

The technology of multimedia education essay

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CHAPTER 2

LITERATURE REVIEW

2. 1Introduction

This chapter reviews on past research on related issues is appropriate before developing the interactive multimedia encyclopedia for primary school children. The researchers on related are important to ensure the development of the application is benefiting the children and provides effective learning. Among the topics covered in this chapter are defined of the encyclopedia, the technology of multimedia, interactive multimedia, component of interactive multimedia, active learning through interactive multimedia and children's learning styles.

2. 2Encyclopedias

An encyclopedia provides a written compendium of knowledge consisting of articles concisely, exhaustively and accurately covering topics of interest (Yoon & Eenjun, 2008). Another study by Wolfgang, Michael & Mathias (2006), claims that can encyclopedia provides a rich repository of highly structured and revised information in the form of articles covering specific topics. It contains a wide range of topics and guides on how to do variety things. According to Rene et al. (2009), an encyclopedia covers fascinating sources of knowledge such as history, religion, education, bibliography, living things and much more as they preserve information over the centuries. Expertise in relevant knowledge areas will review and write the encyclopedia information. The information of encyclopedia divided into articles and entries and it was arranged alphabetically, cross referencing and indexing enable

the reader to find any topic relative to another. Encyclopedias are composed of one or many volumes such as the Encyclopedia Britannica and the world's largest Encyclopedia Universal Americana in huge multi volumes (Wikipedia, 2012). The encyclopedia has existed around 2, 000 years ago and the oldest encyclopedia that still exists is Naturalist Historian which was written by Pliny the Elder around the year of Common Era 77 (Wikipedia, 2012). The encyclopedia is established to collect the knowledge and research of preceding centuries to benefit those will come after. Encyclopedia articles or the content were written by text writers who have qualified with an academic degree. Normally encyclopedia was produced in a form of printed books which is referred as traditional encyclopedias and to a digital form such as Electronic Mobile, on-line encyclopedia and CD ROM based encyclopedias.

2. 2. 1Traditional Encyclopaedia

A traditional encyclopedia is in a form of book which is a set of written, printed, illustrated and compiled together. Information that presented in a printed encyclopedia requires some form of hierarchical structure and the method of presenting the information are according alphabetically order by the article title. The traditional printed encyclopedia contains in multi volumes because every update or revised policy of the new encyclopedia need to print in the new volume of encyclopedia book. Therefore the traditional encyclopedias are less favored by readers because of multi huge volumes need to be referred to search information (Yoon & Eenjun, 2008). In line with the advancement of technology, people will go for digital publishing encyclopedia rather than printed books. Therefore, most printed

encyclopedias such as Britannica had moved to deliver in a form of digital publishing in the 20th century.

2. 2. 2 Interactive Digital Encyclopedia

The digital encyclopedia also can be classified as interactive encyclopedia, is a publication in digital form consisting of text and images which are published and readable on computers or other electronic devices. Today's digital multimedia encyclopedia typically contain thousands of articles consists of textual content as well as images, sound and video (Wolfgang, Michael & Mathias, 2006). Example of digital encyclopedias is such as e-mobility, CD-ROM and open source encyclopedia. Yoon & Eenjun (2008), created an interactive aquatic plant encyclopedia that can handle various types of user requirements which are more accurate and enable faster image retrieval through e-mobile. Meanwhile, DVD-ROM or CD-ROM format of encyclopedia publications has the advantage of easily portable. Lastly, the open source encyclopedias such as Wikipedia which is comprehensively general encyclopedia comprising over 12 million articles in over a hundred languages and it is freely available on the Internet (Chittu et al. 2009). The digital encyclopedia allows the user referencing easier and annotated the pages. Furthermore, it offers greater search abilities than the printed version. The printed version allows searching for keywords through article text (Yoon & Eenjun, 2008). In addition, digital encyclopedia contents such as animations, audio and video are not able to insert in the printed format. Meanwhile, hyperlinking between related items is also a significant benefit of using a digital encyclopedia.

2.3Multimedia Technology

The multimedia technology is gaining popularity worldwide and brought a new dimension to the use of technology in education. The integration of audio, text, image, video and animation has extended the ways in which the learner can manipulate and interact with the content material through technology. The technology has spread in the educational system as a tool for effective teaching and learning (Adegoke, 2011). According to Norfarhana et al. (2010), multimedia technology offers a lot of advantages in the fields of education with the ability to combine multiple media elements in a package. The learning environment can be customized according to learners learning requirements. Furthermore, it has the greatest impact on education and allowing immediate enhancement and encouraging in the curriculum. Adegoke (2010), claims that multimedia technology increasingly providing a richer environment for learning. It also has been broadly accepted in teaching and learning in which it motivates the learner in the learning process. Vaugman (2008), studied that multimedia provoke radical changes in the teaching process during the coming decades. According to Fai, Allan & Lai (2006) study, multimedia application suitable uses in primary school where children like to interact with something that can give feedback to them. The use of multimedia application has been found to enhance student learning outcome (Adegoke, 2011). Multimedia application methods of teaching make the abstract knowledge into vivid contents and can stimulate student interest in learning to achieve intuitive nature of classroom teaching (Ying et al., 2011). According to Gordon (2010), a great number of traditional teaching and learning course materials are transformed in the multimedia environment. Generally multimedia learning aims at helping individuals to

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construct knowledge structures about a subject matter or to update their knowledge about a specific topic (Wolfgang & Holger, 2010).

2. 4Interactive Multimedia

According to Arrifin (2009), interactive multimedia are helping in creating knowledge by providing the surrounding fosters teaching and learning in which it supports, guides and widens the locus for thinking. Furthermore, interactivity in multimedia application assisting learning and allows the learner to explore the application by clicking and pointing the menus and buttons. Interactive multimedia learning emphasizes on interaction to stimulate student's interest in learning, mobilizing the enthusiasm and initiative of students and then improve teaching effectiveness (Zhen, 2011). In addition, interactive multimedia learning mode is more like constructing a spider's web with one linked to another, allowing choices in the learner's path (Savita, 2008). Interactive multimedia is the integration of two words which are interactive and multimedia. Defining these two words in depth could assist in understanding the word interactive multimedia. The term 'multimedia' referred as combination of audio, animation, text and graphic. The integration of text, audio, graphic animation and video are able to present information effectively and measurable benefits of gaining and holding attention of the user. Vaugman (2008), described multimedia as a combination of text, sound, animation and video delivered to user by a computer and richly presented sensation. Multimedia also can be classified as a collection of digital manipulated text, audio, graphic, animation into a computer based multimedia product. The combination of five multimedia elements such as text graphics, audio, animation and video creates a

multimedia learning material. According to Asthana (2007) study, the integration of multimedia elements into learning environments provides a powerful tool for education. The varieties of the multimedia elements for learning application are able to attract the students. The media elements reinforce the message and the delivery which lead to a better learning and able to create a high quality learning environment (Riazza & Halimah, 2008). Multimedia also has interactive characteristic that enabling the end users of the application to control the content and flow of information (Vaugman, 2008). Interactive is interaction between people involving computers as a means of exchanging and communication information. Multimedia learning process cultivates interaction between the user and the PC and the learner with the content (Belinda, 2006). Interactive enables the learners learn faster and have better attitudes towards learning when using interactive multimedia. Learners can manipulate virtual objects on the screen and simulations of experiments. Through interaction learners can dynamically and comprehensively control the learning resources, self-exploration to complete the study of the knowledge (Zhen, 2011). Interactivity is a fundamental part of a computer based application (Sylvie & Hilary, 2009). It allows children to stay attentive, focus and they have fun doing it without realizing they are learning. Interactive digital media have potential as a tool in learning for children because they can provide instant feedback, flexible and foster active learning.

2. 4. 1Component of Interactive Multimedia

In the age of information evolution, interactive multimedia play major roles in educational applications. The interactive multimedia has the potential to

attract the learner and able to create a more realistic learning environment through its component such as (Kia et al., 2007): Mixed Media (Sawsan et al., 2012)Multimedia are referred as the combination of element text, graphic, animation, hypermedia, video and audio. Multimedia provides attractive learning by backing various versions of the same piece of information in the varied formats. The use of multi sensing communication can lead to better learning results, increasing the motivation for the students to learn, achieving larger volumes of knowledge transfer and more attractive ways in presenting educational content. User Control (Sawsan et al., 2012)By interactive multimedia, allows a learner to take greater navigational control of the application by their preference and also able to repeat or review the sections as needed. It has given the ability to the learners to browse the application freedom and engaging learning activity. Interaction StyleInteractivity style could be classified at several mouse interaction styles which able to inspire children to learn effectively (Wolmet & Mathilde, 2011). Some of the interaction style that has been identified in the literature: Drag and Drop - An object is picked up by clicking down then dragged while the mouse is kept depressed and then dropped by releasing the mouse button. This is a complicated operation for children to understand and is difficult to perform while maintaining pressure on the mouse button during a drag operation (Wolmet & Mathilde, 2011). Point and Click – According to Sylvie & Hilary (2009), point and click is more effective interaction style. Children preferred the point and click interaction style explicitly stated that they found this style is easier as then they had problems guiding the mouse to the selection area, they could try again more easily with the application. Point and Select – According to Sylvie & Hilary (2009), children having difficulties

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moving the mouse down the list of selections and they tend to make mistakes while do the selection.

2. 4. 2Active learning through Interactive Multimedia

Active learning is typically learning by doing. Interactive multimedia application is rich of media which able to provide the pathway to reach students for active learning (Oliver et al., 2009). Feedback is an essential method of active learning when the user facing a problem in understanding the content of the application and this method is able to solve it. Moreover, interactive multimedia abilities to promote active learning by providing frequent interaction and feedback, and connection to real world contexts are made (Sawsan et al., 2012). Based on Wolfgang, Michael & Mathias (2006) studies, interactive multimedia abilities to promote active learning where it provides total coverage of navigation between articles by topics in alternative ways of browsing the hundreds of thousands interactive encyclopedia articles. Furthermore, children enjoy learning and understood by involving themselves directly with the application. For instance, Sawsan et al. (2009) found that children actively exploring the application by clicking the interface according to their preference. Children will able to gain knowledge and trigger new ideas via interactive multimedia learning (Alessandra, Elisa & Marco, 2010). Other research by Enrique, Hector & Mercedes (2010), claims that manipulating interface on the screen able to motivate the children to participate in better learning and understanding of the information. As the researchers have claimed, active learning through interactive multimedia application needs to clarify that the developed application are fulfilled the children's preferences such as navigational

control which enabling direct involvement with the application and frequent feedback to promote active learning.

2.5 Learning Style

Learning is fun. Every child possesses similarity and has different learning with each other. They are unique and learnt in their own learning style. The learning style has concept with a broad meaning. The learning styles are simple different ways of learning which attaining the children to be more effective and efficient in learning. Generally children learn through their senses by conveying information into their memory thinking using auditory, visual and kinesthetic. The human brain is pretty well adapted to process the information from everything that they see, hear and do (John, Rob & Jenny, 2008). The combination of the three types visual, auditory and kinesthetic is facilitating most of the children to learn well. Thus, to promote the efficient learning it is important to provide all styles in teaching. Children use a combination of styles but have a clear preference for one style. The learner may prefer one style of learning for one task, and a combination of others for a different task (Penger & Tekacvic, 2009). The students learn best with a preferred learning style. Learning styles are various approaches or ways of learning. It involves educating methods, particular to an individual, which allowing learning effectively. The children determine to learn effectively if taught in an appropriate method of learning style. Dunn Dunn's VAK model one of the various types of learning style which ia most commonly used (Akpltsyi & Mahdjoubi, 2011). VAK model is a learning style of visual, audio and kinesthetic learning which are looking into three wide range of learning style and it needs to be engaged as far as possible within the learning

process (Angeliki & George, 2008). The VAK model also known as VAKT which includes visual, auditory, kinesthetic and tactile. Visual learners, visualize information as a picture to aid memorization. A student with a visual learning style allows effective learning for a student with visual learning style by presenting the information in visual display such as images, videos, diagram, and illustrate ideas as a picture. Besides that, it is easy for the visual learner to look at charts and graphs while they might have troubled on focusing while listening to an explanation. Visual learners do well with class hands out the PowerPoint and movies. Visual imaginary and reading can also stimulate learning for student (Bushro & Halimah, 2006). Auditory learners will listens to the tone of pitch, voice, and other nuances and interpret the meaning of speech. They learn best through verbal lessons, discussion and storytelling demonstrate their point of view. Auditory learners would rather listen to information that being explained than read it. A common study method for auditory learners is by delivering the information loudly and having music in the background. The information which is delivered in auditory formats such as audio recording and lectures for a student with an auditory learning style is encouraging efficient learning. Incorporate sound files can improve the student's learning (Bushro & Halimah, 2006). Kinesthetic learners learn effectively while moving and touching. It divided into two channel which are kinesthetic movement and tactile. Kinesthetic learners process information best through hands on experience and actively exploring the physical world around them. By doing an activity is the easiest technique for kinesthetic learners to study which writing notes down while listening, makes the learner easier to understand and they will find difficulties if sitting still while studying.

Kinesthetic learners respond well to touching and creating thing in areas such as art and science. The kinesthetic learners will manipulate and carry out the issue, rather than viewing an image of it. A student with a kinesthetic learning style learns when information is conveyed in a hand on setting such as labs and workshop or participation classes. Hands-on activity of navigating window through software based program with a keyword, mouse or touch window enhances the kinesthetic intelligences (Bushro & Halimah, 2006). The VAK learning model emphasizes on the concept of visual, auditory and kinesthetic learning style to be included in the development of children educational application for effective learning.

2. 6Conclusion

The encyclopedia is a collection of knowledge from the past century till present. It is created in two different forms which are traditional encyclopedia book and digital encyclopedia. According to the literature review, learners prefer digital encyclopedia than traditional encyclopedias. Learners able to retrieves the information effectively and promote the interest of learning through electronic encyclopedia. Electronic encyclopedias are enabling to use in educational programs for trigger the learner for the breakthrough in multimedia application. Technology offers additional ways to learn and to demonstrate learning. In the age of technological development, children are at ease working on computers such as playing games, surfing internet and learning. Children may learn efficiently through technology rather than traditional learning methods which use the printed book. The digital technology learning environments are very interactive and the support of digital is immense. The learning process can

be enhanced through interactivity by creating integration with multimedia elements such as text, audio, animation and video. This makes children more likely to pay attention, and to learn the content of the program. The interactive multimedia component such as mixed media, user control and interaction style are able to attract and promote active learning among the children. Children who have unique learning style which computer are able to reveal hidden strengths. In order to develop children's application, it is necessary to try to enter the children's world of understanding (Marianna et al. 2011). Interactive media are useful in assisting learners with different learning styles to search new methods to explore and understand their learning. One of the suitable learning styles for children is the VAK model as suggested by (Akpltsyi & Mahdjoubi, 2011). Multimedia interactive encyclopedia will be developed according to VAK model that has special features for visual, auditory and kinesthetic.