Usability Matter: Teaching the Indigenous Students with Courseware?

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ABSTRACT

This paper reports results of a research carried out to determine the possibility of computer technology use among the indigenous children in teaching and learning. In this study, courseware was used in a classroom of a school for the indigenous children, in which their motivation was extremely low. Comparison between normal class and courseware-assisted class was carried out and reports in the methodology. Next, the results of the tests discussed. The findings reveal that the indigenous children were able to accept the newly-introduced courseware-assisted teaching and learning. This could be seen in their attendance record, and achievement improvement. This study concludes that the courseware could be a usable tool to support the indigenous learning motivation.

Keywords
Usability, courseware, indigenous students, motivation.

1.0 INTRODUCTION

Malaysia puts high importance rate for education at various levels. At the primary level, schools are equipped with computer technologies for teachers and students to utilize. Initiatives are encouraged to let students learn with computer technologies. In fact, schools are provided with courseware, which can be utilized in teaching and learning (Konting et al., 2003). Also, students are allowed to borrow the courseware (Ariffin & Norshuhada, 2008). Another, in current implementation, textbooks are provided with interactive CD, containing extra contents and exercises (MOE, 2009).

This is in line with the strategies of MyICMS 886 of the National Information Technology Council (NITC) (NITC, 2010). In addition, one of the major initiatives of MyICMS 886 in content development, in which one of the focus areas is for education. In education, many types of digital contents have been developed, and proposed for use such as audio and video (Cennamo, 1993), educational TV programme (Block, 2008), eBook (Norshuhada & Landoni, 2003; Sobihatun-Nur, Asmidah, & Ariffin, 2006), courseware (Faridah Hanim & Halimah, 2008), and RLM (Ariffin & Norshuhada, 2009). Among all these courseware is the most popularly used, and the one provided to schools.

1.1 Courseware

Coursewares are developed for access through the web, or for use on CD. For instance, Baloian, Berges, Buschmann, Gaßner, Hardings, Hoppe, & Luther (2002) use courseware in their computer-integrated classroom as the content repositories. Among the advantages of courseware, in which hypertexts are utilized, is the ability for learners to read in different orders. Every page contains links to a number of different pages which can be read next. Basically in courseware, the 'browse and click' is the main interaction approach. Regan and Sheppard (1996) classify the purposes of courseware as follows:

- to illustrate some design, development, and/or failure of devices/structures/systems; and to show relationships among design issues and devices.
- to contain exercises aimed at helping learners to better understand concepts through visual thinking.
- to serves as a guide, stepping learners through the various aspects (e.g. theory, physical setting) of performing physical experiments.
- as resources and references to complete assignment homework.

1.2 Interactive Multimedia

Other advantages of courseware can be seen in its interactivity. The philosophy of interactive

multimedia is to help in creating knowledge, besides, it should be able to act as a tool for cognitive, collaborative, and communicative by providing surrounding that fosters teaching and learning; in which it supports, guides, and widens the locus for thinking. With the ability to allow learners to click-and-browse; view animations, simulations, and real videos; inquiry-and-feedback; self-determined order of navigation, the interactive multimedia applications are reported by Norhayati (1999) as able to increase learners rate of understanding. The comparison or learning methods in terms of the level they affect understanding rates is tabulated in Table 1 (Norhayati, 1999).

Table 1: Relationship of learning methods and their rates of understanding

Learning methods	Rate of understanding (%)
Realizing real projects	100
Learning through interactive multimedia	**90**
Simulating the real situations	90
Making live performances	90
Delivering messages through speeches	70
Learning by involving in active discussions	70
Learning from live performances	50
Learning from exhibitions	50
Learning from films	50
Learning from pictures	30
Reading	20
Listening	10

From the data in Table 1, it is observable that activities involving interactivities such a making live performances, simulating real situations, interactive multimedia, and realizing real projects give sufficient effects to the rate of understanding (at least 90%). It can be concluded that interactivity is important to create environment that fosters learning and understanding. Interactive multimedia combines two words; multimedia and interactivity. Defining these two words could help understanding the word interactive multimedia which is part of the courseware.

Oblinger (1993) defines multimedia as a combination of two or more communication media such as texts, graphics, images, animations, video, and audio with special characteristics to come out with a presentation. This definition is agreed by many other definitions (Halimah, 1996; Agnew & Kellerman, 1996; Peck, 1998; Hillman, 1998; Elsom-Cook, 2001; and Scala Inc., 2004). In short, by referring to their definitions, multimedia is a combination of media elements that convey information and knowledge to learners efficiently.

Meanwhile, Oxford advanced learner's dictionary (2000) defines interactivity as allowing the transfer of knowledge in two directions continuously between human and computer. Carter and Burgess (2004), Hillman (1998), and Kruse (2004a) support this definition, which can then be concluded that, interactivity is a characteristic of a program that allows users to do something for supporting computer system's understanding and provision of feedbacks.

Interactivity could be designed at various levels. Norhayati (1999) classifies interactivity into three levels; low, intermediate, and high. Similarly, Rhodes and Azbell (1985) also classify the interactivity into three levels; reactive, coactive, and proactive, but they term the levels differently. Table 2 includes the levels by Norhayati and Rhodes and Azbell.

Table 2: Levels of interactivity

	Level of interactivity	Description
Norhayati	Low (navigation)	Focuses on navigating through the application. User needs to do minimum tasks to retrieve the intended information.
	Intermediate (functionality)	There are certain goals to achieve, and users are required to control the application.
	High (adaptive)	Users are allowed to control the application creatively. They could tailor the application to meet their preferences.
Rhodes and Azbell	Reactive	Users have little control over the application, and the feedbacks from application are direct.
	Coactive	Users can determine sequences, style, and steps to perform.
	Proactive	Allows users to control application's content and structure.

In addition, interactivity has its own characteristics. As a consequence, Borsook and Higginbotham-Wheat (1991) identify the common characteristics of interactivity. The characteristics are listed below:

- *Instant and quick feedback* – feedback could be retrieved with a single mouse-click, or a press on a button. Users are also expecting for ways to overcome error if it happens.
- *Non-sequence information retrieval* – users could access information as they desire.
- *Adaptable preferences* – applications need to be customizable to support user's preferences.
- *Options* – users feel honored to choose from provided options; so application needs to provide options.
- *User control* – users need to control the application, such as navigation, so avoiding application making control over the users is important.
- *Appropriate grain-size* – the duration required for application to be disturbed. Users do not like to wait for many minutes, so the grain-size needs to be short.

1.3 Indigenous Children

In current literatures, studies relating the indigenous children are still not in favor. However, Halimah, Norhayati, Tengku Mohd., and Azlina (2005) have discussed about this issue, and proposed a model for the next generation of eLearning at schools. In fact, there are studies in rural areas such as eBario (ebario, 2010) and Dhawan (2004) show that technology can be accepted by the indigenous

people, not only in learning activities but also in performing daily transaction.

In Malaysia, the indigenous children comprise at least nineteen culturally and linguistically distinct groups. The largest are the Semai, Temiar, Jakun (Orang Hulu), and Temuan. Children of the indigenous children attend pre-schools and primary schools in their settlement in jungle areas and are thereby physically excluded from the mainstream. The indigenous children are drawn into the mainstream to receive secondary and higher education. (Endicott and Dentan, 2004).

Thousands of indigenous children stopped schooling after the primary level. According to the Department of Indigenous People Affair (Jabatan Hal Ehwal Orang Asli – JHEOA), the dropout rate in the 1980s was extremely high, especially for the low achievers (Jimin et al. 1983). On average 25% of the children who started primary school, mostly in JHEOA schools, dropped out after only one year, and about 70% of all students dropped out by the end of grade five (Mohd Tap, 1990). According to de Paul, about two third of the indigenous children in 1994 (47,141 out of 70,845) between the ages of five and eighteen did not go to school at all (1995). Another study found that the dropout rate among indigenous children was still extremely high at the end of 1990s (Hanizah Hashim, 1999). In fact, in 2003 there were 23,607 indigenous children entered primary schools but only 6,675 went to secondary schools. While in 2004, it was recorded that from 25,354 indigenous children entered primary schools only 7,559 went to secondary level (JHEOA, 2010).

Overall, the number of indigenous children in standard one was always high. Educators need to capture their interest in many ways to make them feel happy to be in school and learn. This factor is important to motivate them intrinsically, so that they continue their study on their own will. One of the possible efforts to motivate the indigenous children is the use of courseware in teaching and learning. Many studies have shown that multimedia applications can benefit learners in many senses, as discussed in the next section.

1.4 Advantages of Multimedia Applications

Multimedia applications were found motivating (Mandinach & Cline, 1994; Beichner, 1994; Kafai, Ching, & Marshall ,1997), engaging attention (Hancock & Betts, 2002), and entertaining students (Jonassen & Reeves, 1996). This means that when working with multimedia materials students are concentrating on learning assignments and contents, and their task-orientation is preserved. The other side of the coin is superficial engagement and surface-level processing if students are just focusing on the 'entertaining' features of multimedia (e.g. sounds and visual effects). Also, multimedia applications can be used effectively in addressing instruction (Carroll, 2000). In fact multimedia applications are tools that support multiple intelligences (Lazear, 2000) that can enhance diversification (Houghton, 2000) which can lead to improved achievement (Cradler, McNabb, Freeman, & Burchett, 2002).

Based on the above discussions, this study attempts to find out whether the indigenous children can accept the multimedia application, specifically courseware. The objectives include: (1) to determine whether the indigenous children are attracted to the courseware, (2) to compare their reactions between traditional teaching style and teaching-with-courseware. To achieve that, the methods as discussed in the following section were followed.

2.0 METHODOLOGY

This study was scoped to a school for the indigenous children in Selangor named Sekolah Kebangsaan Bukit Cheding (Asli) (see Figure 1). Students were identified based on the skills in 3R (i.e. Reading, Writing, and Arithmetic). In a scenario, the indigenous children follow a special program called Special Treatment Class. In this programme, they were given more attention and closer guidance in terms of discipline, skills, creativity and flexibility. They studied on basic 3R such as recognizing alphabets, basic reading, writing, and arithmetic. In the program, only a special teacher is dedicated for these students. Traditional learning tools were used for all activities. Students who show any improvement will be promoted for higher level class. However, it was found that, most of the students remain in the same class for a couple of years. There are 20 of 140 students of Year 1 to Year 5 who followed the programme. From the group, about 10 students from Year 1 until Year 3 have been recognized and selected to involve in this study. They were selected based on the following criteria:

i. Low motivation - they were not interested in education and very seldom completed their school works.
ii. Low IQ skills - they always score lowest test marks.
iii. Lack of discipline - they absent from school very frequently.

Two coursewares were utilized in this study, Bahasa Melayu and Mathematics. The teacher used a notebook to run the courseware which was projected to the wall using an LCD projector. In addition, the learning activities were focused on: (i) recognizing, saying, and writing the basic alphabets (A-Z), (ii) reading and writing short words, (iii) Recognizing, saying, and writing the basics numbers to 100, and (iv) counting a group of objects to 100. Having selected the subject of study, the indigenous children were introduced

with courseware. Their teaching and learning scheduled was also accommodated with different modes, two days a week utilizing normal style, while three days utilizing courseware. A three-month period was spent to let the indigenous children experience the two teaching styles. Tests were given to them to measure scores between different teaching styles. The following section discusses about the results of the tests and observations.

Figure 1: Indigenous children in their classroom

3.0 FINDINGS

3.1 Courseware Motivates Student

This study compared the indigenous children's attendance to classes with normal style and courseware assisted. Data on the attendance are visualized in Figure 2.

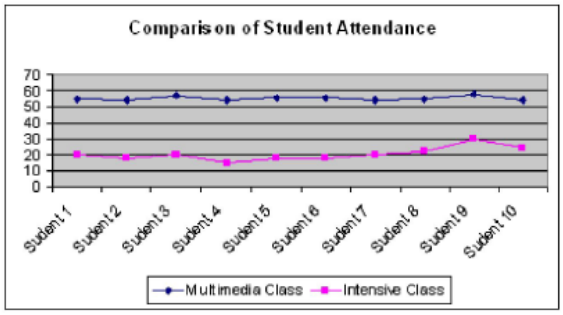

Figure 2: Comparison of student attendance

From Figure 2, it is seen that the indigenous children turned up for courseware-assisted class more than the normal class. This gives an understanding that the students enjoy learning in the environment, with supports of computer technologies. During the observation, they were clearly seen enjoyed more studying in the courseware-assisted class.

3.2 Multimedia Can Enhance Student Engagement

In addition to the attendance, this study also compared their attitudes in different environments. From the observations with the assistance of the teachers, the students were found easily got bored and most of them never complete their works on time. Their attitudes were different in the courseware-assisted class where most of them tend to complete their works as early as they can. This situation needs urgent answers. One possible reason may be because the nature of courseware that is attractive and 'entertaining' with its color, audio, and visual elements.

3.3 Courseware And Achievement Improvement

This study conducted separate tests, which has the similar contents and activities as in the courseware. The results revealed that there is only a slight different on the achievement for both Bahasa Melayu (Figure 3) and Mathematics (Figure 4). The results for both tests were almost at par and at average level. This shows that use of courseware somehow improves the indigenous children's achievement. However, the improvements were not significant. This is another finding that needs urgent further research. In this study, the indigenous children were found attracted to the courseware-assisted teaching and learning only, to motivate them attending classes, but not to improve their achievement.

Besides, based on the verbal and writing test, there is significant improvement on their 3R skills. This study considered this achievement as a contribution to the school to reduce the number of illiterate student. Thus, courseware-assisted learning was found as an alternative approach in educating indigenous student in the future.

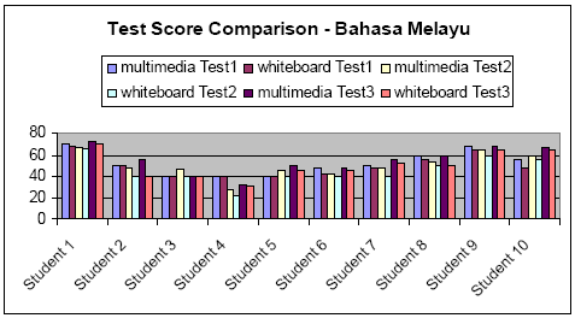

Figure 3: Comparison of Test Score – Bahasa Melayu

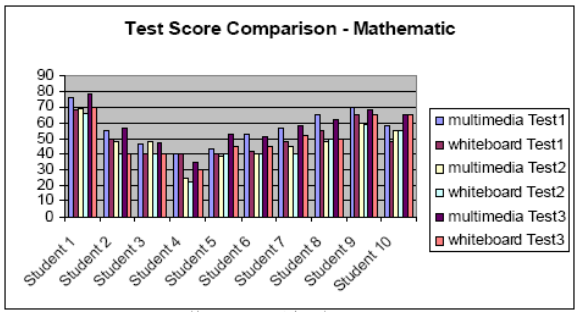

Figure 4: Comparison of Test Score – Mathematic

4.0 CONCLUSION

From this study, it was found that the indigenous children can accept the nature of courseware-assisted learning. Also, their achievements were found better when using courseware compared to normal way. These findings need further empirical works in future to collect more data for comparison. Qualitative data from observations can be based to state that the indigenous children can adapt themselves with technologies in teaching and learning. This can be related to the arguments by Lazear (2000) who argues that courseware can support multiple intelligences, and that the courseware can enhance diversification (Houghton, 2000) which can lead to improved achievement (Cradler, McNabb, Freeman, & Burchett, 2002).

From the findings, based on the roles and advantages of interactive multimedia, this study argues that courseware and other interactive multimedia can be usable to motivate the indigenous children in teaching and learning. Based on the model by Norhayati (1999), researchers may start proposing the technologies with those require low or intermediate level of interactivity first.

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