

The Effectiveness of using Multiple Intelligences Courseware in Learning Multimedia Subject

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ABSTRACT

Background: The theory of Multiple Intelligences (MI) was used in this paper. This courseware provides multiple learning approaches that can achieve community colleges mission to provide a systematic and integrated education and training. There are at least seven types of intelligences that human possess.

Objective: The objective of this paper is to evaluate the effectiveness of learning using MI Courseware. **Methodology:** The methodology used is based on the ADDIE teaching model that consists of five phases. An evaluation of MI Courseware has been completed by 42 students from Kolej Komuniti Masjid Tanah.

Results: The findings revealed those items related to the MI courseware contents produced good responses. The results showed that the MI Courseware can help and enhanced student's skills in Community College. **Conclusion:** Overall, the perception of respondents towards the MI Courseware was encouraging.

INTRODUCTION

According to Gardner (1983), different human has different ways of thinking and learning which is student in Community College has different potential and different multiple intelligences. This courseware provides multiple learning approaches that can achieve Community Colleges mission to provide a systematic and integrated education and training. In Malaysia, this learning tool can be implemented as part of Community College teaching and learning model and the need to fulfill the Community College objectives. There are seven types of intelligences that humans possess. They are verbal-linguistic, logical-mathematics, visual-spatial, musical, bodily-kinesthetic, intrapersonal and interpersonal skills. The main objective of this paper is to evaluate the effectiveness of using MI courseware in learning multimedia subject.

Multimedia is an exciting combination of computer hardware and software that allows you to integrate text, video, animation, audio and graphics to develop effective presentations on an affordable desktop computer (Fenrich, 1997). Multimedia is characterized by the presence of text, pictures, sound, animation and video; some or all of which are organized into some coherent program (Phillips,1997). Crosby and Stelovsky, (1999) evaluates the effectiveness of multimedia instruction by comparing students' performance in two computer science classes. Experiment class was taught using multimedia instruction and the other was taught using traditional instruction. The findings suggested that multimedia courseware enhances computer science instruction and improves students' performance. Research studies in recent years have consistently reported on the increased amount of cooperation and social interaction around computers as compared to other more traditional classroom environments and activities (Wiburg & Carter, 1994).

Multimedia offers another medium that addresses these intelligences. For example, the hands-on activity of navigating through software-based programs with a mouse, keyboard or touch window enhances the kinesthetic intelligences. Creating or manipulating images and videos help those with visual-spatial strengths. Visual images in CD-ROM programs may stimulate the mental representations that students can use in the study of other topics (Veneema 1995). Linguistically strong students can read online articles. Reading and phonics programs can also stimulate learning for these students.

With multimedia, the process of learning can become more goal oriented, participatory, flexible in time and space, unaffected by distances and tailored to individual learning styles, as well as increase collaboration between teachers and students. Multimedia enables learning to become fun and friendly, without feeling the fear of inadequacies or failure. Many researchers have carried out the study on the effectiveness of using multimedia and how knowledge can be shared. The multimedia technology enhances learning by its ability to combine pictures, diagrams, sound, texts, image, and graphics with appropriate animation and simulation that can stimulate learners mind and encourage learning through all senses and motivation. The quality and range of materials have proven to be the strongest feature of the courseware. Educators often use the courseware to support teaching, while students may use it in computer lab sessions or independently to prepare for classroom discussion and tutorial. However, some studies show a negative result.

RELATED WORKS

Howard Gardner (1993) is a psychologist and professor at Harvard University's Graduate School of Education. Based on his study, Gardner developed the theory of MI which means that each student has two or three dominant intelligences that he or she uses to solve problems and respond in tense situations. Moreover, most of all people have the ability to develop skills in each of the intelligences and to learn through them. As mentioned in Salam et. al (2014), each students have his or her own unique set of intellectual strengths and weaknesses. With the MI theory applied in the classroom, students will easily understand their lesson.

The courseware development since the early 2000s has been growing rapidly in Malaysia. Many educators develop the innovation of teaching and learning in their institution. After a few years, a number of courseware based on the MI theory has been developed (Ali, 2008; Aziz et. al, 2011; Salwani et al., 2008). There are various ways to implement the MI theory and the implementation may look different in every classrooms (Baum, Vines, & Slatin, 2005).

Ali (2008) develops a MI courseware for learning Trigonometry in Mathematics subject for the smart school in Malaysia. By merging the MI theory, teaching and learning theories as well as instructional design models can successfully produce a multimedia software to meet an individual diversity. The result showed that there was an increase on the achievement of teaching and learning that match their intelligences. In the same year, Salwani et al. (2008) also develop a MI courseware for Chemistry subject for the smart school in Malaysia. The courseware provides comprehensive and interactive notes, exercises, tutorials, and quizzes that equipped with animated graphics and games which can stimulate and entertain students as well as improve the information transformation from short term memory into long-term memory.

On other related study, Aziz et al. (2011) developed an Assistive Courseware (AC) for visually impaired learners based on theory of MI and also adapted the knowledge of the spiral model. It explains how the AC delivers knowledge to Visually-Impaired (VI) learners. The results showed that the AC is fully equipped with the eight type of MI theory and the use of the SECI model in transferring the knowledge between the AC and VI learners have been proven

MATERIAL AND METHODS

In development phase, the storyboards, content and graphics are prepared. The actual creation (production) of the content and learning materials based on the design phase. The courseware will be developed on Macromedia Director MX and Flash MX functionality and accuracy test will be done to ensure its error proof. During the implementation phase, students are allowable to use the courseware. Materials are delivered or distributed to the experiment group. After 15 hours of session and completing the multimedia courseware, students from both groups were given a post test. For the Group B (Control Group), the session of teaching and learning used are slide presentation and hands on activities and Group C (Conventional) used conventional courseware. But for the Group A (Experiment Group), the students in this group used the MI Courseware for the sub topic Adobe Photoshop CS3 based on MI. The courseware was installed in the computer laboratory.

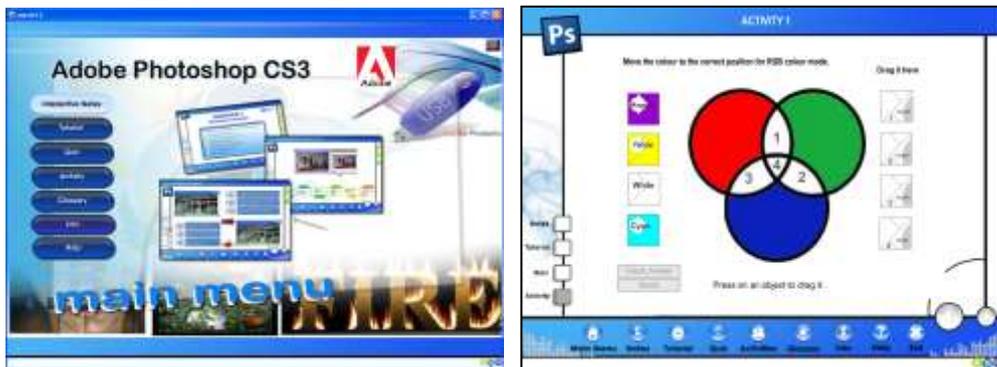
In the analysis phase, students were given a pre-test to identify their current knowledge. A pre-test with 10 items multiple choice question, 5 items true/false question and 5 items fill in the blanks question was given to students from Group A, B, C and they were require to finish in one hour. It was done at library. MI Test is used to determine which intelligences are the strongest for a student. This form was taken from Chapman (2007) through his website. Different people work and learn best in various ways. This means that in our classrooms we will inevitably have a variety of preferred learning styles. This, of

course is not new to anyone, but there is now a growing need to help student and lecturer find out more explicitly how student learn best and what this means for their work practices.

A case study was done to evaluate the effectiveness of the developed courseware through a quasi-experiment. For the quasi-experiment design, the control group received conventional teaching method. On the other hand, treatment for experimental group consisted of working with the MI Courseware on the topic of Adobe Photoshop CS3. Duration of treatment consisted of three hours for five sessions. The control group and conventional group underwent the same duration but taught in the conventional way. Lessons for treatment group were carried out in the multimedia lab. Before the experiment, the students in the treatment group were trained using the MI courseware.

Multiple Intelligence Courseware (MICourseware)

MICourseware was developed based on the theory of MI in education by Howard Gardner (Figure 1). This courseware provides interactive notes, tutorials, quizzes and activities that equipped with graphics and videos which can excite and entertain students and improve the information transfer from short term memory into long-term memory. The novelty of the courseware is that the system can easily be explored by student. The courseware allows students to navigate through system to a specific part of their interest. Lecturer on the other hand, can select which modules in interactive notes, tutorials, quizzes or activities independently and can choose whether to use part of the courseware or to use it comprehensively. Table 1 shows the comparison between traditional teaching and learning, conventional courseware and MI courseware.



(a) (b)
Figure 1: (a) Main Menu, (b) Learning Activity (Visual-Spatial)

Traditional education focuses on teaching, not learning. Most of the lecturers in Community College are using this method. They still use chalk and talk method, give handouts to student and write on the whiteboard. Mostly the handouts are given to the student before start lecture. Figure 2 shows the elements in traditional teaching and learning in classroom.

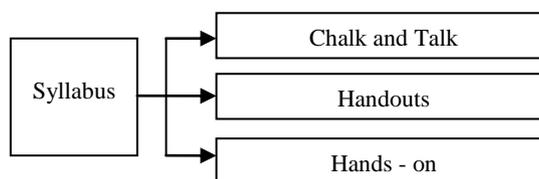


Figure 2: Traditional teaching and learning

Figure 3 shows the conventional courseware elements. Conventional courseware is the use of different communication mediums within a single computer program used to present information. By communication mediums, audio for music, sound effects, or voice-over narration, still photographs and graphics to help the end user understand the message that is being presented, video to further explain or illustrate ideas. Learners can create more cognitive paths allowing quicker retrieval of information.

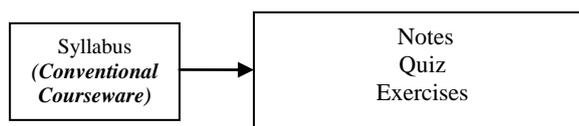


Figure 3: Conventional Courseware

Figure 4 shows the elements in MI Courseware developed for Community Colleges which provides interactive notes, tutorials, quizzes and activities based on multiple intelligences.

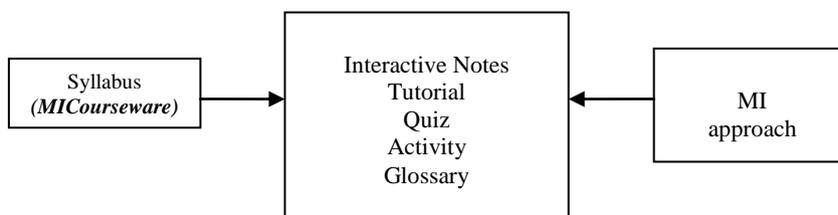


Figure 4: MICourseware

Table 1: Comparison between Traditional Teaching and Learning, Conventional Courseware and MI Courseware.

| Traditional Teaching and Learning | Conventional Courseware | MI Courseware |
|--|---|--|
| A teacher centered environment | A student centered environment | A student centered environment |
| The teacher is in control. | Students are in control of their own learning. | Students are in control of different styles of learning. |
| Power and responsibility is primarily teacher centered. | Power and responsibility is primarily student centered. | Power and responsibility is primarily student centered. |
| The teacher is the instructor and decision maker. | The teacher is a facilitator and guide. The students are the decision makers. | The teacher is a facilitator and guide. The students are the decision makers. |
| The learning experience is often competitive in nature. The competition is usually between students. Students resent others using their ideas. | Learning may be independent. | Learning may be co-operative, collaborative or independent. Students work together to reach a common goal and help each other's. |
| Learning takes place in the classroom. | Learning extends beyond the classroom. | Learning extends beyond the classroom. |
| The content is most important. | The way information is processed and used is most important. | The way information is processed and used is most important. |
| Students master knowledge through drill and practice. | Students evaluate, make decisions and are responsible for their own learning. Students master knowledge by constructing it. | Students evaluate, make decisions and are responsible for their own learning. Students master knowledge by constructing it. |
| All students in a classroom are taught the same material. | All students in a classroom are taught the same material. | All students in a classroom are taught the same material with MI approaches. |
| Students learn through listening and observation | Students learn through Hands-on activities, Group activities | Students learn through 8 types of intelligences proposed by Gardner. |
| Instruction based on textbooks, lectures, and individual written assignments | Instruction based on courseware | Instruction based on interactive notes, tutorial, assignments, quiz and activity. |

RESULTS

In this section, the results of the study are presented and discussed. A quasi-experimental was carried out with 42 certificate students age between 18 to 22 years old from Kolej Komuniti Masjid Tanah. The respondents consisted of Final Semester Student from IT department (Table 2). The groups are divided into three which are: (a) Group A (Experiment): This group used the MI courseware, (b) Group B (Control): This group received conventional teaching method and (c) Group C (Conventional): This group used conventional courseware.

Table 2: Sample of students

| GROUP | TOTAL |
|------------------|-------|
| A (Experiment) | 14 |
| B (Control) | 14 |
| C (Conventional) | 14 |
| TOTAL | 42 |

Performance Means

The results of the scores of the pre and posttests of the three groups are given in Table 3 and 4. The analysis was carried out at level of significance $\alpha = 0.05$. Out of 20 items, the pretest mean score for Group A, B and C are 6.64, 5.29 and 5.29. The result of the posttest indicated that performance for all group was increased after the instruction. From this table, it is an evidence that the experiment group performed better on the post test and had higher learning gain than the other group.

Table 3: Performance Means

| GROUP | N | PRE TEST | POST TEST | LEARNING GAIN |
|-------|----|----------|-----------|---------------|
| A | 14 | 6.64 | 18.29 | 11.65 |
| B | 14 | 5.29 | 12.21 | 6.82 |
| C | 14 | 5.29 | 14.07 | 8.79 |

Table 4: Pre-test and Post-test results

| TEST | GROUP | N | Mean | Std. Deviation | Std. Error Mean |
|-----------|-------|----|-------|----------------|-----------------|
| PRE-TEST | A | 14 | 6.64 | 1.393 | .372 |
| | B | 14 | 5.29 | .994 | .266 |
| | C | 14 | 5.29 | .994 | .266 |
| POST-TEST | A | 14 | 18.29 | .994 | .266 |
| | B | 14 | 12.21 | 1.122 | .305 |
| | C | 14 | 14.07 | 1.141 | .305 |

Results

Since the probability value obtained from SPSS 19.0 for windows (0.000) is less than the predetermined alpha value (0.05), thus there is a significant difference in the distribution of pretest and post-test scores for students in experimental group. This conclusion is made at the significance level, $\alpha = .05$ (5%) or confidence level (95%).

To conclude, there is a significant difference in students' achievement before and after in the experiment group. It shows that participants' score on posttest were better than pretest score. The data shows that applying MI theory in courseware was effective in improving student's achievement. The t-test for learning gain showed that there is significant difference between the group A, B and C (Table 5).

Table 5: T-test for learning gain

| GROUP | N | MEAN | t-TEST | SIG |
|-------|----|-------|--------|------|
| A | 14 | 11.65 | | |
| B | 14 | 6.82 | 2.873 | 0.02 |
| C | 14 | 8.79 | | |

CONCLUSION

From the results of this study, it can be concluded that the MI Courseware is suitable as a supporting learning aid for Community College's students learning Adobe Photoshop CS3. Students perceive this MI courseware as user friendly and capable of enhancing the learning of the subject. The MI Courseware was successfully produced with all the features intended and the evaluation of the MI Courseware was carried out successfully. However, an educator must act as facilitator in the classroom. Improvements still had to be made to the courseware to make it better. For future research, the courseware will be upgraded with more activities based on MI and the courseware will be uploaded to LMS (Learning Management System) as an e-learning or mobile learning. Overall, the result of the study showed that the study was successful in achieving its objectives.

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