ADOPTING MAYER'S DESIGN PRINCIPLES IN AN INTERACTIVE MULTIMEDIA WEB-BASED LEARNING MODULE TO PROMOTE STUDENT CENTERED LEARNING

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ABSTRACT

Many educators are aware that multimedia learning applications can bring positive impact to learners. At the same time, many researchers have claimed teachers and students can enjoy various benefits if multimedia learning application is used. However, we have to follow proper design guidelines while designing multimedia applications as not to bring cognitive overload to the students when using them. In this study, Mayer's design principles (Mayer, 2001) are adopted to design the interactive multimedia web-based learning module. On the other hand, we may also notice that teaching and learning environment has shifted to another paradigm where many universities are introducing student centered learning approach with the aim to achieve better learning outcomes. This paper would like to share the positive results obtained from the study where students had undergone an independent learning environment. Pretest and Posttest were given to the students to measure their performance before and after having the lesson using the learning module. After the lesson, students were asked to participate in the survey questionnaires in order to collect the students' perceptions towards the learning environment and feedback about the learning module. The results will be interpreted as per the design guidelines recommended by Mayer. This paper concludes with discussion on the positive impacts brought by this teaching and learning approach. With this study, it intends to share the positive outcomes received and encourages other educators to use this teaching and learning approach.

KEYWORDS

Multimedia, Interactivity, Web-based learning, Mayer's design principles, Student centered learning

INTRODUCTION

The teaching and learning process is believed to have come to a new phase where it should no longer be in the form of chalk-and-talk. Malaysia government introduced smart schools and encouraged the uses of ICT in teaching and learning because it is believed that it can ease teaching, gain attention from the students and also allow students to have better understanding (Abas & Chow, 2010). Every educator has his or her own way of teaching. No matter which teaching method is adopted, the main objective is to deliver the knowledge to students efficiently and effectively. Educators would want to see how students can demonstrate their skills or knowledge through the assessment of coursework and examination. At the end of each course, educators would be convinced from the students' results whether the respective teaching approach is successful. From the outcome, educators would explore more ways for students to learn better.

Information technology is advancing so fast until we have difficulty in catching up with the knowledge on new hardware and software. This change has also affected education institution where learning is no longer limited to the classrooms. Learning through the space of Internet is made possible nowadays. Besides that, it is common to see the usage of multimedia in PowerPoint slides, video clips, flash animation, and flash cards in teaching. New tools are introduced and new environments are engaged for teaching and learning. In Malaysia, many universities had started to use multimedia technology in teaching. Multimedia University has conducted a study where students are exposed to multimedia technology and it received positive results (Neo & Neo, 2001). Nevertheless, the new technology is not meant to replace the conventional teaching, but to serve as another option for teaching and learning.

BACKGROUND STUDY

Multimedia Learning

Multimedia learning is able to increase retention rate and to promote deeper learning. An integrated model was recommended by Hede (2002) which is to illustrate the relationships among various variables that explain the impact of multimedia in different learning situations. It was concluded that there are many factors involved in achieving the effects of multimedia on learning. Hede (2002) proposed an integrated model to illustrate the relationships drawn among various variables that determine the impact of multimedia in different learning situations. The variables identified are the following:

- Multimedia input (three elements: visual input, auditory input, learner control);
- Cognitive processing (two elements: attention, working memory);
- Learner dynamics (three elements: motivation, cognitive engagement, learner style); and
- Knowledge and learning (four elements: intelligence, reflection, long term storage, learning).

Therefore, the design of multimedia application needs to be carefully planned and woven to achieve positive effects towards the learning process.

There are many studies reported on the benefits of adopting multimedia learning in the classroom. Nicholson and Nicholson (2010) wrote a paper sharing the results of using one of the multimedia elements, which is video for teaching information technology. From their study, it showed positive and convincing results of having a multimedia environment for teaching and learning from both teachers and students. It was commented that this teaching method *"provides benefits to students in the form of greater satisfaction with the learning process, a greater understanding of the material."* (Nicholson & Nicholson, 2010)