Integrating And Infusing Of Islamic Values In The Existing Engineering Course Subject: A Case Study

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ABSTRACT

This paper presents the approach by the authors in implementation of Islamisation of human knowledge through integrating the Islamic values with engineering subjects. The theoretical concepts of Islamisation of human knowledge in engineering education have been presented and published in so many conferences and articles, however some are found too philosophical in nature that made ordinary technologist and/or engineering educators have difficulties to understand and implement. Questions that always arise; what are the problems that militate against execution of the Islamization programme in engineering education? And, what roles can Islamic educators (murrabbies) play in order to ensure the accomplishment of the Islamization of engineering knowledge? The case study reported in this paper is an example of author’s trial in integrating the Islamic values into the existing engineering subject with the aim to develop students upon graduation will have the ‘ilm, iman, amal and akhlaq; and at the same time indirectly answering the two above-mentioned questions.

Key words: Islamisation; humanknowledge; engineeringeducation

Introduction

Islam as a religion and a complete way of life (Ad-Deen) enjoins all Muslims not only to seek for knowledge but also to utilize and impart it in accordance with its tenets. At the early stage of Islamic world, educational objective was not only at the spiritual development of an individual but also his intellectual, emotional, social, economic and physical well being. Consequently, the early scholars of Islam were intellectually sound in all aspects of human life.

With the passage of time, however, the urge for Muslims to seek for knowledge declined. This was further compounded by colonialism as a result of which Muslim traditional Islamic institutions were dominated by secularism. The impact of modern thinking stream also has slowly brought Muslims far from Islamic values. This phenomenon has made those who were attracted with this kind of thinking stream felt strange with the original/true Islam and as a consequence they were kept on being isolated from the original/true Islam. Islam then was no longer seen as the best guide for a perfect life. As a fact, there are so many Muslims who are being far from the religion nowadays. They are looking at their life only through materialistic vision (madiyyah) as casted by western/secular educational system. The surge for Islamization of human knowledge emerged having realized the gross inadequacies of the western/secular educational system, which aimed only at outward development of individuals

In authors’ opinion, the corrective measure should inculcate the concept of ikhsan, which is one of the three main divisions that form our religion (Ad-deen) besides Islam and iman.

The knowledge (i’lm) for islam is called syaria’i, the i’lm for iman is called tawhid and the i’lm for ikhsan is called Tasawwuf. Allah creates us with purpose, and the purpose is as Allah says in Surah Az-Zariyyat, sentence 56; “...al-jin and al-insan are created solely for worshipping and performing ibadah to Me”. Types of ibadah to perform are explained in detail by the learning of i’lm of syariat, and how do we suppose to perform the ibadah, is what has been defined by Rasulullah (SAW) of ikhsan i.e., “Worship Allah as we could see Him, and if we
Couldn’t, bear in mind that Allah always observe us”. To understand the definition, no matter what, we need to learn the i’lm of ikhsan which is Tasawwuf.

What are being elaborated in the below topics are all about a famous statement; Islam is Ad-deen. Ad-deen is defined by our scholars as ‘the way of life’. By learning Tasawwuf, it could make us always think of Allah for anything we do in our life.

As elaborated by some scholars (Kasule, 2003 and Al-Faruqi, 1983), all knowledge whatever its kind and source are Islamic. Islamic knowledge has no time and space constraint because Islam is universal being suitable for every place and time.

This paper is not a complete and not an overall view of Islamization process of engineering subject. This is only highlighting authors’ experience in implementing the Islamisation of the engineering knowledge to the perspective and to the level of ordinary engineering students in Kulliyyah of Engineering, International Islamic University Malaysia (IIUM).

The Existing System of Engineering Curriculum:

The existing engineering subjects are found if not all, mostly adopted from the western/secular syllabus which is over emphasizes the role of materialism, empiricism, reason, relativism and host of other modern isms. A close examination of those syllabuses shows that they are based on the following principles;
1. The sovereignty of man, as though he is supreme.
2. Factual Knowledge is acquired only through human reasoning and experience (empirical).
3. Unrestricted freedom of thought and expression.
4. Unwillingness to accept metaphysical truths.
5. Individualism, relativism and materialism.

The existing curriculum is seem to be very unbalanced and there are need for the Islamisation of engineering education and it has long been discussed, yet not implemented.

The Need for Islamisation Process:

The quality of an individual is related to his/her education; the quality and the quantity of his/her education, the direction of his/her education and the relevancy of his/her education. That is why the context, manner of teaching and the contextualizing the subject in Islamic framework are found essential.

The need for Islamisation of engineering subject can be generalized as below;
1. To enrich the subject with an Islamic perspective (by accurately reflects the contribution of Islam and Muslims scholars to civilization).
2. To unify the subject matter (by integrating the sacred and secular aspect of the subject).
3. To ensure that all students gain knowledge and understanding of the Islamic legacy, its spirit and history and be proud of Muslim scholars.
4. To be able to distinguish themselves from non-Muslims and feel proud of this distinction and anxious to preserve. Thus becoming self-conscious of their true identity.
5. A true vision of Islam will stop Muslims being influenced by Godless ideologies.
6. To emphasize that Islam is a comprehensive religion and its teachings are relevant to every aspect of life and every subject of the curriculum.

The intention of the above needs could possibly develop a balanced personality, pleasing to God and to fellow humans, who promote and encourage ma’ruf (good) and fight munkar (evil)’. On the other hand the intention of the above needs requires the engineering educators to also acquire knowledge in Islamic civilization as well as basic Tassawf.

The Framework for Islamisation of Engineering Subjects:

The author is using the framework of Islamisation of education which is set by scholars in this area namely Al-Faruqi (1983) and Kasule (2005, 2007) as a guideline for integrating the subject and Islamic values. In the framework there are three elements of Islamisation that had been underlaid;

Belief in oneness of God: Tawhid:

This is beautifully and succinctly summarized in Surah Ikhlás:
“Say He is one God: God the eternal, the uncaused cause of all that exists. He begot none neither is He begotten; and there is nothing that could be compared with Him.” Surah 112:

The word ‘as samad’ alludes the eternal and independent nature of God and that all others are dependent on Him. The belief in Tawhid is adequately summarized by Imam Nasafi (d.537 AH) as follows:

i. The Creator of the universe is Allah, the One, Eternal, All-Powerful, All Living, Omniscient, All-Seeing, All-Hearing, The All-Willing and Desirous.

ii. Allah is neither an element nor a property, nor does He have a form or a body.

iii. He is neither limited, nor numbered. He neither consists of parts, nor is He an organism and He is not a finite being.

iv. He cannot be ascribed a nature, nor a state, nor a place, nor a time.

(Aqaid An-Nasafi)

The belief in Allah as our creator, sustainer and guardian leads to the idea of us being indebted to him. The whole purpose of life then becomes an attempt by man to repay that debt through devotion and service. Man lives to seek Divine pleasure and fulfill Divine purpose.

**Man is Khalifatullah: Vicegerent:**

Man is crown of Allah’s creation and has been vested with the epithet of Khalifah: the deputy, the vicegerent, pointing to man’s supremacy on earth, since Allah had made him everything subservient to him. In other words he is capable of enjoying these worldly gifts, and being responsible for them.

As a vicegerent man is expected to willingly to submit to Divine commands, religious laws and moral virtues. This role of man leads to a holistic approach to life as a unity and not to treat it as a duo of sacred and secular. The best exemplary Khalifah ever created by Allah is Prophet Muhammad (SAW) whose every conduct is known as Sunnah that would be beneficial if strictly followed.

**The complimentary nature of revelation and reason:**

The two sources of knowledge are the revelation and reason. The revelation provides knowledge and understanding of the unseen world, that which is beyond human perception and imagination; heaven and hell, day of judgment, the life in the grave, angels etc. as well as guidelines for living a successful life. The revelation underpins the norms of intellectual behaviour, social relations and personal development.

Human reason is one of the greatest Divine gifts to mankind through which he can establish the truth. Discern right and wrong, be just and kind. In Islam therefore there is no contradiction between revelation and reason both complement one another.

However despite the enormous potential of human reason it needs divine revelation. Why? “Through chosen messengers Divine revelation endows reason with concepts of governing his social relationships that are essential to guide his conduct so that he may realise his aims in life.

**Case Study: The Approaches:**

As a consequence from the principles of Islamic Engineering Education, effective teaching and learning must then be meaningful. Students should feel that the curriculum is worth learning, because of its meaningful and relevant, students are motivated to learn. Furthermore, students should be led to discover the larger connections between the knowledge and skills they are learning – rather than memorizing isolated bits of information. The students must be trained to always keep their eye on the whole picture, or macro-view, whenever studying. This, partially is the meaning of Tawhid.

Until this paper is reported, the author has divided the approach that has been implemented in two approaches:

i. Superficial approach

ii. Inculcating Islamic teaching in course

**Jump start with superficial approaches:**

The author believed that for the effectiveness of Islamisation process, Islamic teaching and learning must be value based. By focusing on values and considering the ethical dimensions of topics, Islamic education will becomes a powerful vehicle for character and moral development, hence achieving its real purpose. In executing this is Islamisation process, the author realize that every aspect of the teaching –learning experience conveys value to students and provides opportunities for them to learn about values. From the selection of
content, materials and activities, up to the arrangement of the class room, class rules and management styles, students are exposed to and learn values. Therefore, the author has made a conclusion that the educator should develop a better awareness of their own values and those values definitely influence their behavior as role models and the students in the end, will learn from these experiences about themselves, others and Islam.

Considering the above statement, the authors felt it is necessary to start the Islamisation process with which is said to be superficial to certain educationist and philosopher (Husain, 1979, Kafal-Ghazal, 2007) in this area. Among the activities implemented:

- **Practicing of giving salam**

  This activity is to inculcate the culture of giving *dua’* to their brother and sister in Islam to show that they care each other, by following the *hadith* of

  “Those who not love, will not be loved”:
  Abu Daud and Tirmidhi:

- **Recitation of the ummul kitab before starting the class**

  This is practiced, in order to aware the students that Muslims have been commanded by Allah to recite the *ummul kitab* (*Surah Al-Fatihah*) and to alert them to the extreme importance of this concise but deep *Surah*. Its teachings aptly touch upon and summarize the entire spectrum of Islamic teachings. It is also teaching about *Tawhid*.

- **Awareness on the purity intention of seeking knowledge**

  The students are reminded in each class on their intention of seeking knowledge is part of ‘*ibadah* not just chasing for the academic performance. The students are also be reminded that the religion of Islam has encouraged and sometimes even placed the obligation upon humans of specific manners and mores in regards to life outside worship. It has legislated various methods in performing every day activities, from sleeping to eating and moreover in studying. If a person performs the various activities in conformity to its legislation, they will be rewarded for it.

  In order to support the above mentioned lesson the students are reminded to memorize and understand a *hadith* of:

  From 'Umar ibn al-Khattaab (radiyallaahu 'anhu) who said that Allah's Messenger) said:

  Actions are but by intentions and there is for every person only that which he intended. So he whose migration was for Allah and His Messenger, then his migration was for Allah and His Messenger, and he whose migration was to attain some worldly goal or to take a woman in marriage, then his migration was for that which he migrated:

  *Riyad-As-Salihin*, Volume 1, Chapter1:

  *Hadith No. 1:*

- **Insertion of Quranic verses and hadiths in the course**

  This is to remind the students that Muslims hold that Islam is derived from two sources: one being infallible and containing compressed information; the Qur'an - and another being a detailed explanation of the everyday application of the principles established in the Qur'an: the *Sunnah*, or the living example of the Islamic prophet Muhammad.

  For the validation of the information students are given with another *hadith* that advised to be memorized and understood:

  *I have left among you two matters by holding fast to which, you shall never be misguided: the Book of Allah and the Sunna of His Prophet.*:

  *Sunan Thirmidi*, Volume 6, Chapter 31, Hadith No. 3788:

- **Searching for ‘scientific’ facts in the Qur’an while teaching the course.**
The students need to be made aware that, from an Islamic standpoint, science and engineering; the study of nature, is considered to be linked to the concept of Tawhid (the Oneness of God), as are all other branches of knowledge. In Islam, nature is not seen as a separate entity, but rather as an integral part of Islam’s holistic outlook on God, humanity, and the world. This link implies a sacred aspect to the pursuit of scientific knowledge by Muslims, as nature itself is viewed in the Qur’an as a compilation of signs pointing to the Divine.

B. Inculcating Islamic teaching in course:

- Giving an Islamic context and an Islamic perspective to the existing course

It is in the humble thought of the author that to assure the successful process of Islamisation, the effective teaching and learning ought to be active. The educators must be actively engaged in the teaching process; making lesson plans, choices and course adjustment as needed and required. An effective engineering educator also must be prepared to continuously update his or her knowledge base, adjust goals and content of the course outlines to meet the student needs, taking advantage on unfolding events and teachable moments (Wan Daud, 1998 and Mudawi, 1989).

For this purpose, the author has made a trial in revising the courses outlines so that it will be in context of the four Quranic phenomena that is proposed by Omar Kasule are used, which comprises of:

- Taskhiir- placing the universe at the service of humans
- Isti’ imaar-building civilisation
- Khilafat- establishes the authority of Allah on earth, and the Khilafat strives to uphold that authority within the community of followers.
- Ilm’ nafi’e

For the purpose of reporting in this paper, one example is taken from the course with course code of “MME 3210” where the outline of one of the subject was change informally from:

“This course will educate in the use of complementary materials characterization techniques through understanding the advantages and limitations of commonly used analytically different X-ray and electron microscopy characterization tools. Students will be acquainted with the principles, instrumentation and operation of X-ray diffraction (XRD), scanning/transmission electron microscopy (SEM/TEM), energy dispersive spectroscopy (EDS), Thermal Characterization Techniques (TGA/DSC) and optical microscopy, for characterization of materials. Practical methods of designing experiments, sample preparation, data collection/interpretation will be highlighted. The student should gain an understanding of the importance of these tools individually and complementary to each other in designing and solving materials-related problems.”

To a new course synopsis of:

“This course will educate the students within the context of 4 Qur’anic phenomena: taskhiir, isti’ imaar, khilafat, and ‘ilm nafi’e in the use of complementary materials characterization techniques through understanding the advantages and limitations of commonly used analytically different X-ray and electron microscopy characterization tools. Students will be acquainted with the concept of diffraction in the al-Quran and integrated it with the principles, instrumentation and operation of X-ray diffraction (XRD) and optical microscopy as well as scanning/ transmission electron microscopy (SEM/TEM). The study of thermal characterization technique (TGA/DSC) will be based on the concept of thermal in Al-Quran and in the contextual of ilm’ nafi’e. Context of khilafah is used in practical methods of designing experiments, sample preparation, data collection and interpretation. At the end of the course, the student should realized that among the great blessings that Allah gave humans was to make all other creations subservient to them so that they may use them for their benefit, taskhiir al kaainaat an gain an understanding of the importance of these tools individually and complementary to each other in designing and solving materials-related problems.”

- Mentioning relevant attribute of Allah at every opportunity.

Since the subject is dealing with the theory of diffraction, optics and thermal analyzing of materials. The students are advised to find the concepts of diffraction in al-Quran. Theory of diffraction are mentioned in the Al-Quran, in Surah Al-Baqarah (2) ayah 57:

And we shaded you with clouds and sent down on you Al-Manna and the quails, (saying): “Eat of the good lawful things we have provided for you,” (but they rebelled). And they did not wrong us but they wronged themselves:

In An-Nisaq (4) ayah 57;
But those who believe (in the Oneness of Allah) and do deeds of righteousness, We shall admit them to Garden under which rivers flows (Paradise), abiding therein forever. Therein they shall ‘Azwajun Mutahhratun’ and We shall admit them to shades wide and ever deepening (Paradise):

At the end of the class-session, the students will be reminded on one element of Islamisation that had been mentioned before, that is element of Tawhid. It shows to them that Allah Almighty is the creator having limitless of knowledge and He the all knower.

- Relating all aspects of the teaching and learning to the example of the Prophet Muhammad (SAW):

  The ‘adab as a student that has been taught by our Prophet Muhammad (SWA) is made aware to the students during the class session and it is continuously be reminded.

- Reflecting the contribution of Islam and Muslims scholars to the course taught:

  The students were taught on the contribution of Muslim scholars, namely Ibn Hythm and Al-Kindi in the theory of diffraction and optics which a major bulk from the course contents, and how their contribution had led to the finding of new theory and invention as Bragg’s Law and Rothernberg design of X-Ray diffractometer.

Other approaches:

- There are some other approach that had been planned but not yet implemented and will be implemented, once the author had enough information and proper strategy to implemented them. The planned approaches are:
  - Comparing or contrasting with moral and spiritual values.
  - Carefully assessing the validity of reason and rational arguments and empirical data.
  - Clarifying and collaborating scientific facts with Quranic verses and Ahadith.
  - Stressing the sacred nature of all knowledge.
  - Reading Qur’an and Sunnah with understanding of the changing time-space dimensions, while at the same time knowing limitations of literal reading and interpretations.

Outcome from the Islamisation Process:

It is found out that the students are responding to the process of Islamisation of engineering courses. The outcomes of this process however are too subjective and very difficult to be measured. The author is not sure on how much that the students have internalized this Islamic value. So far there are no proper tools that can measure the internalization of the Islamic value. At the end of the semester however, the author has found out that the students were able to:

  i. Memorised 3-6 hadith which related to Man as khalifah, the purity of intention, and the need for ‘mahabbah’ among Muslim brothers and sisters, and the importance of ‘ilm.
  ii. Know the contribution of the Muslim scholars in the course taken,
  iii. Underline that Islam is a comprehensive religion and its teachings are relevant to every aspect of life and also in the course taught.

Challenges in Islamisation of the Course:

In the process of Islamisation of engineering courses, the author founds out that there are a lot challenges/circumstances faced. Among others are:

A. Effects of colonialism on the Muslims educators and students:

No doubt that, in all colonized Muslim nations the colonialist devised well thought-out and well-planned strategy to ensure that the Euro-Christian legacies were well established thereby consigning the traditional Islamic education to deterioration (Reagen, 2005). This was because it was the colonialists’ plan to keep Islamic education out of touch with reality and modernity. They established the so-called secular schools a view to perpetuating not only secular oriented human resource development but also to fashion the developmental approaches to conform to the secular worldview. Consequently, most of those who attended secular schools were brainwashed and corrupted, as their thoughts, attitudes and visions were modeled to be in line with secular worldviews (Talbani, 1996). Having spent most of their lives in this situation therefore, it is very difficult to redirect the student minds to see vision and accept the mission of Islamization of knowledge programme wholeheartedly.
B. The engineering educators are not Islamically well versed:

Since the author personally trained from the secular institution, more time consumed to understand the ideas on the Islamisation of engineering education. Not just that, to adopt to certain Islamisation or engineering education framework also, certain terminologies which is written in Arabic need to be clearly understood, before implementing it in the class. The authors also, does not have enough time to devote solely to the Islamisation of engineering education programme as a result of other works schedule.

C. Lack of Islamically oriented curriculum:

Since the Islamisation process which takes place is not an Islamisation of the engineering programme/curriculum and it is only Islamisation process of the course the authors found out that, there is very difficult to see the internalizing of the Islamic values in the student as there is no continuation in the process.

Therefore, in the author opinion there is a need for the engineering educators to sit together and put a collective effort and come out with a concrete framework of Islamisation of engineering curriculum.

D. Constraints by Awarding / accreditation agency:

In the process of revising the course outline to integrate with engineering education, the author found out that, the preparation of the course outline must be in accordance to guidelines given by Engineering Accreditation Council (EAC). Therefore, it limited the Islamic education that need to be integrated in the education engineering.

E. Lack of understanding in the concept of Islamisation of knowledge

Difficulties in understanding the concept and direction of Islamisation of engineering education in IIUM itself is another contributor to the challenge of designing of the Islamically oriented course.

Suggestion:

Based on the experiences, the author would like to suggest some actions that need to be taken by educators and managements in other to realize the concept of Islamisation of engineering curriculum in Kulliyyah of Engineering, IIUM. The suggestion would be:

i. Educate the educators with Islamic study as what IIUM has before, that each of newly joint lecturer need to take Diploma in Islamic Study. The educators also are encourage to learn basic ‘Tasawuff’

ii. Educators from Kulliyyah of engineering are encouraged to collaborate with the educators from Kulliyyah of Islamic Reveal Knowledge in preparing the course outline, so that integration of Islamic values into engineering education could be materialized.

iii. IIUM should have a proper unit or center that will monitor the execution of the Islamisation process in each of the Kulliyyah.

Summary:

As a summary, the education of a Muslim engineer should encourage development of a culture involving attitudes and values that can be learned from Islamic methodological of science and technology. Studying the methodological Islamic science and engineering in the contextual of four Quranic phenomena; Taskhiir, khilafat, isti’maar and ilm, nafie will help in moulding and intellectual preparation and balance of the future engineer within in Islamic context. Studying the history and achievements of the early Muslim scholars will be inspiration for the young generation, Insha Allah.

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