

DEVELOPMENT OF INTEGRATED SCIENCE TEXTBOOKS BY APPLYING THE ENRICH TOOL

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ABSTRACT

The Islamization of Human Knowledge (IoHK) focuses primarily on the integration between the curriculum for professional courses and the Islamic perspective, in addition to the training of educators to be *murabbis*, and the infusion of teaching materials with Islamic outlook and Islamic perspectives. The availability of teaching materials which are infused with the Islamic perspective are still lacking, especially for science based subjects. Therefore, a study on the development of an Islamically integrated Physics Text book for the matriculation level was conducted. As a result, this paper is produced to report on the appropriateness of the proposed tool used for this purpose. The *ENRICH* tool is developed with the expectation that it will give an effective guideline in the Islamization process of any sciences textbook. *ENRICH* consists of six main processes namely Eliminate (E), Nourish (N), Readapt (R), Infuse (I), Create (C) and Harmonize (H). In the aforementioned case study, the *ENRICH* tool was applied as a guideline to develop Chapter 3: The Laws of Motion of Physics Textbook, Volume I used at the Centre for Foundation Studies, IIUM as a template. Although there are still plenty of rooms for improvement, it is believed that the Islamized of textbook will aspire students to gain knowledge in Islamic perspective.

Keywords: Islamization, integrated textbook, Physics, science, ENRICH Tool.

Introduction

Ever since the introduction of Islamization of Knowledge (IOK) few decades ago, numerous endeavours have been made to produce and publish textbooks based on the concept of Islamization of Knowledge (IOK) (Hashim & Abdallah, 2013). In the case of the science discipline, despite the marathon efforts to produce Islamic integrated version of textbooks at the tertiary level, the outcome is unfortunately not as expected. For instance, according to Hashim and Abdallah (2013), at the International Islamic University Malaysia (IIUM), which is known as the leading university for IOK, more than 90 percent of the curriculum is primarily based on the Western, i.e. non-Islamic perspective, particularly theories and books which originate from America. Ahmad et al. (2011) supported the argument by exposing that at the Kulliyah of Engineering (KOE), the prominent science based faculty at IIUM, there is a severe lack of Islamic inputs in the modules, text books as well as teaching materials at all levels of studies. The insufficient production of Islamized textbooks and teaching materials were contributed by the lack of competent educators in providing the Islamic perspectives in their disciplines (Hashim & Abdallah, 2013), less priority given by

the top management (Ragab, 1993, 1997 and 1999) as well as ineffective strategy and technique in the implementation (Ahmad et al., 2012; Hashim & Abdallah, 2013).

This finding was not surprising, as al-Faruqi (1988), who was one of the foremost guru of IOK and was instrumental in contributing practical ideas at the very beginning, when the IOK concept was first introduced, asserted that “producing university-level textbooks is among the most difficult to realize because it involves recasting some twenty disciplines in accordance with Islamic visions”. This shortage, on the other hand led to motivate educators to further seek for solutions by creating or developing viable techniques to produce integrated science textbooks effectively and efficiently.

The aim of this study is to introduce the ENRICH tool as an attempt to effectively standardize and accelerate the development of Islamic integrated version of science textbooks. In the first section, literature review is conducted in order to provide a concise background on the previous efforts and techniques to produce Islamized science textbooks. In the Result and Discussion, the ENRICH Tool is introduced and the justification behind each of the processes is elaborated. Subsequently, the application of the ENRICH Tool is elucidated in developing Chapter 3: The Laws of Motion, Physics Volume I as a template of this study is discussed. The overall evaluation of this newly minted method is interpreted in The Way Forward and the Conclusion, taking into account the development of future works.

Approaches And Techniques In Developing Integrated Science Textbooks

Ineffective strategy and technique in writing is one of many factors that prominently contributes to the lack of Islamic version of science textbooks in the tertiary level (Hashim & Abdallah, 2013). This is true, as we can hardly find established, practical and standard methods to Islamize the so-called Western version of existing science textbooks. This is in contrary with the understanding of the simplicity of the process of Islamization of Knowledge as defined by Kasule (2005), where she opposes the idea of “re-inventing of the wheel of knowledge”, but insists that the process should be “enrichment of knowledge with an Islamic perspective through reform, correction, and/or re-orientation”. Due to this deficiency, creating a standard, effective and practical technique that is capable of transforming the existing Western based science textbooks into Islamic integrated version is vital and a priority.

The ultimate purpose of developing a special tool for execution the Islamization of science textbooks is to standardise the technique and process. As a result, the production of Islamic integrated science textbooks should be more effective and efficient as well as expandable to any science textbook at various levels. Moreover, the variation of outcomes due to different background of authors involved in the Islamization activity can be controlled and reduced significantly.

The questions that always arise when educators want to initiate the activity of Islamization of science textbooks are: How to begin the process? What is lacking in the current textbooks from Islamic perspective? Which contents need to be Islamized?

To answer the questions, it is essential to refer back to the fundamental concepts of Islamization of Knowledge as spearheaded by two IOK gurus, Al-Attas and al-Faruqi. Hasyim and Rossidy (2000) have studied and made a comprehensive comparative analysis of the conceptions of IOK from the perspectives of these two great scholars. From their studies, the authors concluded that both philosophers share the same interpretation of IOK. Both agree that the contemporary knowledge needs to be modified “whereby the bad elements and impurities are eliminated, amended, reinterpreted or adapted to be in accordance with the dictate of the Islamic worldview or values (al-Faruqi's terms) or isolated or removed and then infused with Islamic elements and key concepts (al-Attas' terms)”.

In giving definition and setting the process of Islamization of contemporary knowledge, Al-Attas (1991, 1993) clearly insists that in order to produce true knowledge, the existing body of knowledge must be isolated, freed and neutralized from foreign elements and key concepts as the first major step, before the infusion of Islamic inputs can take place as the following step. According to him, this general process is also applied to human sciences where he finds that “alien concepts also penetrate into the natural, physical and applied sciences that are specifically concerned with the interpretation of facts and formulation of theories” (al-Attas, 1993). He opposes the idea to simplify the IOK process by embedding secular knowledge into Islamic sciences because according to him, this approach will lead to constant conflicting results.

Al-Faruqi on the other hand, defines Islamization of modern knowledge with emphasis on integration. According to him, Islamization of modern knowledge is reorganising knowledge into the Islamic way by integrating “the new knowledge into the corpus of the Islamic legacy by eliminating, amending, re-interpreting and adapting its components as the world view of Islam and its values dictate” (al-Faruqi, 1982). He believes that to Islamize knowledge is “to redefine, and reorder the data, to rethink the reasoning and relating of the data, to re-evaluate the conclusions, to re-project the goals and to do so in such a way as to make the disciplines enrich the vision and serve the cause of Islam” (al-Faruqi, 1982). His idea is different from that of al-Attas, where he believe that the eliminating process of the foreign elements can be implemented as a subset of the integration as the dominant approach.

Even though both al-Attas and al-Faruqi hold different approaches in implementing IOK, in principle, however, they agree that there are two major approaches that must be executed, which are elimination and readapting of foreign elements and infusion of Islamic inputs. This approach is in line with the suggestion of a group of educators in a Focus Group Discussion (FGD) held on 18-19 November 2014 at KOE, IIUM. They proposed two significant processes in the IOK, namely ‘omitting’ from the western based curriculum and ‘infusing’ with Islamic inputs (Zain et al., 2016). They elaborated that the omitting step involves process of eliminating the philosophy from non-Islamic values (e.g. Darwinism, nature etc.) as well as destructive knowledge (e.g. the making of nuclear bombs) from the body of the knowledge.

The following steps should answer these questions; What contents to be imbued to replace the eliminated elements? Which Quranic verse and Hadith can be related to the contents? What kind of Islamic elements to be infused into the content? There are many ideas contributed from various scholars and academics in response to the questions.

The most crucial input that should be imbued into the knowledge, according to most scholars, are revelation and Tawhidik. According to al-Attas, the metaphysics of Islam is firmly grounded upon Revelation, affirmed and supported by human intellectual experience and intuitive principles. For that reason, he insists that "knowledge requires continuous direction, supervision and confirmation from the revealed truth" (Hasyim and Rossidy, 2000). Brohi (1993), meanwhile states that process of Islamising standard textbooks indicates modifying the modern knowledge to make them consistent with Quranic principles and concurrently the harmful elements are abolished.

In this regard, it is essential to note that even though the root of science and some scientific facts can be found in the al-Qur'an, however the details are not explained (Najjar, 1988). For the science field alone, there are more than 750 applicable Quranic verses which direct human beings to observe the universe and to think about its amazing structure and phenomena (Najjar, 1988). There are various verses of the Qur'an that mention facts related to science, for instance, Physics (Q24:35); Chemistry (Q57:25), Biology (Q21:30; 6:99; 22:5 etc) and Geology (Q79: 32; 27:61 etc.) to cite but a few (Adebayo, 2015). This kind of scientific verses might lead Bucaille (1993) to conclude that the Quran contains "many observations on natural phenomena and includes explanatory details which are seen to be in total agreement with modern scientific data" (Adebayo, 2015). By observing the laws governing the universe, one can get to know the perfection of the Creator, believe in His Existence, Oneness and as a result, appreciate His gifts by using them for the betterment of life on earth.

Besides al-Qur'an, the al-Hadith also should be taken into account as another major sources of authentic revealed educational knowledge (Sharif, 2007; Talbani, 1996). For example, there is a hadith mentioned by prophet Muhammad SAW 1,400 years back, which gives accurate account of the stages of a foetus in the womb of pregnant women, when the hi-tech medical equipment had not yet been in place. (Adebayo, 2015).

In the same vein, al-Faruqi (1988) proposes that in recasting process of every branch of knowledge, the dichotomy between 'aqli (acquired) and naqli (revealed) sciences must be eliminated to succeed the unity of knowledge. In this regards, he believes that Tawhid acts as the fundamental of the Islamic worldview and is the unifying principle of Islam. Using this basis, he progresses his idea and methodology of Islamization of modern knowledge (al-Faruqi, 1983). Ahmad (1988) supports the conception and asserts that there is no conflict between science and faith in Islam. In a similar vein, Kazi (1988) asserts that the study of science should strengthen the faith of the believer. Zain et al. (2016), meanwhile conclude that learning science and scientific discoveries from the Islamic perspective means studying the signs of the Existence, Greatness and Oneness of Allah SWT.

Besides the incorporation of the tawhidik worldview and Quranic revelations into the body of the knowledge, there are more ingredients that should be incorporated, such as the Islamic worldview, shari'ah, sirah (history) and Sunnah as well as positive elements of tasawwuf, Islamic ethics (akhlaq) and Arabic language (al-Attas, 1993). Among those elements, history is the most highlighted element by many scholars and academics. Ahmad et al. (2012) propose that in order to ensure the students understand the Islamic legacy, as well as its spirit and history, the curriculum must be enriched to accurately reflect the contribution of Islam and Muslims scholars to the knowledge and civilization. The contribution of Muslim scholars who are renowned in all spheres of scientific endeavours such as al-Kindi, al-Khawarizmi, al-Razi, Thabit ibn Qurran, al-Battani, al-Farabi, al-Biruni, Ibn Sina, Ibn al- Haitham should be embedded in the textbooks as well as learning activities.

Another element that is frequently highlighted by most scholars and academics in regards to IOK is Islamic values. Science could not be labelled as being value-free (Adebayo, 2015), in fact all the sciences should remoulded to incorporate value (al-Faruqi, 1982) and to be infused with Islamic values and morality, both in the learning processes and personality of the students (Berghout, 2011). This is in line with what Ahmad, Othman and Ismail (2012) mentioned that man as a vicegerent of Allah has the obligation to submit to Divine commands, religious laws and moral virtues. Besides that, even though language sometimes is viewed as a barrier in learning, the importance of Arabic as the language of al-Qur'an and civilisation cannot be denied. Al-Attas explains "language, thought and reason are closely interconnected and are indeed interdependent in projecting to man his world view or vision of reality" (Kirmani, 1989).

The integration of knowledge cannot be completed without the incorporation of remembrance of Allah (*dhikr*), thought (*fikr*), as well as actions (*amāl*) (Surajudeen, Zahiri & Mat, 2013). In addition, the curriculum and syllabus of the knowledge should be imbued with *tadabbur*, *tafakkur* (Baba et al. 2015) and *syukr* (appreciation). These elements are mentioned in the al-Qur'an and practiced by the Prophet (SAW), therefore it can encourage dialogues and healthy debate among the educators and students. *Dhikr* is a remembrance of previously given knowledge whereas *fikr* is the pursuit for knowledge through the *ayat* (signs) of Allah SWT. Meanwhile, *Shukr* in the Qur'an denotes rather a mental state and attitude of doing and acting (*'amal*) (Azram, 2011).

Methodology

This study involves two main strategies. The first stage was to develop a standard tool or technique that can be used to Islamize science textbooks effectively. The development process involved mainly research works, basically by studying related literatures and findings of previous studies that are relevant to the scope of this research. Besides that, the development stage also involved active brainstorming sessions, discussions and meetings among the authors as well as fellow academics. At this stage, the end product (tool) was still a draft and looked more like a guideline rather than a tool or technique.

The following step was to develop a template of Islamic integrated science textbook by applying the newly developed tool. Instead of Islamizing the entire science textbook, selecting a chapter of a science textbook as a template would be a more practical option at this stage. Moreover, the structure and elements of each chapter in a typical science textbook normally does have not much variation. In this study, Chapter 3 of Physics textbook (Volume I) used at the Centre for Foundation Studies (CFS), IIUM called The Laws of Motion, was selected as the template. CFS is selected since CFS is the main entry centre for engineering students at IIUM. Even though the tool has a universal character (can be used universally), this case study is however limited to the Malaysian education system and local learning environment only.

During the development activity, meticulous and continuous revisions were conducted specifically to check on the relevancy of the proposed Quranic verses and Islamic inputs. Additionally, other aspects such as technical contents and student learning time were also taken into account. Concurrently, the developed tool has been improved continuously during the development of the template. At the end of this stage, eventually the newly developed tool was finalised and was named as ENRICH Tool. The chapter which was used as the template, which is the finished product of the tool was also analysed and compared with the original.

Results & Discussion

In this section, the proposed ENRICH Tool for steering the Islamization of science textbook task will be presented and fully discussed, including the developed template as the outcome of this attempt.

Development of the ENRICH Tool

After analysing literatures and perspectives from various scholars and academics, following by developing a template of integrated chapter (Physics), finally a standard technique of so called the ENRICH Tool has been created. The aim to develop the ENRICH tool is to guide the educators to systematically Islamize the existing Western based science textbooks and eventually produce Islamic integrated science textbooks. This mean that the approach of this tool is by improving the current textbook and not by developing from scratch. At this point, this tool is more practical to be applied chapter by chapter and rather than to Islamize the entire textbook in one single cycle. ENRICH Tool consists of six main steps as described in its process flow in Figure 1 and elaborated in detail tasks in Figure 2.

Figure 1: The ENRICH Tool - Process Flow

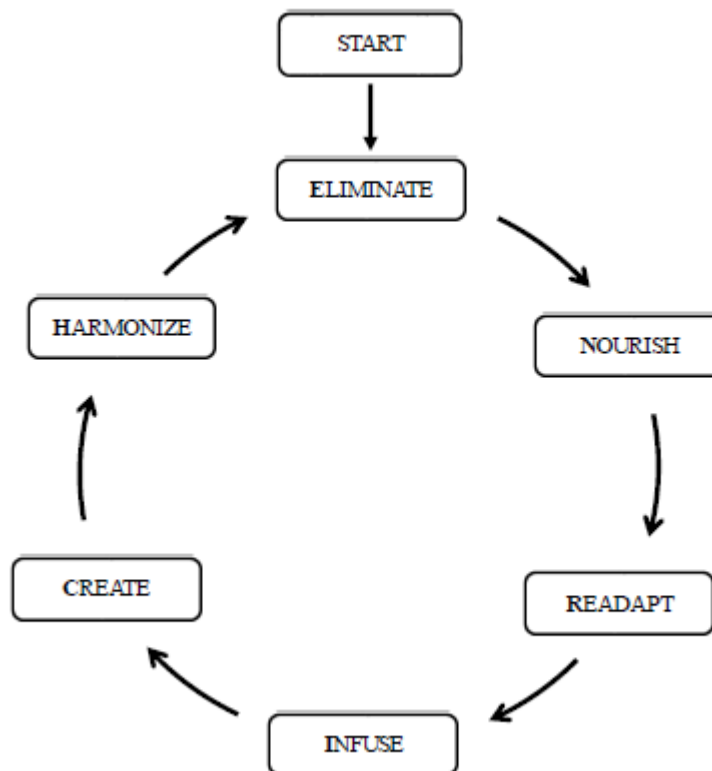


Figure 2: The ENRICH Tool - Detail tasks

Step	Tasks
E ELIMINATE	(1) Identify and eliminate (de-westernization & de-secularization processes) :
	i. un-Islamic concepts which contradict with Tawhid and al-Quran & Sunnah (eg. nature, atheism, Darwinism)
	ii. points that glorify western scholars, history and civilization
	iii. un-Islamic contents (eg. pictures with uncovered <i>aurat</i> , card game)
N NOURISH	iv. Western contents (eg. festivals, culture, sports etc.)
	(1) Nourish with Tawhidic paradigm :
	i. Relate the concept, laws etc. to the Oneness and Greatness of Allah SWT
	ii. Insert the names of Allah (Asmaul Husna), where necessary & relevant
R READAPT	iii. Insert the verses from al-Quran and hadith, where necessary & relevant (there are about 600 verses that encourage/challenge the human beings to think)
	iv. Always state the Oneness of Allah (Syahadah) and deny polytheism and atheism
	(1) Rename : • Western based concept/names with universal concept/names, where applicable
I INFUSE	(2) Replace • un-Islamic and Western contents with Islamic & Asian/local contents
	(3) Readapt the content with Tawhidik & Islamic approach
	(1) Insert and glorify Muslim scholars, history and civilization, where appropriate. (Create box if necessary)
C CREATE	(2) Infuse related Islamic Input/Values, where applicable (eg. Akhlaq, Do'a)
	(3) Insert Key Qur'anic Term Box, where appropriate.
H HARMONIZE	(1) Create Dhikr Fikr Shukr (DFS) Box where related and applicable
	(1) Harmonize: • the content: must be well balanced (eg. theory-application), and Holistic • the arrangement of topics, sub-topics • Format: Figure, Table, Chart, text font & size etc.

The first three steps in the ENRICH Tool are Eliminate, Nourish and Readapt. These steps are very crucial in the Islamization of science textbook approach where both processes of desecularization and integration of acquired ('aqli) and revealed (naqli) sciences are involved. These steps might be applied concurrently and can be implemented by firstly identifying the concepts which contradict with tawhid and revelation as well as contents that excessively glorify western scholars, history, culture and civilization. The concepts and contents, subsequently must be omitted and replaced with tawhidik paradigm, by relating the concepts, principles and laws with the Existence, Oneness and the perfection of Allah SWT in creating and governing His creations. To support this tawhidik perspective, Qur'anic verses and Hadith can be inserted where applicable. Furthermore, the concepts can be related with the Names of Allah (Asmaul-Husna) where relevant. The purpose of this input is to highlight the perfectness of the characters of Allah behind the wonderfulness of the creation of the physical world. By implementing these first three steps, the dichotomy between science and revelation in the contents can be successfully separated and abolished and eventually fresh contents from tawhidik perspective are established.

Meanwhile, in the Readapt step, the scientific principles and laws in the textbooks are suggested to be renamed in order to incorporate a more universal outlook and reduce the Western bias. For instance, the Newton's First Law (Motion) can be renamed as the Law of Inertia. This action does not mean that we do not appreciate the contribution of Western scholars, but to make it neutral and to appreciate all scholars who have contributed to the discoveries. However, the most essential reason for the renaming is to show that the principles were only discovered by those scholars, but are created and governed by Allah SWT, the One and Only God. Nonetheless, to avoid confusion since the principles have been used since decades ago and recognized globally, the original name can be put in bracket as reference. Besides the principles, the same drill goes to other contents such as pictures, examples and such. The contents can be replaced by inputs that are more Islamic and local friendly. This will more attractive and effective to the educators and students in the teaching and learning activities. This Readapt step basically aims to rewrite the textbook from the tawhidik and Islamic perspective as well as incorporating local and cultural adaptation.

The forth step is Infuse. Infusion means to instil other Islamic inputs into the contents, especially History (contribution of Muslim Scholars), Islamic Values as well as the Arabic language. As explained in the literature review, after the process of infusion of tawhidik and revelation, history is the most highlighted element by many scholars and academics in IOK. Most of science textbooks highlight and glorify the contribution of non-Muslim scholars especially from the West. The contribution on Muslim Scholars, unfortunately were rarely emphasised. In this step, efforts must be put to find trustworthy historical references

to explore the discoveries of Muslim scholars and glorify their contribution. Again, this effort was not to dishonour the contribution from the West, but to reveal the facts and appreciate the Muslim contribution in the world of science.

The next element to be infused in this step is Islamic values. In this stage, the writers need to relate the subject matter with positive values such as constantly striving to be faithful and submit to Allah SWT, appreciate the gift of Allah's creations and make every effort to be responsible and accountable for the scientific knowledge using it for the benefit of humankind. The third element in this step is Key Qur'anic Term. This input is introduced in order to enrich the users' understanding of specific term from the Arabic and Quranic perspective by introducing some scientific terms which are mentioned in the al-Qur'an. For example, *Azواج* is mentioned in few verses in al-Qur'an. This term can be related to many scientific phenomena, for instance, positive and negative charges and action and reaction forces which are both in pairs.

In the Create step, the Dhikr Fikr Syukr (DFS) Box is introduced with the aim of stimulating brainstorming activities and activating the critical thinking of the students. They are encouraged to look at science as a very powerful knowledge with which to study, analyse and appreciate the signs of Allah SWT. The box contains three main components namely Dhikr, Fikr and Syukr and their conceptions are explained as follows:

(a) *Dhikr* means spiritual remembrance. *Dhikr* is a fundamental characteristic of '*Ulul Albab* (those endowed with deep understanding). In this DFS Box, scientific eye-opening facts in regards the topic are instilled. By reading and discussing about the particulars, the students will be stimulated to think and understand the relationship between the physical world and its Creator.

(b) *Fikr* means thinking & reasoning. Following dhikr (remembrance of Allah), fikr represents a mental (cognitive) state of being, implies pondering which lead to understanding the nature of the subject. Thought-provoking questions in regards the topic can be asked in the DFS Box. The questions should encourage and stimulate the students to think in deeply about the behaviours, laws, system etc about the scientific facts, until finally they admit and acknowledge the greatness of Allah SWT in creating and governing the creations flawlessly.

(c) *Syukr* (thankfulness to Allah) is an all-inclusive concept and denotes a comprehensive human attitude. Muslims should thank Allah SWT and also be appreciative of himself and his surroundings. In the DFS Box, the students are motivated to practice *syukr* by thinking positively about the usage of science by subjecting its application to the protection of religion, human life as well as environment against exploitation.

In the DFS Box, astonishing facts and/or stimulating questions in regards to the scientific principles are inserted. For instance, a question about what if the value of gravitational acceleration (g) near the Earth's surface is halved or doubled from its current value (approximately 9.81 m/s^2)? This question will provoke the students' intellect to think about the secret and wisdom behind the way Allah SWT governs gravity and eventually lead them to acknowledge His Existence, Oneness and Greatness and as a result appreciate Him and be more thankful i.e. *syukr*.

The final step in ENRICH Tool is to Harmonize. The process is to ensure that the content is comprehensive and the Islamization elements are well-balanced with the technical contents. In this step, the arrangement of topics, sub-topics and formats can be reviewed and amended. The review and harmonization process might need continuous action during the development process until the writers are fully satisfied with the end product.

Development of the template of Integrated Physics Textbook

The new outlook of Chapter 3: The Laws of Motion as a template of this study was successfully developed by applying the ENRICH Tool as the steering guidance. Even though the chapter was rewritten with an Islamic approach, all of the fundamental Physics principles such as the law of gravity, the laws of motion etc. in the chapter remain unaffected. The principles, however are explained in the ways that clearly show that they do not exist and operate naturally, but are created and flawlessly governed by Allah SWT. The elements of polytheism and Godlessness were replaced by firm clarification that there is Allah, the One and Only God who exists and had created the principles and governs them perfectly. This implies that the knowledge is universal and Islam recognises the knowledge as discoveries of the way Allah SWT governs motions in the physical world. The solid declaration is supported by inserting relevant verses from al-Qur'an. For instance, for sub topic The Gravitational Force, verse 2 Surah ar-Ra'd as following was inserted:

"Allah is He Who raised the heavens without any pillars that you can see. Then, He rose above (Istawa) the 'Arsh (Throne). He has subjected the sun and the moon, each running (its course) for a term appointed."

This verse strongly indicates the existence of gravity, created and governed by Allah SWT. The function of the gravity to connect the heaven and other components of the universe is also stated. By inserting this kind of scientific verse, the educators as well as students can relate the knowledge to the revelation, as a result will strengthen their faith to Allah SWT.

Meanwhile, several Physical laws of motion were renamed to make them more universal. For instance, Newton's Law of Universal Gravitation has been renamed The Law of Universal Gravitation. The original name was retained in a bracket as a reference and to avoid confusion. Besides that, accompanying pictures that highlight western lifestyles were replaced with pictures that highlight Islamic and local cultures.

The chapter was also infused with the history of Muslim contributions to the knowledge, for instance the works done and hypotheses made by Ibnu Sina and al-Baghdadi regarding the law of motion. In the summary, the readers are reminded to perform their duties as Muslims, by submitting to and obeying Allah, and to become a harmonious part of the whole universe participating in the glorification of Allah. A few key Qur'anic Terms were also inserted in the sub topic the Third Law of Motion. One such example is *Azwaj* (pairs). This term is mentioned in a few verses in the Qur'an and in this case, can be related to the existence of the Action and Reaction forces, which are always in a pair.

There are five DFS Boxes created in this chapter. Most of the boxes contain stimulating and thought provoking questions which compels the readers (students) to ponder. For example, under the sub topic Friction Force, the students are asked to imagine what would happen if the entire world existed without friction. Following this, the consequences were discussed and finally the box was ended with a conclusion that Allah SWT has created friction with many benefits for humans. This will encourage the readers to think meticulously about every creation and laws that Allah SWT have created and eventually appreciate Him for the mercy.

This template is the first product of the ENRICH Tool, as a result, the outcome is definitely still far from perfect. However, in developing this template, the tool managed to guide the involved writers to execute the Islamization process in more systematic and standard method. The contributions of various experts in the team is vital in to ensure the success of this endeavour.

The way forward

This effort to introduce a viable method to standardise the process of developing Islamic Integrated science textbooks is still at a very early stage. Both the ENRICH Tool and the template are yet to be proven successful in the classroom. The template should be used in the teaching and learning activities as a pilot test and the feedbacks from both educators and students should be analysed further. The ENRICH Tool, meanwhile needs to be applied to Islamize all chapters in the Physics textbook, Volume I involving the current educators at CFS. With this effort, the ENRICH Tool can be improved continuously in terms of the processes, inputs, tasks as well as references. Furthermore, the development activity can be expanded to other science textbooks such as Chemistry, Biology and Mathematics as well as Engineering subjects. Meanwhile, the lacking of educators who are experts in both subject matters and revealed knowledge must be addressed. In short term, the deficiencies can be overcome by conducting continuous training programmes to the educators. In the long run, the university, kulliyah and centre must strategize a long term plan to develop such experts.

Conclusion

The development of the ENRICH Tool in this research is an attempt to address the unviable technique to execute the Islamization of existing Western based textbooks in the science discipline. With the newly developed tool, a standard and consistent approach of producing integrated science textbooks can be implemented. This is also to ensure that the developed textbooks will be in line with the goal of Islamization of Knowledge (IOK). By applying the ENRICH Tool, a template of integrated chapter has been developed. Without affecting the learning outcomes, the chapter has been transformed to be more Islamic friendly by eliminating foreign elements and infusing main Islamic inputs such as tawhidik, revelation, history and values. This effort cannot be stopped here but continuous efforts must be engaged in order to improve the tool and as a results, the developed integrated textbooks can also be improved.

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