

BIOKIDS: AN INNOVATION FOR INTEGRATION OF NAQLI AND AQLI KNOWLEDGE

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Abstract: *Biology is a branch of science that deals with living organisms and vital processes. This knowledge such as human creation is mentioned well throughout the Quran. One of the miracles in the Quran is that it describes accurately the embryonic stages during creation and formation of a fetus. Little did the recital knew about embryology, a medical terminology for human development in the mother's womb. Therefore, it is important to relate the science of Biology and Quran which meets the physical and spiritual needs in order to produce a balanced holistic generation. This concept is known as integration of naqli and aqli that combines the revealed knowledge and modern sciences. Therefore, this study aims to introduce and discuss a tool named as "Biokids" courseware that helps the children to understand more on Biology with the reflection of the integration of naqli and aqli knowledge. This study involved qualitative method, which is collecting data obtained by conducting a review of Quranic verses that is related to the area of knowledge. This effort is hoped to attract kids to learn more about Biology; as the interactive courseware provides new method of learning to people especially those at young age who would love to have more active learning environment. Future research may also be focused on designing and developing an interactive courseware for Biology subject in collaboration with Biology teachers and educational professionals.*

Keywords: *Biology, Naqli, Aqli, Integration*

Introduction

The Creator has asked us to study and try to explain the signs of creation around us. A verse in the Quran refers to us in the following manner: “Those who remember God, standing, sitting and lying on their sides, and reflect on the creation of the heavens and the earth: ‘Our Lord, You have not created this for nothing. Glory be to You! So safeguard us from the punishment of the Fire’” (Surat Ali Imran: 191) (Harun Yahya, 2004). Therefore, there is a need to study and examine natural occurrence in our world, such as the rain, plants, animals, birth and geographical landmarks.

Quran is the main source that contains guidance for all mankind. It is scientifically more advanced than the present scientific knowledge as there are more than six thousands of signs in the Quran of which more than a thousand deal with science. The use of advanced technology nowadays have proven many of the facts that are already present in the Quran from over 1400 years (Zakir Naik 2000). More scientist has embraced Islam as they go deeply into their studies, they found that there is no way that the creation can evolved on its own. There must be a Creator who organized the complexity of the amino acids in deoxyribonucleic acid (DNA) for example. As the molecular biologist are discovering that not all human genome are being used for producing hormones and proteins, they keep asking what are the function of the other genes? Is it possible that these genes are going to be used as our other feature in the afterlife? More and more questions arises in every single discovery. Only Allah knows, and He specifically told us to investigate more. We believed that this is also an act of soleh Muslims.

Biology is a knowledge existed in the Quran which deals with living things, both in the animal (fauna) and plant (flora) kingdom. Scientific progresses has interpreted some hidden meaning of some Quranic verses about biology. For example, Allah has made it clear in the Quran that animals were created from water by the following verse: “And Allah has created every animal from water” (Surah An-Nur: 45). Modern research nowadays has revealed that cytoplasm, the basic substance of the cell is made up of 80% water. Most organisms consist of 50% to 90% water and that every living entity requires water for its existence (Zakir Naik 2000). The jellyfish comprises as much as 95% of water, whereas up to 60% of the human adult body is water. According to Mitchell et al (1945), in the Journal of Biological Chemistry, the brain and heart are composed of 73% water, and the lungs are about 83% water. The skin contains 64% water, muscles and kidneys are 79%, and even the bones are watery (31%). In this paper, the chemical composition of the adult human body and its bearing on the biochemistry of growth is presented (Mitchell et al, 1945).

In Surah Taha, Allah said that: “... and it is He who sent down rain from the sky and with it brought forth a variety of plants in pairs” (Surah Taha: 53). Scientists have found that plants have both male and female parts. People also know that fruit comes from plants that have sexual characteristics even when they come from unfertilized flowers like bananas. Surah ar-Ra’d revealed the discovery with the following verse “...and of all fruits (God) placed (on the earth) two pairs” (Surah ar-Ra’d: 3) (Maurice, 1978). As in all sexually reproducing organisms, mating in plants results in offspring that contain genes from both parents. Unlike animals, plants cannot seek each other out. They must rely on wind, water, or animals to move pollen between plants (What is Pollination? n.d., para. 2).

The history witnesses that Muslim scholars also made contributions in biology. An Islamic scholar, Al-Dinawari is one of the leading botanists and his work, ‘The Book of Plants’ was a

landmark book, earning him the epithet, ‘The Father of Islamic Botany’ (Martyn Shuttleworth, 2010). Therefore, to study biology is of great importance that benefits not only the subject alone but it reaches across other scientific disciplines and Muslim society. One of the methods for learning biology easily is through Information and Communication Technology known as ICT as it has made information more accessible and changed the way the learners interact with the content (Ida Aryanie et al., 2011). ICT by using computer and the internet eased the burden on the resources needed for the teaching and learning process. It is used as a teaching tool and it is able to solve the problem in learning. Instead of recording the students’ performance and feedbacks, the use of computer also reduce the time and effort required to master in learning materials (Teoh Sian Hoon, 2006). Hence, it is believed that ICT helps the learning process and could improve the understanding. However, this paper will focus on interactive courseware which is an application of ICT tools. The objective of this paper is to introduce and discuss the “Biokids” courseware which will help the children to understand more on biology with the reflection of the integration of naqli and aqli knowledge. This effort is hoped to attract children at young age to study Quran and science.

Research Methodology

This study applies qualitative method by collecting secondary data obtained from literature (Andrew and Ainslie, 2000) of Quranic verses that is related to the area of knowledge which is, biology. The result of this is the development of the “Biokids” courseware which at the same time will promote naqli and aqli integration.

This interactive courseware is guided by the ADDIE (Analysis, Design, Development, Implementation and Evaluation). It is a strategic planning for the instructional design process (Jeff Clay, n.d). ADDIE is a five-phase systematic model and each phase represents a series of tasks that help to ensure development efforts stay on tract, on time, and on target (Norasiken et al., 2012). The steps as following:

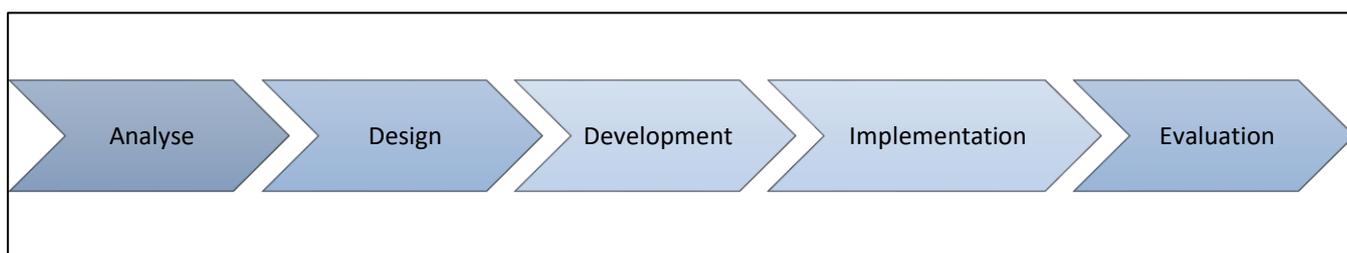


Figure 1: Addie Model

- 1) **Analysis:** In this phase, needs analysis is conducted. The designer determines the audience’s needs, existing knowledge and any other relevant characteristics (Ida Aryanie et al., 2011). The system is analysed and the problems are also described.
- 2) **Design:** This phase is a determination process of how the information is going to be learnt. The designer determines the development strategy in accordance with the data obtained during the analysis phase and how the objectives will be reached is clarified (Selay and Buket, 2008).

This courseware should attract the attention of consumers which is included with several graphic elements that are appropriate for a multimedia presentation designed to get

attention of the users. Adobe Photoshop CS6 has been used to structure the interface design of the courseware. The images that will be used in interface were edited as a png format. The voice of Quran recitation is recorded by audacity software while the audio is edited using Cyberlink PowerDirector 10 and Cyberlink WaveEditor.

- 3) **Development:** The development phase involves preparing all of the components of multimedia (Selay and Buket, 2008). Adobe Flash Player CS6 is the main software in developing this application where all graphics, audio, video and text are integrated in the Flash animation clips to produce powerful interactive features.
- 4) **Implementation:** The purpose of this phase is to introduce Biokids courseware to the target audience. The delivery environment should be effective and efficient for implementation of Biokids.
- 5) **Evaluation:** This phase is the end stage of the project that will determine whether the instruction is sufficient enough in getting the most effective outcome. Biokids courseware will be evaluated in order to see up to what extent the design meets the learning objectives and the needs of learners.

Interactive Courseware: The Malaysian Experience

The use of multimedia-based in education is rapidly gaining popularity in Malaysia. Multimedia courseware can be defined as an interactive communication process based on the use of computer technology inclusive of combination and integration between text, graphics, sound, animation and video (Mohd Nor Hajar et al., 2013). It became a great attention and necessity in a software as it helps a lot in the process of teaching and learning. Malaysia constantly invests in computer technology for education because of a strong belief that it will improve learning outcomes. E-learning has been developed in Malaysia under the educational technology programs offered by the government through the Malaysian Ministry of Education (Norfadilah, 2015).

Malaysian Ministry of Education has adopted multimedia-based learning for a pilot project entitled Smart School Project in 1998. This project aims to improve Malaysian Primary and Secondary students learning attitudes and achievements and also to enhance teachers' performance by the end of 2020 (Norfadilah et al., 2010). The opportunity to use interactive courseware were given to the teachers in selected Smart Schools in teaching Malay, English, Mathematics and Science subjects in the classroom. Laptop also supplied by Malaysian government to each teacher to ensure that the supplied interactive courseware can be utilized successfully. However, interactive courseware should not be expected to replace teachers' roles in delivering knowledge but must be seen as a tool for increasing the students' involvement in teaching and learning (Norfadilah, 2015).

Interactive courseware is a kind of teaching and learning method that motivate students to learn and encourage them to participate actively. Toward the goal, this study aims to introduce Biokids courseware which is an interactive courseware that helps children to learn biology in an effective environment and fun learning. At the same time, children is able to understand the Quranic verses, in the light of established scientific discoveries through a courseware. This innovation can be said as the effort of integrating naqli and aqli knowledge.

Potential of Interactive Courseware in Promoting Naqli and Aqli Knowledge

The first guidance from Allah is al-Quran following by al-Sunnah. These two sources are granted by Allah to man in order to achieve two types of knowledge including the knowledge through revelation and prophet as well as the acquired knowledge learned through experiences and when man strives with his mind (Al-Migdadi, 2011). The knowledge through revelation is naqli knowledge which came from authentic sources such as Al-Quran and Sunnah of Prophet Muhammad. Meanwhile, the term aqli or non-revealed knowledge also known as worldly knowledge means logical and intellectual interpretation of any given matter (Siti Salmiah et al., 2016). The combination of naqli and aqli knowledge is an effort to create a society that has balance between worldly and the hereafter, which is a generation that has the love and heart for al-Quran and master in modern knowledge. It matches with the vision of National Education Philosophy (FPK) and Islamic Education Philosophy (FPI) which is to generate a balanced generation from the aspects of physical, emotion, spiritual and intellectual (Zetty Nurzuliana Rashed et al., 2015).

The evolution of technology has brought the world closer and the access and sharing of information became easier. The use of ICT such as computer provided many opportunities and it is a part of society. Thus, it can be efficiently utilized in promoting Islamic teachings. Muslims should use this new technology, as well as to put their efforts to learn and comprehend Islamic teachings. The efforts to bring the beneficial new developments into the Muslim society, develop and perfect them is a communal obligation (fard kifayah) (Abdullahi, 2013). Interactive courseware is a technology and it should be used as an effort to introduce naqli knowledge in science. For that reason, Biokids courseware is created for children to learn biology and Quran at the same time.

Discussion

Biokids is an interactive courseware created for children particularly as it is important to appreciate the opportunities in cultivating interest to learning. The discussion about Biokids in this paper will be divided into objective, limitation of project, project feature and how Biokids works.

Objective

Online multimedia courseware- Biokids aims to teach children about biology via online source. They can learn through the system and play the education games that is provided in the system. Hence, the kids will be more interested to learn from the games. The child can also learn and understand the Quranic verses related to the biology topics. Thus, the kids will learn science as well as the Quran through animation, video, graphic, sound and texts. This multimedia project is hoped to increase children's interest to learn more about sciences and Quran.

Limitation of Project

Biokids courseware will focus on general knowledge about biology for kids and its Quranic verses. The kids can choose any of four topics they like to learn. It will be the alternative tools for kids to learn independently and do practices through the games that is provided in the system. The four main topics in Biokids are botany (the study of plants), physiology (how living

organisms function), zoology (the study of animals) and embryology (the study of genes and embryo).

Project Feature

Firstly, this project is multimedia-based learning which is flexible without depending on teachers, books or in class. Traditional learning needs students to allocate specific time for learning, following to the teachers or schedule whereas interactive courseware can be used in various places such as at home, on the bed or while travelling. In short, the learner will easily enjoy using it any time and at any places. Secondly, the courseware is an interactive learning. It is mutual action between the learner, the learning system, and the learning material. There are also video, music, graphics, texts, and games which make the learner more interest to learn. More cartoon is used and kiddie style is used on sound narrator to attract the kids. The children will return to the program and play it again and again because of the exciting, challenging and fun feeling. Based on these reasons, with the interactive learning elements, the proposed multimedia courseware of Biokids can help kids to understand the content easily compare to when they read books.

Thirdly, it is cost-effective. Although multimedia courseware has its own development costs, but it can save a lot on expensive and time-consuming travel and transportation, tuition and class monthly fee, and other expenses related to the program. Fourthly, it is user-friendly as it brings ability to navigate through material in whatever ways. It has options which are three language consists of Malay, English and Arabic language as well as icon and button that are simple to use. Lastly, this project integrates naqli and aqli knowledge since it combines biology knowledge and revealed knowledge that is Quran in order to attract the kids to learn and understand Quran. It means they do not ignore revealed knowledge in the future while mastering modern science.

How Biokids works

The multimedia-based courseware will cover four topics which are botany, physiology, zoology and embryology. In each topic, the proposed courseware will teach the children all of the information relating to the subject with the explanation from the Quran. Animation, sound, text, video and graphic will be included in the design of user interface. The needs and psychology of kids are important elements to be analysed in designing the interface. Kids like to play, thus there are some flash games that have been developed for them such as quizzes, puzzles, crosswords, and other interesting educational games. In order to become more attractive, sound effects will be added appropriately with the situation such as special sound for wrong and right answer. In addition, the background for Biokids will be designed relating to the topic. For instance, the background for botany will be about types forest and for zoology is on different kinds of animals. Besides, the voice teaching also will guide the kids to click the next station, play and stop button and others. Kids can click on voice teaching to listen and pronounce the word correctly and to listen to the explanation such as the embryonal stages during creation and formation until delivery. The 'home' button is to go back to the main page, 'Previous' and 'Next' button use to forward or back and all these three buttons; 'Home', 'Previous' and 'Next' will appear in each page.

Quranic verses are important part in every topic. Once the kids click on the "Enjoy the Quran" button, they will listen to the Quran recitation and its translation with the help of video, graphic

and animation to increase the understanding. Based on the research, there are 46 verses about biology in the Quran and the most verses came from the last juz in the Quran which is juz 30 that are surah al-Naba', al-Nazi'at, al-Infitar, al-Tariq and al-Tin. Meanwhile, surah al-An'am and surah al-Tariq contained most number of verses about biology. Kids can also select "Quranic Games" to play the fun flash games in order to attract them to enjoy the Quran in learning biology. Three languages will be prepared to ease them to use Biokids consists of Malay, English and Arabic languages. By listening and enjoying the Quran lesson in Biokids, kids can learn how to recite Quran correctly and understand the meaning at the same time appreciate the miracle of Quran.

Conclusion

In conclusion, Biokids is created for the interactive teaching and learning of biology with the use of technology. Interactive courseware provides alternative of learning to the kids who love to have fun learning environment. Colours, animation, graphic, video, text, sound and music will attract them to explore more and increase their understanding in biology and Quran. Biokids courseware is believed to spread biology knowledge among kids since its interactive features is suitable to children nowadays which are flexible, interactive, user-friendly, as well as integrating naqli and aqli knowledge which aims to generate a balanced and holistic person. The main element in Biokids is Quran which is used to explain four biology topics which are botany, physiology, zoology and embryology. Hence, Biokids has the potential to introduce Quran to children at young age and show the miracle of Quran in life. It is hoped that Biokids is able to produce a holistic generation who is master in Quran and biology. Future research may be focused on designing and developing an interactive courseware for Biology subject in collaboration with Biology teachers and educational professionals.

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