Sinā. In *Tahāfut al-Falāsifah*, Al-Ghazālī filtered through and casted off the un-Islamic elements of Greek thought (al-Ghazālī, 1963, p. 3), purifying *kalām* from “heresy”. The notion of the “everlasting nature of the world, time and motion”; that God “does not know the non-particulars”; the “impossibility of a departure from the natural cause of events”; and the “denial of the resurrection of bodies” (al-Ghazālī, 1963, pp. 11–12) are among the twenty philosophical problems that he had identified and refuted. These arguments fundamentally disproved some of the conventional dogmas of modern science (see Rupert Sheldrake, 2013, pp. 6–27).

Al-Ghazālī’s emphasis on the state of the *qalb* [spiritual heart] in valuing human actions was a stark evidence of his careful attention on the integrated and holistic nature of humans. He realigned the spirit of ethics in line with humans’ *raison d’être*. His classification of knowledge and its acquisition reallocates the key position of reason in relation to the absolute ascendancy of uncorrupted Divine Revelation. Through all these, he brought to wakefulness, the transitory nature of earthly life and the eternal destiny; thus providing spiritual insights into the transcendence of the afterlife—giving a larger cosmological perspective to things.

Al-Ghazālī stressed on *tazkiyah* [purification] and *riyāḍiyyah* [exercising discipline] of the *qalb* (see Q. *al-Shams*, 91:7-10). In his terms, *qalb* (heart), *rūh*

(spirit), *nafs* (soul) and *‘aql* (intelligence) represent the four intrinsic faculties of the spiritual heart. Though each differs in meaning and is capable of bearing apparent outward expressions, all are intimately interrelated, constituting an organic whole (al-Ghazālī, 2009). To al-Ghazālī, intelligences (*‘uqūl*, “minds”, or “reasons”) are cognitive faculties of the spiritual heart, rather than solely of the brain. This can be traced to the Qur’an, e.g.

Do they not think deeply (earnestly seek to understand) the Qur’an, or are their hearts locked up by them? (Q. *Muḥammad*, 47:24)

Or do those in whose hearts is a disease, think that Allah will not bring to light all their rancour? (Q. 47:29)

The heart is the seat of knowledge (“*al-maḥall al-‘ilm*”)—a mirror that reflects signs that Allah placed in life (al-Ghazālī, 2009, pp. 39–40). So central is the heart that even in pursuing something intrinsically noble (“*maḥmūdah*”) may end up being despicable (“*maẓmūmah*”) if the deed originates from a “defective” or “diseased” heart. These may fall into 5 general conditions: “imperfection” due to immaturity; “dullness due to disobedience” and “lust”; miss-direction due to distractions of worldly matters; veiling due to pre-conceptions and blind imitations; and “ignorance of the direction from which the knowledge sought must be obtained” (al-Ghazālī, 2009, pp. 39–58). Hence, purity and clarity of the heart are necessary requisites for the unveiling of true knowledge.

Humanity is endowed with tools to derive awareness and knowledge. These are (i) *ḥawāss* [faculties of senses] and *‘aql* [reason], which despite their being deficient, allow humans to know the apparent universe that they reside in; and (ii) *naql* [Divine Revelation and inspiration], which enable them to discover what are not apparent by the former. The sources, methods or reliability of the two tools are by no means equal. The *qalb* [spiritual heart] has the “special properties of knowledge and will, which separates it from animals”. Spiritual maturity distinguishes it from immature inclinations (al-Ghazālī, 2009, pp. 23–24). The veils of true knowledge can only be lifted once the *qalb* has undergone *tazkiyat al-nafs* [purification of the soul] and has been self-cultivated through Qur’anic and *Sunnatic riḥāḍīyyat* [learning and exercising]. The highest purpose of knowledge is to enable one to become closer to Allah and eventually to the ultimate bliss of being in His presence (“*Wajh Allah*”, Q. *al-Baqarah*, 2:115, 272; *al-Rūm*, 30:38-39; *al-Mursalāt*, 76:9). Al-Ghazālī related true knowledge with happiness as such:

Clear understanding and clear intellect are the highest attributes of man, because through the intellect, the responsibility of Allah’s trust is accepted, and through it man can enjoy closeness to Allah (al-Ghazālī, 2013, p. 49).

Islamic education is to train and instill discipline to the sensory faculties (*al-ḥawāss*) and to develop the intellects (*al-‘uqūl*) to acquire the capacity to accumulate

knowledge through experiences. The ultimate is to enable the self to subdue the lower *nafs* (*al-ammārah bi al-sū'*) for the higher (*lawwāmah*, *al-muṭmainnah*). Training of *al-'uqūl* thus consists of disciplining both the physical and the spiritual faculties of senses (i.e. senses and sensibilities), which are inlets to the *qalb*. Al-Ghazālī's emphasis on exercising the faculties of *al-ḥawāss* and *al-'uqūl* is clear when he criticised against “*taqlīd*” [blind faith] rather than to investigation and personal observation (cited in Nofal, 1993, pp. 228–231).

The Qur'an states that the acceptance of worship is conditional upon purity of the *nafs* (Q. *al-Tawbah*, 9:19), soundness of the *qalb* (Q. *al-Tawbah*, 9:19) and humility of the spirit (Q. *al-Baqarah*, 2:45). These are attained through purifying the physical body and the *nafs*, *rūh*, *qalb* and *'aql* from any diseases that cast veils causing them to be bolted—blind, deaf, dumb—and dead. Likewise, a person is unable to unveil true knowledge without attending to his spiritual heart, purifying it and exercising his faculties in accordance to *al-Qur'an* and *al-Sunnah*. A person in the possession of *al-nafs al-ammārah bi al-sū'* may be skilled in scientific empiricals; but with a *qalb* that is blind, deaf, and dumb, he cannot reach into the true meaning of things. At best, his knowledge is good only for utilitarian disposes. The Qur'anic scientific attitude in the pursuit of true knowledge is characterised by the synergic equilibrium between purifying the self, exercising one's faculties and in engaging both the spiritual and the physical aspects of the self with *iqra'* (read[ings]), *dhikr* (remembrance) and *fikr* (thought).

### Ūlū al-Albāb

A contextual study on all the sixteen verses of al-Qur'an referring to *Ūlū al-Albāb* shows the following.

1. *Ūlū al-Albāb* are those with profound faculties of senses (*al-ḥawāss*) and intellects (*al-'uqūl*), so refined through *riyādiyyah* and *tazkiyah*, that their purified hearts receive impressions and colouration by Allah (*sibghat Allāh*, Q. *al-Baqarah*, 2:138).
2. This may be understood, as God is “his hearing with which he hears, his seeing with which he sees, his hands with which he strikes, and his foot with which he walks” (*ḥadīth qudsy* related by Bukhārī, on the authority of Abū Hurayrah r. 'a., *Ḥadīth 38, An-Nawawī's Forty Hadith*, 1976, p. 118).
3. Their hearts (*qulūb*) are epitomes of illumined reason and understanding, intelligent and discerning wisdom, and with insights that are able to draw conclusions through unveiling truth and correct guidance.
4. Al-Qur'an typifies them as wholly devoted in sincere and humble servitude (*'ubūdiyyah*) toward Allah, with lofty and refined Qur'anic-Prophetic spiritual ethics as exemplified by Muḥammad ṣ. 'a.w.

5. They exert their faculties in listening to, seeing, observing, thinking, pondering and contemplating upon Signs of *Allah* in al-Qur'an and in the cosmos to arrive at deep understanding of them both inductively and deductively.
6. They are steadfast in verifying their understanding through further empirical proofs and observations without superstition, baseless assumption and speculation or blind imitation.
7. With a deep sense of *taqwā* [awareness of God], *shukr* [gratitude], *tawāḍu'*, [humility] and execution of the highest form of *'ubūdiyyah* to Allah, they ceaselessly strive (*jihād*) in bringing themselves and others nearer to understanding His Signs, in knowing the Lord of the Universe (*ma'rifah*) and in becoming closer (*taqarrub*) to Him.
8. They exert themselves in selfless service to humanity through their responsibilities, profession, trade and craft to the best of their ability (*itqān*) and in the best manner possible (*ihsān*).
9. In so doing, they may emerge as scholars (*'ulamā'*) who, through a life of vicegerency (*khilāfah*), promote prosperity in nature (*'imārat al-kawn*) while safeguarding its sanctity of balance and spread mercy and goodness to all (*raḥmatan lī al-'ālamīn*). They are as what al-Qur'an addresses, "*Innamā yakhsha Allāha min 'ibādihī al-'ulamā'* – *Those truly fear Allah among His servants who have knowledge*" (Q. *Fāṭir*; 35:28).

In a very tight nutshell, constant *dhikr* [awareness and remembrance of] Allah and unfailing *fikr* [engagement of the mind in intellection], while continuously engaging in *iqra'* [reading, observing and contemplating] of God's creations – in the cosmos, in society, in human history and in the body – are the traits of the integrated personalities that al-Qur'an addresses favourably as *Ūlū al-Albāb*.

Seest thou not that Allah sends down rain from the sky, and leads it through springs in the earth? Then He causes to grow, therewith, produce of various colours: then it withers; thou wilt see it grow yellow; then He makes it dry up and crumble away. Truly, in this, is a Message of remembrance to men of understanding (Q. *al-Zumar*; 39:21).

### **An *Ūlū Al-Albāb* Framework for Integrating the Qur'anic Worldview and the Natural Sciences for Islamic Secondary Schools**

With a three-step methodology of (i) identification, (ii) purification, and (iii) beautification and enrichment, this framework comprises a three-dimensional construction:

- I. *Al-Taṣawwur al-Qur'ānī* [the Worldview of the Qur'an],
- II. *Al-Turāth al-'Ilm fī al-Islām* [Islamic Civilisational Legacy and Knowledge Tradition] and
- III. *Al-Mulā'imah* [Relevance].

### *Al-Taṣawwur al-Qur'anī* [The Worldview of The Qur'an]

The Qur'anic worldview forms the fundamental premise and fashions the underlying spirit, through which the curricula

- i. View Allah's cosmos with the servitude, humility, acknowledgement, appreciation, gratitude, literacy, awareness, responsibility, activism, ethicality, accountability and the *qalb* of Ūlū al-Albāb.
- ii. Endeavour to "read" cosmic phenomena, which are *Āyāt Allāh* in His Open Book of nature, and to engage actively toward a deeper and holistic understanding of the cosmos, guided by the study of *Āyāt Allāh* in the Qur'an.
- iii. Identify, and then weed out or reposition, realign, redefine and correct any concept conventional in Western modern science that is injurious or detrimental to the Qur'anic theology, ontology, cosmology, epistemology, anthropology, axiology and eschatology.
- iv. Focus on the threefold relationship, whilst placing realities in the balance of criterion of the ideals:



Figure 1. A simplified schematic representation of an integrated framework toward the construction of the natural sciences curricula and textbooks for Islamic secondary schools. The model is based on a synthesis of al-Ghazālī's discourse on the *qalb* and the Ūlū al-Albāb notion of the Qur'an.

- a. *Ḥabl min Allāh* [humanity with Allah] comprising *‘ubūdiyyah* [servitude] and *khilāfah* [vicegerency],
  - b. *Ḥabl min al-nās* [humanity with itself ] comprising *muḥāsabah* [self accountability], *tazkiyyah* [purification], *al-amr bi al-ma‘rūf wa al-naḥy ‘an al-munkar* [promotion of virtue and prevention of vice], *ummah wasaṭ* [a global Muslim society that upholds excellence, rightful balance and justice], and
  - c. *Ḥabl min al-kawn* [humanity with the Cosmos] comprising *raḥmatan li al-‘ālamīn* [mercy to all the worlds].
- v. Enrich the subject matter of the natural sciences with relevant Qur’anic verses and concepts that pertain to the above elements of the Qur’anic worldview (as detailed in iii) and supplement them with relevant *aḥādīth*, in line with the above spirit.

### ***Al-Turāth al-‘Ilm fī al-Islām* [The Knowledge Legacy in Islam]**

The curricula serve to revive and resume the civilisational legacy and knowledge tradition in Islam:

- i. The study and pursuit of the natural sciences as a revival and continuation of the Islamic knowledge tradition.
- ii. An obligatory endeavour that helps humanity in becoming closer to Allah and earning His pleasure.
- iii. Identifying errors in historical facts associated with certain scientific theories, laws and notable scientific figures.
- iv. Correcting the above with proven data and relevant Islamic civilizational legacy (*turāth al-ḥaḍārat al-Islāmiyyah*).
- v. Enriching the body of knowledge with contributions and legacies of great Muslim scientists of the past.
- vi. Creating awareness of the place held by the natural sciences in the greater civilizational scheme of things.

### ***Al-Mulā’imah* [Relevance]**

The curricula aim to:

- i. Provide relevance of the natural sciences to students’ daily life as Muslims.
- ii. Spark interest and a better appreciation of the natural sciences, so that students may become self-initiated learners.

- iii. Bring contemporaneous relevance (*mu'āṣarah*) of al-Qur'an to students of science
- iv. Make the verses of al-Qur'an 'come alive' in the hearts of students through constant reflections on the cosmos and remembrance of Allah.
- v. Motivate Muslim students to build an affinity with the natural sciences and to become future scientists to develop the Muslim *ummah*.
- vi. Create awareness for learning science as a personal religious obligation (*farḍ*) and its endeavour in society as a communal religious obligation (*farḍ kifāyah*).
- vii. Facilitate teaching and learning in particular, and education in general towards producing *Tawhīdic* inspired scientists and scientific minds who with reference to the Qur'an, study *Āyāt* of Allah in the open book of Nature (*Āyāt Allāh al-Kawniyyah*).
- viii. To empower Islamic religious schools in producing Muslim students with *Tawhīdic* inspired scientific minds, and Qur'anic attitude and activism.

Figure 1 represents, in a very simplified fashion, the framework described.

### Conclusion

Project *N.S.W.V.Q.* (Natural Science from the Worldview of the Qur'an) has managed to publish its first and most important product, *Natural Science from the Worldview of the Qur'an: An Introduction*. The three-volume work is a reference or a supplementary textbook for biology, chemistry and physics, intended for use in Islamic secondary schools, as well as by science educators and the public. The science subject matter is based on the commonality of Malaysian, Indonesian, Cambridge, Bruneian, Singaporean, Filipino, Canadian and American middle and high-school curricula and syllabi. *N.S.W.V.Q.* is written in a fashion that veers away from the conventional. It presents the subject matter of biology, chemistry and physics in integrated themes. Throughout the three volumes, the subject matters of science are discreetly presented from Qur'anic theology, epistemology, cosmology, ontology, anthropology, axiology and eschatology. This involves holistic repositioning, reinterpreting and reorienting certain conventional aspects of Western modern science, whereby humanity's relationship with God, with itself and with the cosmos form the main constructs. Interwoven into the text are corrections of historical facts on scientific and technological developments, based on verified findings on the legacies of Muslim scholars, thinkers and scientists of the golden Islamic age. There are many instances whereby pressing issues of cosmological, ontological and axiological significances are juxtaposed with the current state of the environment to prompt readers into tracing the sources of the problems and to find sustainable solutions based on Qur'anic premises. Despite the limitations of our study, the model supplementary reference textbook, which is written based on the *Ūlū al-*

*Albāb* three-dimensional integration framework is suitable for Islamic secondary education not only in Malaysia, but also in other countries, as long as English is a medium of instruction.

The *Ūlū al-Albāb* three-dimensional integration framework itself is designed from an *ummatic* and Islamic civilisational stance. As it is based on the knowledge and scientific culture of the Qur'an, the framework is deemed suitable and useful for any Islamic secondary school in the Muslim world, transcending language barriers, provided that the framework is accurately translated into the respective languages. It is our vision and hope that the framework and its Islamically integrated model reference textbook for the natural sciences shall fill the void that is so distinctly felt and witnessed in Islamic secondary education of the countries that we visited. Moreover, they shall be an impetus for further research and works that address the need for real, correct, accurate and substantive integration of the Qur'anic worldview and the natural sciences for use at all education levels throughout the Muslim world. This is a small step toward re-establishing the natural sciences as a field of study that is truly based on the *Tawhīdic* worldview of the Qur'an as was the case during the Golden Age of Islam.

In truth, al-Qur'an prescribes the very scientific attitude and worldview that the world of today needs, in lieu of global humanitarian crises, decaying sustainability of the environment and the collapse of civilisational integrity resulting from fundamental systemic failures of modern and post-modern premises and structures. The *ummah* must move away from her current trajectory of mimicking worldviews alien to the holistic and integrative nature of the Qur'an, of the humankind and of all creations. For it is this trajectory that is tearing the *ummah* apart into shards that cannot even manage to sustain its survival, let alone allow it to stand as *al-ummataṅ wasaṅa* [the most justly balanced] (Q. *al-Baqarah*, 2:143) and as *khaira ummah* [the best community] (Q. *Āl 'Imrān*, 3:110), offering the world solutions that are *rahṅmatan li al-'ālamīn* [a mercy to the Universe] (Q. *al-Anbiyā'*, 21:107). It is indeed a religious obligation and responsibility of Muslims, being those with direct faithful and intimate access to the Qur'anic criterion and guidance, to provide an answer. The *Ūlū al-Albāb* framework toward integrating the Qur'anic worldview and the natural sciences for Islamic secondary school is our humble attempt at addressing the long wait for fully integrated science curricula and literature for use in formal instructions. This is a small step toward the Qur'anic and *Sunnatic* ideals. Our future plans include the production of a *N.S.W.V.Q.* teachers' guide, teachers' training programs, workshops and talks to secondary school students, as well as the production of subject and grade-level specific *N.S.W.V.Q.* textbooks; *in shā' Allāh* [God willing].



## **Acknowledgements**

The above project, entitled “Towards a Malaysian Model of Reformed Islamic Religious Education Based on the Integration of Science and the Worldview of the Qur’an: Production of a Secondary School Textbook on Science from the Worldview of the Qur’an” is chaired by Distinguished Professor Tan Sri Dr. M. Kamal Hassan. It spanned from October 2011 to March 2015, bearing its first fruit, M. Kamal Hassan (Chief. Ed.), *Natural Science from the Worldview of the Qur’an: An Introduction*, volumes 1, 2 and 3, (Kuala Lumpur, ITBM, 2018). The present author is the Project Coordinator, administrator, planner and an active member of the research group, from the project’s initiation to its completion. She is also the General Editor and the Chemistry Author. We thank the Ministry of Higher Education Malaysia for funding the project, from the research phase down to the production of the manuscript. We also thank the Malaysian Institute of Translation and Books for working closely with the *N.S.W.V.Q.* team, particularly with the author of this article, in her capacity as the Project Coordinator and General Editor, from the early phases of the project to late in 2017, and in financing the publication of the three-volume work.

## الملخص الموسع

## النظرة القرآنية العالمية وعلوم الطبيعة: إطار عمل أولو الألباب المتكامل للمدارس الثانوية الإسلامية

Nur Jannah Hassan

### الملخص

تضع هذه المقالة مفاهيم أولي الألباب ونقاء القلب معاً في إطار واحد لدمج مع علوم الطبيعة من النظرة القرآنية العالمية. وهذا الإطار يطبق طريقة من ثلاث خطوات وهي (أ) التعرف (ب) التنقيح (ج) التجميل والإثراء. تتكون هذه الطريقة من بناء ثلاثي الأبعاد يشمل: (١) التصور القرآني الذي يشكل المبدأ الشامل، (٢) إحياء التراث العلمي في الإسلام، (٣) تحقيق الملائمة لتطبيق القرآن في دراسة علوم الطبيعة والعكس صحيح. كما يركز هذا الإطار كذلك على علاقات إنسانية ثلاثية الجوانب وهي: العلاقة مع الله والعلاقة مع الناس والعلاقة مع الكون. وهذا الدمج سيكون قادراً على معالجة الصراعات والخلافات واستعادة التوازن على المدى الطويل، ليس في داخل الشخص المسلم والأمة المسلمة فقط ولكنه سيُجلب كذلك الخير الدائم للإنسانية بشكل عام والمناطق التي يعيشون فيها. لقد انتهت المقالة بذكر مشروع علوم الطبيعة من النظرة القرآنية العالمية والذي نشر ثلاثة أعداد بنصوص مرجعية في علم الأحياء والكيمياء والفيزياء للمدارس الإسلامية الثانوية ألا وهي: محمد كمال حسن (مدير التحرير)، علوم الطبيعة من النظرة القرآنية العالمية: مقدمة، (كوالامبور: المعهد العالي للترجمة والكتب بماليزيا، ٢٠١٠) لتقديم كتابات كاملة عن الموضوعات المذكورة.

### الكلمات المفتاحية

التوحيد • النظرة القرآنية العالمية • الدمج، العلم الغربي الحديث • أولو الألباب

إن مشكلة الاندماج في تعليم المسلمين كان أحد المشاكل الكبيرة منذ فترة ما بعد الاستعمار مما ترك الأمة الإسلامية تعاني من إرث من التعليم الضعيف. لقد أدى الضعف الداخلي والاستعمار والحدثة وما بعدها إلى إحداث عدم انسجام في الذات وفي الأسرة والمجتمع والبيئة. لقد فتحت التوجهات العصرية بعد فترة الحدثة الفرصة لظهور بدائل غير مألوفة كخيارات. إن مكانة العلم والتكنولوجيا في بناء الأمة هو أمر لا جدال فيه على الإطلاق. ولكن بدون ثقافة علمية سليمة وفهم ونشر وإحداث تطورات أصلية وتنافسية في التكنولوجيا فإن الدولة ستظل دولة مستهلكة وستكون عرضة لتلاعب القوي الأخرى الموجودة في العالم. وعلى نطاق أوسع فإن الثقافة العلمية السليمة يجب أن تكون هي روح وجود أمة إسلامية واعية وفعالة. وهذه الثقافة هي الثقافة التي يتحلى بها من وصفهم القرآن بأنهم أولو الألباب (وهم من يتحلون بفكر وعقل راقٍ). ويقف التاريخ شاهداً على التأثيرات التي يحدثها العلم والتكنولوجيا وخاصة طبيعة الأسس الفلسفية التي أحدثتها على الإنسانية. إن تربية هذا الشباب المسلم وتطوير وعيهم وعقولهم العلمية القوية على النظرة العالمية للقرآن يعتبر أمراً بالغ الأهمية لأن مستقبل الأمة الإسلامية سيقع على عاتق هؤلاء الشباب.

وعلى الرغم من كثرة المؤلفات التي تؤكد الحاجة إلى توفير تعليم أكثر تكاملاً وبالنسبة للعلوم الإسلامية فقد اكتشفنا من خلال مراجعتنا المستفيضة للمؤلفات المتاحة عدم وجود دراسات كبيرة في مجال دمج عناصر النظرة العالمية القرآنية في مناهج تدريس علوم الطبيعة للمدارس الثانوية. وفي خلال الفترة من عام ٢٠١٢ وحتى عام ٢٠١٢ فقد قمنا بزيارة اثني عشر مدرسة ثانوية إسلامية في ماليزيا واثني عشر مدرسة في إندونيسيا وخمسة مدارس في جنوب تايلاند ومدرسة واحدة على الأقل في كل من بروني وسنغافورة ومينداناو وأونتاريو في كندا. وقد وجدنا من خلال ملاحظتنا ومقابلتنا مع المعلمين وأعضاء مجلس الإدارة والطلاب والآباء في المدارس التي قمنا بزيارتها وكذلك من خلال تحليلاتنا لعدد كبير من المناهج والمقررات والمراجع (باللغة الماليزية والإندونيسية والتايلاندية والإنجليزية والمنشورة في البلدان التي ذكرناها وفي المملكة المتحدة في الفترة من ٢٠٠٢ وحتى ٢٠١٢) والتي قمنا بجمعها من المدارس التي زرناها فقد أظهر كل ذلك نسبة ضئيلة جداً من دمج المفهوم العالمي القرآني في عملية تعليم وتدريب علوم الطبيعة أو في المناهج والمقررات والمراجع الخاصة بتعليم علوم الطبيعة إن مقررات المدارس الثانوية لتعليم علوم الطبيعة ومراجعتها كذلك تعتمد على النموذج الغربي العصري المعتاد من المذهب الطبيعي والفلسفي والميكانيكي الذي يستبعد الإله - عز وجل - من دراسة الطبيعة والإنسان والكون.

تقدم هذه المقالة باختصار أربعة أسس رئيسية لأهمية دمج النظرة العالمية القرآنية في علوم الطبيعة وهي: (أ) التعاليم الموجودة في القرآن، (ب) تجاهل الكثير من الأسس المخالفة في العلم الحديث، (ج) النظرة الطبيعية والفلسفية والميكانيكية للعلم الحديث والانتقادات الغربية عليها، (د) الوضع المعاصر للإنسانية والبيئة التي نتجت بطريقة مباشرة أو غير مباشرة من مثل هذه العلوم. توضح هذه المقالة العناصر الأساسية للنظرة العالمية القرآنية فيما يتعلق بدراسات الطبيعة وعلى وجه التحديد مفهوم قراءة آيات الله في كل من القرآن وفي هذا الكون المفتوح وتناقش المقالة دور قدرات الحواس والعقل في فهم هذه الآيات. فعلى الرغم من ذلك فقد تمت الإشارة في المناقشات إلى كل من - ليس على سبيل التحديد - علم ما وراء الطبيعة القرآني وعلوم الإلهيات والكون والإنسان ونظرية المعرفة والغائية وعلم القيم وعلم الأخرويات. وهذه هي مفاهيم العبودية والخلافة الإنسانية وتدبير الله وتقديره وتسخيرها للكون.

وقد أكد عدد من العلماء والشخصيات العامة المعاصرة من المسلمين وغير المسلمين على الحاجة إلى إيجاد حل إيماني توحيدي. ومن بين هؤلاء مقال هانس كونج الذي أكد أن هذا الأمر هو مهمة المسلمين والمسيحيين. وفي اللاحقة حول العلم الغربي المعاصر فقد ناقشت المقالة باختصار العديد من المشكلات التي تحتاج إلى تصحيح وإعادة تفسير أو إعادة توجيه. والشئ الأكثر أهمية هو انفصال العلوم العصرية عن الإله وابتعادها أكثر عن مفهوم توحيد الإله وهو ما يعتبر سبب جميع المشكلات المترتبة على ذلك مثل أفكار الطبيعة غير مخلوقة وغير القابلة للتلف المادي والطاقة وطبيعة الخلق والطبيعة الإنسانية. ومن بين الأمور التي تم مناقشتها هي الأمور ذات الأهمية.

تقدم هذه المقالة نموذجًا قرائنيًا لتدريس وتعليم علوم الطبيعة بناءً على مفهوم «أولو الألباب» المذكور في القرآن وذلك لاستخدام هذا النموذج في مدارس التعليم الثانوي والذي تخضع فيه جوانب معينة من علوم الطبيعة لإعادة تصحيح وتفسير وتوجيه حكيم وشامل في بنودها والتي تتوافق بشكل طبيعي مع النظرة القرآنية العالمية. وعلى الرغم من أن القيود المادية التي واجهت هذه المقالة والتي تحول دون تقديم تغطية شاملة عن الجوانب السابقة إلا أننا قد ناقشنا عددًا منها باختصار. تشير المقالة إلى أن هذه الطريقة ليست طريقة جديدة بالكامل. حيث تعتبر إعادة التصحيح والتفسير والتوجيه مثالًا معاصرًا لما قام به المسلمون الأوائل عندما قاموا بدراسة المؤلفات القديمة بناءً على الخصائص القرآنية وقد طوروا بنجاح ثقافة قرآنية عظيمة من العلوم التي أصبحت أحد أبرز علامات الحضارة الإسلامية. تحذر المقالة من الطرق الجزئية الشائعة في محاولة دمج هذا النموذج والتي تعتبر طرقًا خاطئة. وقد استخدمنا في بناء هذا النموذج طريقة الإمام الغزالي وحديثه عن القلب. حيث ذكر أن القلب هو شيء روحي، عبارة عن تناغم عضوي بين الروح والنفس والعقل والقلب نفسه. لقد اعتبر الغزالي حالة القلب كمرکز لاكتساب المعرفة وكشف الحقيقة وتحديد قيمة ومسار العمل. وبالتالي فإن القلب يحتاج إلى تصفية.

### Kayankça/References/المراجع

- ‘Alī, ‘A. Y. (1992). *The Holy Qur’an: Translation and commentary*. Brentwood, MD: Amana Corp.
- “Mechanism”. (n.d.). Retrieved October 8, 2014 from [http://www.newworldencyclopedia.org/entry/Mechanism\\_\(philosophy\)](http://www.newworldencyclopedia.org/entry/Mechanism_(philosophy))
- “Naturalism”. (2014, December). In *New World Encyclopedia*. Retrieved April 1, 2016 from <http://www.newworldencyclopedia.org/entry/Naturalism>
- “Naturalism”. (2014, December). Retrieved April 1, 2016 from [http://www.newworldencyclopedia.org/entry/Naturalism\\_\(Philosophy\)#Methodological\\_Naturalism\\_and\\_Science](http://www.newworldencyclopedia.org/entry/Naturalism_(Philosophy)#Methodological_Naturalism_and_Science)
- “Ocean Trash Plaguering Our Sea”. (2015, May 31). In *Ocean Portal*. Smithsonian National Museum of Natural History. Retrieved March 8, 2015 from <http://ocean.si.edu/ocean-news/ocean-trash-plaguering-our-sea>
- “Positivism”. (n.d.). Retrieved October 8, 2010 from <http://www.britannica.com/EBchecked/topic/471865/positivism>
- Akdoğan, C. (2008). *Science in Islam and the West*. Kuala Lumpur: ISTAC, IIUM.
- Al Fārūqī, I. R. (1982). *Al Tawhīd: Its implications for thought and life*. Herndon, VA: IIIT.
- Al Fārūqī, I. R., & Al Fārūqī, L. L. (1986). *The cultural atlas of Islam*. New York & London: Macmillan.
- Alexander, R., & Numbers, R. L. (2010). *Biology and ideology from Descartes to Dawkins*. Chicago & London: University of Chicago Press.
- Al-Ghazali. (2000). *The incoherence of the philosophers* (M. E. Marmura, Trans.). Utah: Brigham Young University Press.
- Al-Ghazali. (2007/2013). *Wonders of the heart* (W. J. Skellie, Trans.). Petaling Jaya: Islamic Book Trust.
- Al-Ghazali. (2009). *The book of knowledge*. (N. A. Faris, Trans.). Petaling Jaya: Islamic Book Trust.
- Al-Nawawi. (1976). *An-Nawawi’s forty hadith* (E. Ibrahim & D. Johnson-Davies, Trans.). Damascus: The Koran Publishing House.
- Ansari, M. F. R. (2001). *The Qur’anic foundations and structure of Muslim society* (Vol 1). Kuala Lumpur: Islamic Book Trust.

- Ashraf, S. A., & Hussain, S. S. (1979). *Crisis in Muslim education*. Jeddah: Hodder & Stoughton, King Abdulaziz University.
- Atiyeh, G. N. (1966). *Rasā'il al-Kindī al-Falsafiyah*. Rawalpindi: Islamic Research Institute.
- Azra, A. (2011, April). *Reforms in Islamic education: A global perspective seen from the Indonesian Case*. Paper presented at the International Conference on Reforms in Islamic Education, UK: University of Cambridge. Retrieved April 7, 2012 from [www.cis.cam.ac.uk](http://www.cis.cam.ac.uk)
- Bacon, F. (2000). *Cambridge text in the history of philosophy: The new Organon* (L. Jardine & M. Silverthorne, Ed.). Cambridge: Cambridge University Press.
- Bakar. (2008). *Tawhid and science: Islamic perspectives on religion and science*. Shah Alam: Arah Publications.
- Bennabi, M. (2003). *Abderrahman Benamara*. Colonisabilité. Alger: Dar el-Hadhara.
- Collins, F. S. (2006). *The language of God: A scientist presents evidence for belief*. New York: Free Press.
- Cooke, S. (n.d.). Why UN climate agreements fail. *Global Research: Centre for Research on Globalisation*. Retrieved December 3, 2012 from <http://www.globalresearch.ca/why-un-climate-agreements-fail/5313881>
- Dewitt, R. (2004). *Worldviews: An introduction to the history and philosophy of science*. London: Blackwell Publishing.
- Freely, J. (2011). *Light from the East: How the science of Medieval Islam helped to shape the Western world*. New York: I.B. Tauris & Co. Ltd.
- Golshani, M. (1989). *Philosophy of science from the Qur'anic perspective*. In *Toward Islamization of Disciplines* (pp. 73–92). Herndon, Virginia: IIIT.
- Golshani, M. (1997). *The Holy Quran and the sciences of nature*. Bringhamton University: Global Publications.
- Grant, R. (2009, April 24). *Drowning in plastic: The great pacific garbage patch is twice the size of France*. The Telegraph. Retrieved March 8, 2016 from <http://www.telegraph.co.uk/news/earth/environment/5208645/Drowning-in-plastic-The-Great-Pacific-Garbage-Patch-is-twice-the-size-of-France.html>
- Hassan, M. K. (1980). *Integration of Islamic values in science and technology education in the context of national development: A challenge to Muslim decision-makers and educators in Malaysia*. Paper presented at the International Conference on The Role of Universities in Developing Nations.
- Hassan, M. K. (1981). *The implications of science and technology education and development on Islamic values*. Environmental Education and Research in Indonesian Universities, Maruzen Asia.
- Hassan, M. K. (Ed.). (2018). *Natural science from the worldview of the Qur'an: An introduction*. Kuala Lumpur: ITBM.
- Hawkings, S., & Mlodinow, L. (2010). *The grand design: New answers to the ultimate questions of life*. London: Bantam Press.
- Kaplan, S. (2016, January 20). *By 2050, there will be more plastic than fish in the world's oceans, study says*. The Washington Post. Retrieved March 9, 2016 from <https://www.washingtonpost.com/news/morning-mix/wp/2016/01/20/by-2050-there-will-be-more-plastic-than-fish-in-the-worlds-oceans-study-says/>
- Kartanegara, M. (2008). Secularization of science and its Islamic answer. In A. Baharudin (Ed.), *Islamic science and the contemporary world: Islamic science in contemporary education*. Kuala Lumpur: ISTAC.

- Kuhn, T. S. (1996). *The structure of scientific revolutions* (3rd ed.). Chicago and London: The University of Chicago Press.
- Küng, H. (2007). *Islam: Past, present and future*. Oxford: Oneworld.
- Leveillee, N. P. (2011). *Copernicus, Galileo, and the Church: Science in a religious world*. Student Pulse, 3(05). Retrieved October 2, 2015 from <http://www.studentpulse.com/a?id=533>
- Motley, B. (n.d.). *The Master's College, U.S.A. "Western Concepts of God."* In *Internet encyclopedia of philosophy: A peer-reviewed academic resource*. Retrieved January 9, 2016 from <http://www.iep.utm.edu/god-west/#SH2a>
- Nofäl, N. (1993). *Al-Ghazali*. In *Thinkers on Education*. In *Prospects: The Quarterly Review of Comparative Education* (Vol. 23, No. ¾, pp. 222–236). Paris: UNESCO, International Bureau of Education.
- Popper, K. R. (1996). *The myth of the framework: In defence of science and rationality*. New York & London: Routledge.
- Qutb, S. (1995). *Muqawwimāt al-taṣawwur al-Islāmī*. Cairo: Dār al-Shurūq.
- Rollin, B. E. (2006). *Science and ethics*. Cambridge: Cambridge University Press.
- Sheldrake, R. (2012). *The science delusion*. London: Hodder & Stoughten Ltd.
- Tarnas, R. (1991). *The passion of the Western mind: Understanding the ideas that have shaped our worldview*. New York: Harmony Books.
- World Centre for Islamic Education. (1983). *Recommendations of the four world conferences on Islamic Education*. Makkah al-Mukarramah: World Centre for Islamic Education.