



A Conceptual Framework for Arabic Language Courseware Using Persuasive Design

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Abstract— In the rapid technological development, the courseware technologies have gained an increasing use in the field of education. Interactive learning is a more hands-on, real-world process of relaying information to children. Through technologies, interactive learning empowers children to explore and participate in the conversation. This study attempts to use persuasive design to understand the human behaviour change. This paper described the conceptual framework of interactive learning using persuasive design for young children to learn Arabic language. The framework was designed as a first step in attaining the objective of an interactive courseware, which is to improve the children learning process. The courseware focused on Book 1 of the IQRA series. This conceptual framework consists of four different concepts to support the learning process which are: (1) e-Flashcards (2) Persuasive Design (3) Cognitive Theory of Multimedia Learning (CTML) and (4) Multimedia principles. This courseware is an alternative way to persuade young children to learn Arabic characters one by one and then learn using the IQRA technique. Hopefully, with this interactive learning model will help the children to improve their ability to recite the Quran effectively and efficiently.

Keyword: Arabic language, Courseware, Flash Cards, Persuasive Design, Multimedia Learning.

I. INTRODUCTION

Early childhood is the most important life stage in the life of human where at this stage the brain development progress is

essential. Thus, the ways to help a child to be alert and to have good nutrition are essential for development during the first three years of his/her life. A child's brain, specifically the first three years, is more sensitive to the effects of the external environment and affects a child's intellectual, social and emotional development rapid growing. Whenever a child is alerted early, his pace of development and learning increased. The language and intellectual development of the things is particularly important during the period ranging from six months and the first three years. When children spend early years of their lives in an environment with less alert or less support in both emotional and physical, the development of the brain is affected, leading to growth retardation intellectual capacity, social and behavioural [1].

Children since six months are glowing to explore technology around the home and they are possessed by sound and music, and love interactive musical instruments. While they start using computer at age of three years [2] they can play games, access Internet, watch YouTube and even download music. Longitudinal studies demonstrated that children who enrolled kindergarten programs excelled in their peers who did not attend kindergarten in three measures; Intelligence Quotient, adapt psychological and behavioural, and the educational attainment of reading, writing, math, language and spelling [3]. Indeed, the positive impact of the enrolment in kindergartens in the lives of these students exceeded the teenage; longitudinal studies revealed the positive impact of kindergartens in increase the graduation

rates, improve the employment opportunities and engage in the labour market [4]. Therefore, the attention of pre-primary education stage become one of the modern global trends, as not take advantage of this stage or weakness may lead to losses and negative consequences on the child's personal life and education, thus economic losses to the state. Hence, the care of the kindergarten objectives, and its programs, was begun globally.

The stage of early education has received more attention from the governments in the developed countries and many of developing countries such as Saudi Arabia, Jordan, Palestine and others. For instance, the kindergartens in Saudi Arabian aim to build the capabilities of the child in linguistic, moral, physical, religious, and others. In this stage, children learn the Arabic alphabets and numbers; they learn how to pronounce and write them. Furthermore, the children learn some of short Sura of the Quran in order to configure the Islamic direction based on uniformity which corresponded to encroachment. In addition to accustom the child to etiquette, facilitate the acquisition of Islamic virtues and care of the child's moral, mental and physical development according to the requirements of Islamic law.

On the other hand, the Early Childhood Care and Education (ECCE) in Malaysia starts to teach children Malay and English alphabets in the age of five years, a later age in children's education. For Islamic education, children should join Islamic Kindergarten which teaches children only read Arabic alphabets in the age of five years. On the other hand, the Ministry of Education in Malaysia has been introduced IQRA method in primary schools since 1995 for learning the Qur'an. According to Hasan, some teachers in primary school said that the implementation of teaching IQRA method in National Schools has many weaknesses which results in a number of students being unable to read the Qur'an, even after six years in primary school [5].

It is obvious that the Arabic language is very important for Muslims around the world because it is the language of the Qur'an. In addition, it is Prophet Mohammad, who is the last of the prophets, language. It is, therefore, the language in which that preserved his sacred traditions. Thus, Arabic language is the basic language of Islam sources, the Qur'an and the Sunnah [6]. It is essential for Muslims to learn Arabic language in order to understand the Qur'an, the Sunnah and other literature on religious topics available in Arabic language. On the other hand, Arabic language is a bit complex and deep because of the entire meaning of the word or the phrase can be changed for a minor difference in the pronunciation and typing. Thus, Muslims are serious in teaching Arabic language to their children since childhood, in order to facilitate their recitation of the Qur'an [7]. Regarding to above-mentioned discussion, this study focuses on designing an interactive learning model in order to learn Arabic characters for children.

This paper is divided into six sections; section 2 displays the importance of using information communication and technology (ICT) for young children. Section 3 shows an overview of interactive learning and the steps for designing persuasive technology. Section 4 defines IQRA method and

some applications that have been developed to teach children it. Section 5 displays the components of proposed framework for Arabic language using persuasive design. Last section concludes the paper and future works.

II. INFORMATION COMMUNICATION AND TECHNOLOGY (ICT) FOR YOUNG CHILDREN

Children have arrived into a technological world which plays a significant role in their growth and development. Various studies have proven that a period of experience-based brain development starts in individual life from conception to age 5 and as a critical stage for the programming of neurobiological pathways that can affect health, learning and behaviour during the entire life cycle [8]. Fig. 1 shows that the most sensitive period for the development of the sensing pathways is during the first few months of life, and the most sensitive period for the development of language pathways is around the third trimester of the first year and extends beyond the fourth year of life [9], while it is estimated that around 200 million children under five years of age in developing countries are not reaching their developmental potential [10]. From here the need arises to implement high-quality early child development programs during the early stages of life.

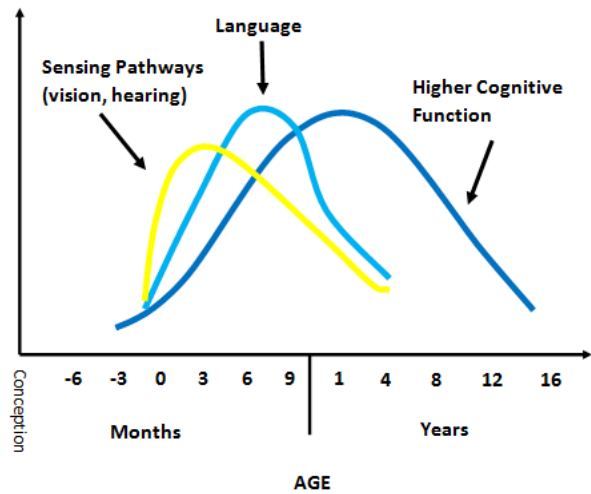


Fig. 1: Phases of human brain development [9].

Children accept technology as part of their life and they very quickly learn to use it. At as early as six months they have started to explore technology around the home and they are possessed by sound and music, and love interactive musical instruments. Even though the best teacher is a truly interested adult and the best friend is a playmate to share and have fun with, technology can provide a rich learning tool for children to use. Children love its 'magic' qualities, where things can happen at the touch of a button [11]. Many of learning opportunities can be provided by playing children with a computer. The best computer-based learning experiences come from a truly worthwhile activity which allows children

to be in control and also some software also allows children to experiment and try things out [13].

III. PERSUASIVE DESIGN

Persuasive design is the process of creating an interactive learning to change attitudes or behaviours of users through persuasion and social influence, but not through coercion [14]. Baxter [15] fits the major stages of the evolution of software design as follow:

- **Human-computer interaction** is about paying attention to people and their relationship with computing.
- **Information architecture** is about making things findable.
- **Interaction design** is about making things usable.
- **Content strategy** is about making things meaningful.
- **Experience design** is about making things seamless.
- **Persuasive design** is about making things influential

In addition, he summarizes how this evolution is reflected with respect to its effect on behaviour. The successfully design of interactive learning model requires an understanding of children’s current behaviours and attitudes toward the interactive learning as shown in Fig. 2. In this particular case, where we desire to teach young children Arabic characters, it is critical to know how children learn about Arabic and how they use the technology in learning. After answering these questions, it is important to make the learning interactivity feasible for young children by using persuasive design which leads to influence the behaviour of children in learning.

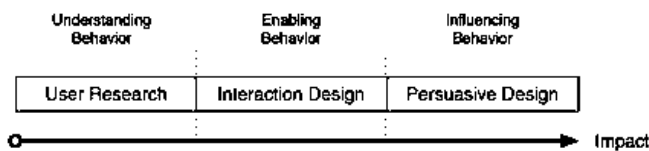


Fig. 2: Impact of software design evolution [11]

Fig. 3 shows that, a trigger can take many forms such as an alarm that sounds, a text message, and other. Whatever the form, successful triggers have three characteristics: notice the trigger, associate the trigger with target behaviour, and it happens when we are both motivated and able to perform the behaviour.

Fogg [17] proposed eight steps for designing persuasive technology. Since this study attempts to produce IQRA courseware that can persuade young children to use computer technology as their learning aid, the persuasive design steps were considered as guidelines to this study. The steps are as follows:

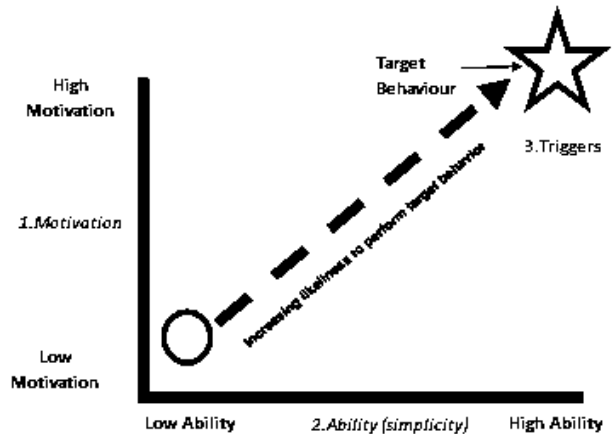


Fig. 3: Fogg behaviour model [16]

- **Step 1** - Choose a simple behaviour to target: the design should provide the smallest, simplest behaviour that matters.
- **Step 2** - Choose a receptive audience: in the persuasive design process involves choosing the right audience for your intervention.
- **Step 3** - Find what is preventing the target behaviour: the design team must pinpoint why people aren’t performing the behaviour.
- **Step 4** - Choose an appropriate technology channel: choosing the best channel for the technology intervention. Which channel is “best” usually depends on each factors.
- **Step 5** - Find relevant examples of persuasive technology: search for examples of successful persuasive technologies that are relevant to their intervention, as defined in the previous steps.
- **Step 6** - Imitate successful examples: the next step in the persuasive design process is to imitate what’s working in the successful examples gathered in Step 5.
- **Step 7** - Test & iterate quickly: test various persuasive experiences quickly and repeatedly.
- **Step 8** - Expand on success: scale up the success.

IV. IQRA LEARNING METHOD

IQRA is a method that is structured as an attempt to adapt or modify an earlier method (al-Baghdadi) in order to achieve the goal of studying the Quran in a short time and quickly. IQRA Method is founded by al-Marhum Ustaz Haji As’ad Humam who had taught the Quran since 1950 and founded this method through trial and research [18].

The Ministry of Education in Malaysia has introduced IQRA method for Islamic primary schools since 1995 [5]. Students are required to follow the Quran for the first six months of the first school term. In addition, Islamic and Moral Education

Unit Department of the Federal Territory of Kuala Lumpur in collaboration with Islamic Da'wah Foundation of Schools (MAKDIS) has been trying to publish teaching modules IQRA to guide the teachers to carry out these methods in their schools.

There are many of video applications on YouTube, which have been developed to teach children Arabic characters and IQRA method, some of Arabic applications display the alphabet linked with animal picture whose name begins with the letter, and some of them display the alphabets linked with songs to facilitate alphabets memorizing for the children. On the other hand, some of the applications for teaching children IQRA method have been developed only reading from IQRA books and some with song to facilitate characters pronunciation. Many of these applications are based on the constructivist method, an approach that nowadays is gaining more and more consent.

JQAF (Jawi, al-Quran, Arab, Fardu Ain) program is introduced in year 2005 to provide a more comprehensive Islamic learning in Malaysian primary school. Whereas, Story Telling for Arabic Language (STAr) courseware was developed to help children to understand the Arabic grammar better and to generate ideas on how to make the Arabic learning progress interesting and suitable with Malaysian school children [19].

i-IQRA, an interactive multimedia mechanism, is developed especially for children who aged between 5 to 8 years old in order to persuade them to learn Arabic characters and finally to read and recite the Al-Quran. It increases the users' interest in learning IQRA and helps the children to better understand the content [20].

EZ-Arabic, an interactive Arabic learning programme, is designed as a virtual learning platform and tools for learning Arabic. It was developed by integrating learning contents in several traditional contemporary text books with several open source web-based applications. EZ-Arabic is especially targeting children learners at all stages in Malaysian primary schools which enables teachers and students access to additional Arabic language learning aids, and complementing traditional learning methods. It increases the motivation and positive perception among children in learning Arabic which is not their native language [21].

MyFirstIqra, a mobile application, was developed by Islamkids media for learning kids Arabic language. It has many features such as learn the basic Arabic letters, beautiful animation to engage learning, learn and sing along with Aisyah, fun, education and easy to use. However, this application is developed only for iPad and iPod touch screen and it doesn't work on other devices such as android or laptops. This limitation increases the inability of using it.

V. DEVELOPMENT OF A CONCEPTUAL FRAMEWORK

This conceptual framework is designed for a courseware that integrates multimedia for learning Arabic characters with persuasive technology concepts and flash card for the young

children. Fig. 4 shows the component of persuasive multimedia design model.

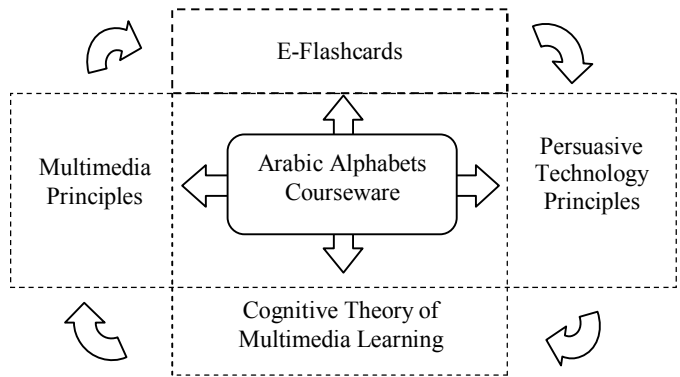


Fig. 4: Conceptual framework for Arabic language courseware using persuasive design

A. E-Flashcards

E-flashcards is one of the best effective methods for helping children to memorize information. E-flashcards are cards that have words, pictures, and/or numbers on vocabulary or phrases on either or both sides [22]. There are two types of flash cards, physical and electronic. In their physical form they are literally pieces of card with a question on one side and an answer on the other. Now with the development of advanced computer technologies, flash cards can be quickly and easily created for use on a personal computer or smart phone.

Since E-flashcards are designed for early learners, only capital letters are used in order to avoid the difficulties in differentiating between capital and lower case letters. E-flashcards also help in improving the visual or the photogenic memory, associating things and comprehension of a child with very simple activities and a child can learn things in a fun way. The development of human brain takes place between the ages of 3 months to 6 years. During this period, a child's brain can absorb incredible amount of information and learn new things at a quick pace.

Method Shichida [23] had developed in 1981, for teaching using flash cards and they state that the cards should be flashed at a rate of 0.5 sec to 1 sec per card. The fast speed of flashing sends strong vibrations to the brain and allows the information to be absorbed unconsciously by the right brain. Hence, it will be very easy for children's brain; especially those who aged below three years, to apprehend information. This also aids baby's brain to develop better and faster [26]. It is essential to bear in mind that flashing e-flashcards is not only for child to recognize or to learn, it is also to stimulate their brain. The end result is that they will remember these things and when they learn them academically in future, they will find it easy to remember, use and spell these words and name these things.

The best way to use e-flashcards is to use them for teaching children the language because of the use of e-flashcards as a potential for vocabulary-building is still widely recognized and it has been shown that, vocabulary flashcards are effective in improving both reading speed and comprehension [27]. Using e-flashcards for teaching young children Arabic alphabets every day at a regular time will imprint the words into child's mind. The repetition of performing daily exercise at the same time each day will help child learn. The best time to perform the exercise is shortly before child goes to bed, however this must be done before the child gets too tired to concentrate [28].

There are many of e-Flashcards software developed for children to learn Arabic alphabets to gain an understanding of the language of the Quran. Some of useful e-flashcards are Arabic Alphabet Flash Cards and My First Arabic Flashcards. These softwares are using interactive audio/visual flashcards.

B. Persuasive Design

Persuasive design steps that are considered in the design are:

Step 1: Two essential behaviours of young children have been chosen to be the target of the design; the sound and colours are adapted in the design of Arabic characters courseware in order to achieve high attention of the young children.

Step 2: This designing model focuses to attract the young children aged one and half year to four years, thus we increases the attractiveness of the design.

Step 3: It is found that, when the ICT doesn't use as a mean to teach children, it may prevent the children learning and may affect negatively on their behaviour. Thus, this courseware is designed for young children to teach them Arabic characters.

Step 4: To teach the young children Arabic characters we design an interactive courseware which integrates with multimedia such as e-flashcards, images, media and so on.

Step 5: In many previous researchers was found some of relevant examples of persuasive technology such as i-IQRA courseware, dyslexia multimedia screening tool and interactive multimedia program which developed cover a topic in mathematics. The most principles which are used in these examples are the Principles of Simulations by using multimedia, the Principles of real-world contexts during every day routines in learning and the principles of attractiveness where the computing technology is visually attractive to target children.

Step 6: We selected i-IQRA courseware as a successful example of using the persuasive technology for learning. The design not only imitates this courseware, new matters such as

Arabic character module which displays alphabets one by one, are added.

C. Cognitive theory of multimedia learning

Cognitive Theory of Multimedia Learning (CTML) is a cognitive science guides to create a computer-based training and multimedia learning effectively. Mayer [29] described CTML as the material presentation using words and pictures, which is associated the method of learning and processing information. It assumes that human information processing consist of visual and verbal processing which have limited capacity [30].

Thus, this study takes into account the CTML to express an effective learning environment to the children. Images, texts and animations of Arabic characters are arranged visually and verbally. The elements will be integrated to help children memorize the Arabic characters long-term. Finally, the researcher hopes to retain more understanding and memory for Arabic characters to the children.

D. Multimedia principles

The Principles of Multimedia Learning: It is required provide a good persuasive impact to the children by using some of the principles. Hence, in Arabic characters courseware four principles are used which are;

- Multimedia principle: best use of words and pictures.
- Spatial contiguity principle: best placement of words & pictures.
- Temporal contiguity principle: best sequencing of words & pictures.
- Coherence principle: less is more.

In addition, the persuasive principles are integrated with multimedia principles and CTML guidelines. The multimedia principles which are used in this designing model are considered by the best use, placement, sequencing of characters, words and pictures. The Principle of coherence, where less pages and suitable arrangement of courseware, is adapted. CMTL guidelines, where graphics, animations and texts of Arabic characters were organized visually and verbally, is considered.

VI. CONCLUSION

This paper clarified the importance of using ICT for young children learning and focused on how persuasive technology motivates children to learn. In addition, some of learning design models and courseware that integrate persuasive technology with multimedia were reviewed to identify the elements that previous researchers considered in their studies and had impact on teaching children different fields. Therefore, a conceptual Arabic language framework was proposed by integrating four technologies that are e-flashcards, persuasive design, cognitive theory of multimedia learning (CTML) and multimedia principles. These four concepts will be implemented in a courseware that can be regarded as an aid to Arabic language learning tool and to

assist young children to gain and explore their language development at early age. The next steps in this study involve the courseware development, the implementation and the evaluation of the courseware.

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REFERENCES

- [1] Geraldine, F. 2007. Children's early learning and development. *Aistear: The early childhood curriculum framework*. Retrieved on 11st March, 2013, http://www.ncca.ie/en/Curriculum_and_Assessment/Early_Childhood_and_Primary_Education/Early_Childhood_Education/How_Aistear_was_developed/Research_Papers/Childrens_learning_and_dev.pdf
- [2] Harris, C., Straker, L. and Pollock, C. 2013. The influence of age, gender and other information technology use on young people's computer use at school and home. *Work: A Journal of Prevention, Assessment and Rehabilitation*. 44(1), 61-71.
- [3] Barnett, W. S. 2008. Preschool education & its lasting effects: Research and policy implications. Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved 13th March 2014, <http://nieer.org/resources/research/PreschoolLastingEffects.pdf>
- [4] Gross P. W., Lewis W. et al. 2006. *The Economic Promise of Investing in High-Quality Preschool: Using Early Education to Improve Economic Growth and the Fiscal Sustainability of States and the Nation*. Committee for Economic Development. Washington, United States, First edition.
- [5] Hasan A. 2006. Powerful Play: Using Edu. Toys in the Iqra' Learning Method for Preschoolers. Thesis Master Design Tech, Uni. Tek. MARA, Selangor. Retrieved on Oct9th, 2012, http://eprints.uitm.edu.my/3645/1/ASROL_BIN_HASAN_06_2_4.pdf
- [6] Zubair K. M. 2012. Importance of Arabic. Retrieved on October 10th, 2012, http://www.khaleejtimes.com/kt-article-display1.asp?xfile=/data/opinion/2012/August/opinion_August4_2.xml§ion=opinion
- [7] Khan M. 2012. The Importance of Arabic Language. Retrieved on October 10th, 2012, <http://muslim-academy.com/the-importance-of-arabic-language/>
- [8] Tinajero A. 2011. Cuba and Early Human Development The Brain & Human Development. Report prepared for the Bernard van Leer Foundation.
- [9] Thompson R. A. and Nelson C. A. 2001. Developmental science and the media: early brain development. *American Journal of Psychology*, 56, 5-15
- [10] Grantham-Mcgregor S. M., Cheung Y.B., Cueto S., Glewwe P., Richter L. & Strupp B. 2006. Developmental potential in the first 5 yrs for children in developing countries. *Lancet*, 369, 60-70.
- [11] Early Childhood Department. (2008). الطفولة المبكرة: أخطر مراحل النمو العقل, Early Childhood: the most dangerous stages of Mind growth. Retrieved in 14th September, 2012, <http://matnas.dabburiya.net/online/matnas-sections/child-development/19-general/184-house-prices-to-fall-9-in-2008.html>.
- [12] Kennington, L. (2010). Young children and technology. Learning together series, 13. Retrieved 25th March 2014, <http://www.early-education.org.uk/sites/default/files/publications/Young%20children%20and%20technology%20%2813%29.pdf>
- [13] Fogg, B. (2003). *Persuasive Technology: Using Computers to Change What We Think and Do*. San Francisco: Morgan-Kaufmann
- [14] Baxter L. 2011. Why Persuasive Design Should Be Your Next Skill Set. *UX Magazine*. Retrieved in 21st November, 2012, <http://uxmag.com/articles/why-persuasive-design-should-be-your-next-skill-set>
- [15] Fogg, B. (2009). A behavior model for persuasive design. The 4th Int. Conf. on Persuasive Tech. 1-7. New York, USA
- [16] Fogg, B. (2009). Creating persuasive technologies: an eight-step design process. The 4th Int. Conf on Persuasive Tech. New York: USA
- [17] Mohd Alwi, Y., Adel, M. A., and Ahmad, K. M. (2003). Keberkesanan Iqra' sebagai kaedah pembelajaran membaca al-Quran., Bangi, Fakulti Pengajian Quran dan Sunnah, Kolej Universiti Islam Malaysia.
- [18] Baharudin, S. I., M. Ismail, I. Nasir, S. (2010). STAR : Story Telling for Arabic Language. Proc. of the Information Retrieval & Knowledge Management, (CAMP), 2010 Int. Conf, 143 - 146. 16-18 March, Selangor, Malaysia.
- [19] Rosmani, A. Abdul Wahab, N. (2011). i-IQRA': Designing and Constructing a Persuasive Multimedia Application to Learn Arabic Characters. Proc. of the 2011 IEEE Colloquium on Humanities, Science and Engineering Research. 5-6 December, Penang: IEEE.
- [20] Sahrira, M. S., Yahayab, M. F. and Nasi M. SH. 2013. EZ-Arabic for Children: A Virtual Learning Resource Tool for Malaysian Primary Schools. *A Journal of Procedia - Social and Behavioral Sciences*. 90, 396-404.
- [21] Diouri, M. (2009). Blending the Old and New Ways of Teaching Tools: Revolutionizing Traditional Arabic Language Learning & Teaching. ARABELE 2009 International Congress on Teaching Arabic as a Foreign Language. Spain.
- [22] The Shichida Method (2008), Superachievers Pte Ltd. A, Retrieved in 25 March, 2013, http://umconference.um.edu.my/upload/48-4/tsm_brochure_2008.pdf
- [23] Nagtegaal, S. and Wittens, S. (2008). Importance of Flashcards. Retrieved in 26th November, 2012, <http://brainykids.wordpress.com/parents/importance-of-flashcards/>
- [24] Broun, L. 2004. Teaching students with autistic spectrum disorders to read. *Teaching Exceptional Children*, V36-4, 36-40.
- [25] Strauss, M. (2010). How to use flash cards to help teach a child to read. Retrieved in 26th November, 2012, <http://www.helium.com/items/1956301-teaching-a-child-to-read-with-flash-cards?page=2>.
- [26] Mayer, R. E. (2009). *Multimedia learning* (2nd ed). New York: Cambridge University Press.
- [27] Yusoff, M. F., Zulkifli, N. and Mohamed F. F. (2011). Virtual Hajj (V-Hajj) - Adaptation of Persuasive Design in Virtual Environment (VE) and Multimedia Integrated Approach Learning Courseware Methodology. Proc of the 2011 IEEE Conf. on Open Systems (ICOS2011). 25-28 Sept. Langkawi, Malaysia.