Implementation of Digital Game-Based Learning Approach in CTU281 Subject: The Impact on Self-Motivation among Graphic Students in UiTM Melaka

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ABSTRACT

Interactive multimedia technology and digital game approach in learning environment can foster a more effective and interesting learning process, especially among university students. This study was made with the implementation of digital game-based learning approach for the final project of Diploma in Graphic and Digital Media (AD111) students from UiTM Alor Gajah, Melaka who took the Islamic Beauty and Creativity subject (CTU281) to see the impact and effectiveness of digital game-based learning on students' academic performance and self-motivation. The study sample was taken starting from the process of students completing their final project until the Islamic Art and Communication Festival (ISAC 2016) program takes place.The ISAC 2016 program is a platform organized by the Academy of Contemporary Islamic Studies (ACIS) in collaboration with the Faculty of Communication and Media Studies (FKPM) and the Faculty of Art and Design (FSSR) which aims to reduce students' failure statistics in CTU course code as well as helping students to pass in this compulsory subject. This program involves all Semester 3 students of Faculty of Art and Design, UiTM Cawangan Melaka who took the CTU281 subject and also the students from Faculty of Communication and Media Studies who took the CTU271 subject. However, this study only involved 14 groups of Diploma in Graphic and Digital Media (AD111) students, UiTM Cawangan Melaka who took the CTU281 subject. The results of the study found that the students were very motivated with the results of their projects whereby two projects from the AD111 group were named as the Best Projects. In conclusion, the failure statistics for CTU281 subject code among graphics students last semester can realistically be reduced with the implementation of digital game-based learning approach as this approach helped students pass in this subject as well as increase the students' potential to be more positive and upgrading their self-motivation.

INTRODUCTION

Due to the information technology boom and in line with the national Vision of 2020, education in Malaysia has grown rapidly. The development of information technology has become one of the catalysts of the paradigm shift towards the cultivation of Science and Technology to create human and community resources capable in the field of technology in line with the mission and vision of the country (Norjihan et. al., 2005). Thus, digital games or creative multimedia technology is becoming a learning trend applied by educators to support the teaching and learning process because students can enjoy a more productive and relaxed learning environment with an enjoyable learning approach. Digital games are also indirectly seen as able to provide motivation and positive impact in students' learning behavior and self-confidence.

According to Abdul (2017), the failure statistics for Islamic Beauty and Creativity (CTU281) subject among Diploma in Graphic and Digital Media (AD111) students had increase in 2015. There are several key factors that contribute to the percentage of students' failure such as absenteeism to class session, failure to complete assignments and the failure to sit for final exams which are the compulsory requirements to be fulfilled. This may be due to less conducive learning environment factors, as well as teaching aids that can only provide a passive two-way communication space between lecturers and students. Thus, it will cause students to be less motivated and the learning process will be less effective.

Therefore, the objective of this study is to determine the impact on performance and motivation of graphic students in CTU281 subject with the implementation of digital game-based learning approach in their final project. Communication Festival (ISAC 2016) is a platform organized by the Academy of Contemporary Islamic Studies (ACIS) in collaboration with the Faculty of Communication and Media Studies and a joint venture from Faculty of Art and Design for the first time, aimed in reducing students' failure statistics in CTU course code in order to pass in those compulsory subjects. This program involves all Semester 3 students from Faculty of Art and Design who took the CTU281 subject and from Faculty of Communication and Media Studies who took CTU271 subject. This program is held to cultivate the knowledge, research and creativity of students in shaping Islamic art and communication among students as well as increase students' self-motivation.

Specifically, in the study conducted, the game design development process has been recorded starting from the preliminary sketches process which involves the discussion of ideas and creativity from students in groups. The sketch of ideations should comply with criteria from the contents of the Project Brief distributed by CTU281 lecturers. In addition, the work process of these students will always be monitored and supervised by FSSR lecturers who teach the Interactive Design (GDT213) subject to ensure each process that each group goes through according to the specifications that have been set.

Next, students also need to go through a pre-production, production and post-production phases to develop and undergo a pilot test on their digital game prototype. Students are required to develop a game prototype using Construct 2.0 software. The idea to adapt Islamic content into digital game approach is actually applicable to meet the needs of the mainstream which can increase the motivation of students and at the same time still maintain the Islamic aesthetic value and content for this course syllabus. Furthermore, this digital approach will help improve students' academic performance and cognitive skills as well as remain the good social relationships among peers through the spirit of group collaboration.

LITERATURE REVIEW

Learning Based on Digital Games and Interactive Multimedia

Lecturers are the main pillars who play an important role in ensuring that teaching and learning process can be more effective and enjoyable (Jones & Jones, 2004). Therefore, lecturers also need to ensure that the effective learning process will able to increase students' interest and encourage them to succeed in the courses learned. Education should be a pleasure to students not something that is burdensome and boring (Damodharan and Rengarajan, 2007). In fact, today's generation is more inclined towards media-centric because they are more exposed to modern and latest technologies such as the internet, social media platforms, WhatsApp application and mobile gaming compared to previous generations. In fact, many opinions suggest that today's generation is capable of spending most of their time in front of a computer screen to watch videos, listen to music, and play computer games because they basically communicate digitally every day. So, it is not surprising that many have named this new generation as the digital generation (Shelly, Cashman, Gunter & Gunter, 2006). Conventional learning sessions in the lecture room allow the lecturer to control the teaching process, the delivery of information is comprehensive and the lecturer tends to emphasize knowledge factually. In other words, the lecturer delivers the content of the lecture and the students only listen to the talk delivered. Therefore, learning modes tend to be passive as well as hands on and practical activities are also minimal in their learning process.

In fact, most universities face a similar situation whereby the conventional teaching and learning (T&L) approach applied in the lecture room is within limited effectiveness. In such situations, students only play a passive role and their focus on the lecture session will disappear after 15 to 20 minutes (Damodharan & Rengarajan, 2007). On the other hand, digital game approaches and interactive multimedia technology in the learning environment can foster a more effective and interesting learning process especially among students. The rapid development of ICT has led to the widespread use of technology in teaching and learning because it can increase student morale as well as create a 'living' and effective learning environment. In fact, technology helps students and lecturers to produce more productive work (Keengwe, Onchwari et al. 2008). Nowadays, digital games and online learning approach have become the focus of every educational institution in Malaysia as a medium for teaching and learning. The implementation of MOOC as one of the university's initiatives in preserving the interactive learning curriculum also helps in achieving the objectives of this study.

Digital games are a form of entertainment and it becomes an effective medium to motivate students to engage in learning activities as a whole (Prensky, 2003). In fact, academic researches related to game-based learning (GBL) are very widespread nowadays. The studies show that digital games and multimedia technology have great potential to motivate students to engage in an interactive and more casual learning environment. According to a study by Jamalludin and Zaidatun (2005), education is one of the areas whereby multimedia can have a huge impact. According to them, the learning approach that applies multimedia is able to change the textbook information which is originally static and visually in 2 dimensional into a new learning style that is more interesting and interactive. This statement is also supported by Mayer (2005) who also stated that multimedia is a very potential technology whereby it is able to improve the human learning process if the multimedia is developed based on the right principles. In the study of Hasimah and Rafie (1994), the interactive multimedia application developed was used and tested by a group of students through a distributed questionnaire. The results of their study found that 90 percent of students agreed that the use of interactive multimedia application can enhance their motivation and interest to continue the learning process. In addition, as explained by Floyd (1991), multimedia allows students to learn a concept according to their learning style either through reading the material, through visualization, through listening or through engaging in the material.

RESEARCH METHODOLOGY

The development process of application involves several systematic procedures that begin with the process of analysis, design, development, implementation and evaluation of teaching (Baharudin et al., C (2002)). Figure 3.0 shows the overall methodology of this project which is using the ADDIE model. ADDIE model design is an instructional model that serves as a guide to the construction of software and learning materials based on needs (Wang & Hsu, 2009). The design of application development based on the ADDIE is explained as Analysis, Design, Development, Implementation and Evaluation. Apart from that, this study also involves observation (site observation) on the students' work process from the initial stage starting with a sketch of ideation until the stage of evaluation or final test (pilot test) on digital game prototypes. On the other hand, data collection was done as one of the additional instruments to support this study by obtaining online feedback samples from 42 respondents consisting of students majoring in AD111 regarding the effectiveness of implementing interactive learning methods in CTU subjects.
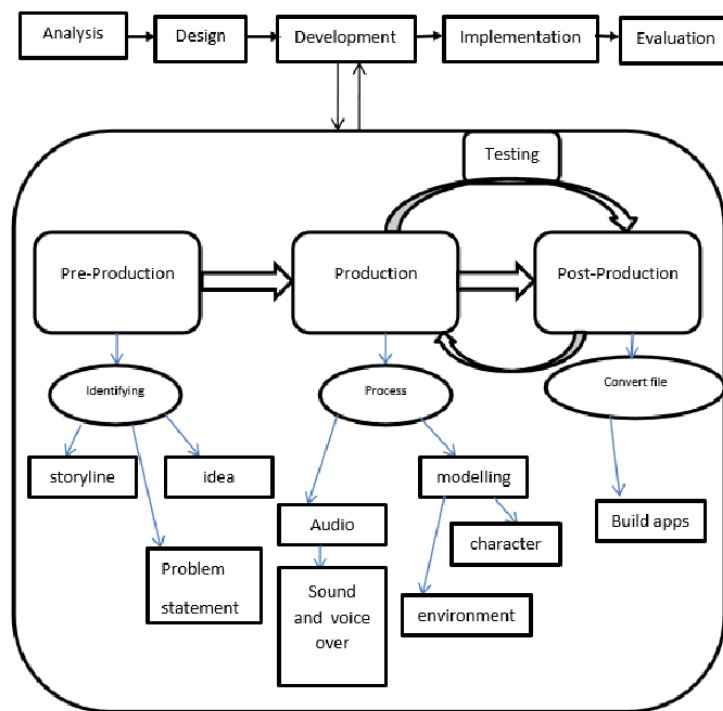

Figure 1 ADDIE Model

FINDING

Based on the findings of the study, this digital game development process was successfully implemented through several phases based on the ADDIE model:

Pre-Production Phase

In the pre-production phase, design development begins with mind mapping and initial sketches based on discussions among group members and monitored by supervising lecturers. This method is done to identify the most appropriate content in the game design and game play according to the criteria provided in CTU281 Project Brief to be implemented in digital form. In addition, students are required to follow the theme set by the CTU281 lecturer with the theme ―Malay Archipelago.

Furthermore, content is one of the most important aspects in developing ideas including the main characters, supporting characters, environmental and props design as well as gameplay that comply with Islamic law and aligned with the theme that has been set. In addition, paper prototype is one of the instruments that help a lot to organize and understand in depth the flow of the game. Paper prototype helps to improve user interaction as well as to analyze the development process of interface design and the flow process of interactive multimedia
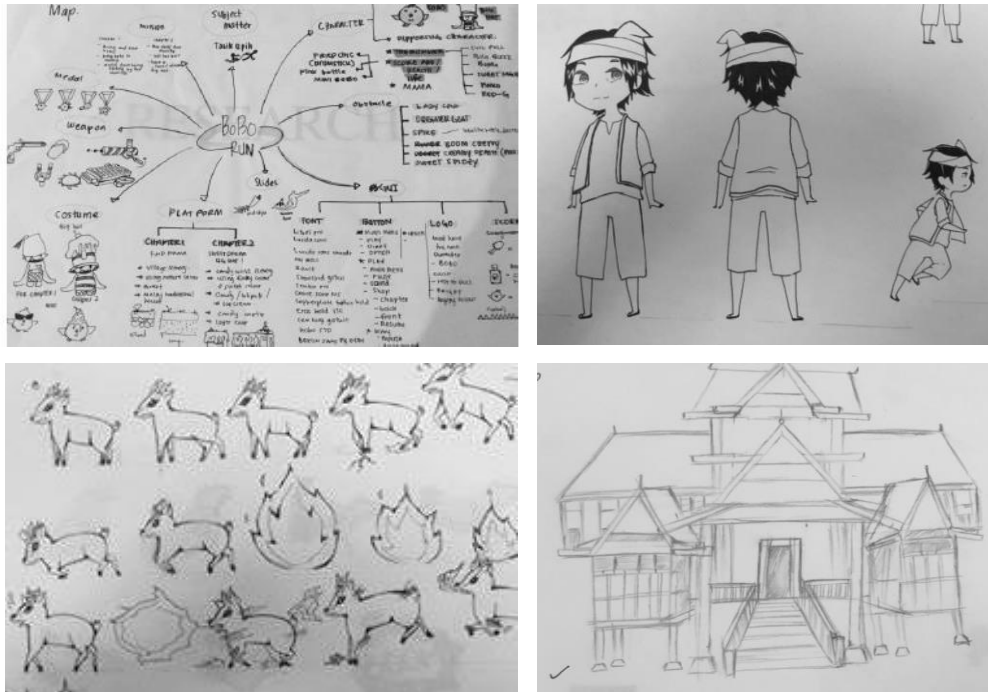

Figure 2 Mind Mapping & Initial Ideation Sketching

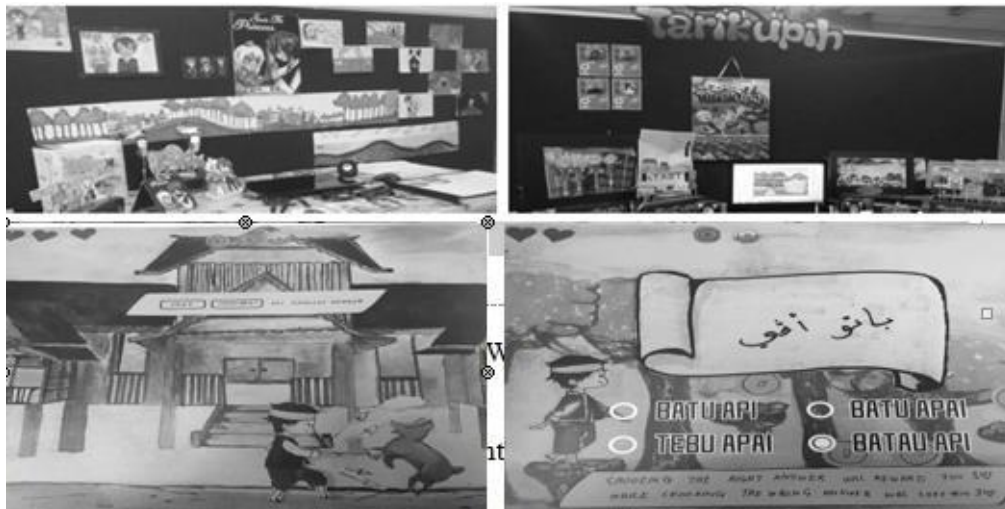**Figure 3 Characters, Environment and Props Design**

Figure 4 Example of Paper Prototype

Production Phase

Digital process is also important in the development of game design. This phase requires a lot of work and creativity in transforming ideas from manual sketches into outstanding interface designs. Currently for interface design, Adobe Illustrator, Adobe Photoshop and SAI software are used at this stage. In the digital process, it involves the process of digitalizing the design (tracing) according to the manual ideation using Adobe Illustrator software followed by inserting colors into the design layout to enhance the appearance of the game to make it look more appeal and attractive.
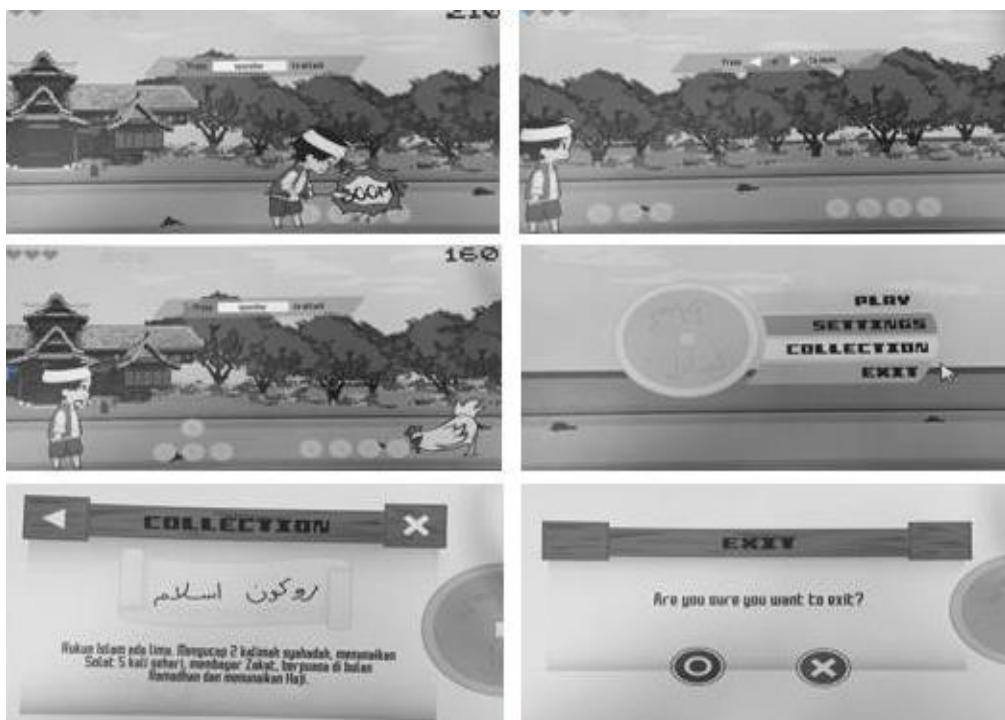

Figure 5 Digital Process for Interface Design

Post-Production Phase

The user interface (UI) is the intermediary between human and machine, between human and human or between machine and machine. Usually the interface of application will consist of elements such as screen background, windows and panels, control buttons and icons, text, graphics, audio, video, animation and so on (Jamalludin and Zaidatun, 2005).

The arrangement of the elements on the screen takes into account in aspects of display size, position suitability, and balance. In the programming process, Construct 2.0 software helps students a lot in ensuring that all elements such as text, graphics, audio and animation work together and function well to develop an effective and efficient digital game application. At this phase, the navigation process is also important by connecting each storyboard to liven up the game. In general, a simple navigation system is very much needed in a game application. This is in line with what was stated by Baharuddin et al. (2002), that is, in applying the principles of constructivism theory into the design of application development, then the application must be structured to be easily accepted by users, such as arranging modular learning content as applied in this game.

Furthermore, other elements should be included such as music background and sound effects to improve the quality of the game environment and promote an exceptional gaming experience. In addition, students also undergo prototypes on a regular and continuous basis with careful monitoring and guidance from the supervising lecturer to identify any problems in the programming process. At this stage as well, students will be monitored more often either content monitoring by lecturers from ACIS who teach CTU281 subject or monitoring in terms of application implementation in the pre-production, production and post-production phases by lecturers from FSSR who teach Interactive Design (GDT213) subject. Based on the sample of online feedback given by the respondents, it was found that the feedback given is positive and there are some comments and suggestions that can be adopted. Among the feedback received is that the respondents agreed with the proposal to use interactive learning medium in the classroom because it can increase the motivation and mood of students. In addition, the use of learning medium in the form of digital games can also help students' understanding of the topics learned.

In addition to data collection from online feedback samples, researcher also made direct survey (site observation) around the exhibition booth of AD111 students throughout the Islamic Art and Communication Festival (ISAC 2016). This program held on 20 August 2016 at Dewan Taming Sari, UiTM Alor Gajah Melaka whereby all the projects were evaluated by juries appointed to assess the level and quality of students' projects. According to Ustaz Shafie, the Project Advisor, some of the best products were selected to be part in Melaka International Intellectual Exposition (MIIEX 2016) competition. He felt that the students' projects at this time were very outstanding and this festival should be continued in the years onwards. The results of the study found that the students were very motivated with the result of their project in which two projects from the AD111 group were crowned as the Best Project beat the student's project from Department of Photography and Creative Imaging (AD117), Department of Fine Art (AD118) and Department of Industrial Design (AD114). This proves that AD111 projects able to attract the interest of the jury and the ISAC 2016 secretariat to select their projects as the Best Project of the FSSR Category. In addition, the program has proven that AD111 students are able to adapt the knowledge and skills they learned in GDT213 subject to meet demands and criteria provided in CTU281 syllabus in which becomes one of the main criteria for passing in this subject. In fact, one of AD111 projects also won the Gold Award at Melaka International Intellectual Exposition (MIIEX 2016) competition.

Figure 6 AD111 Project Exhibition Booth at ISAC Festival 2016 and Competition at MIIEX 2016

CONCLUSION

In conclusion, it is undeniable that the use of technology in the field of education promises great benefits to both lecturers and students. Given the importance of technology applied in the field of education, the researcher hopes that with the implementation of digital game-based approach, it can improve the quality of student's work and motivate students to be more focused and excellent in the courses taken as well as improve student performance, especially in Islamic study syllabus. In short, digital games will be a new approach that can be introduced to the learning environment. The idea to adapt Islamic content in digital game based learning approach is actually applicable to meet the needs of the mainstream which can enhance the motivation of students and at the same time still remain the Islamic aesthetic value and content for the course syllabus. Furthermore, this digital approach will help improve students' learning performance and cognitive skills as well as remain the good social relationships among peers through the spirit of group collaboration. Based on the findings of the study, it is hoped that it will be useful for other application developers in order to produce more effective and interesting educational game applications in the future.

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