

a group of 5-6 members based on the activity that has been done. The CTP assessments consist of Quiz 1 and Quiz 2 during week 6 and week 12, respectively, with a total of 25% mark for each quiz. Another 50% mark came from peer evaluation (10%), attendance (10%) and practical report (40%). All the accumulated score contributed to 100% of total grading. For the Semester 1 Session 2014/2015, POPBL was implemented. Students were divided into 10 groups with 4 to 5 members in each group. Throughout the implementation of POPBL, each group was given a special project and topic to be observed. Three main assessments were performed throughout the semester. During the three phases of assessments, the complexity of problems in the case study was equal. This was to ensure that students were exposed with real farm environment and knowledge are synchronized to the planned curriculum syllabus and theory that has been taken earlier or during the concurrent semester. This course was carried out in the open field and covered the topic of germination, crop management, harvesting, postharvest handling and marketing activity. The POPBL implementation contributes 25% to the continuous evaluation phase 1 (Week 2 to 7) and phase 2 (Week 8 to 12) which were judged by facilitators who are lecturers and field staff (10%) and peer evaluation (10%). At the end of the semester, student came up with complete data collection and report in the form of reflective journal based on the project and task given, which amounts to 30% of the course grade. All the accumulated score contributed to 100% of total grading for the POPBL.

Impact of CTP versus POPBL

The effectiveness of teaching and learning using CTP and POPBL methods was analysed. Result of study was discussed in the context of POPBL teaching technique to achieve learning outcome of the subject and how far the innovation can give impact to higher education learning compared with the CTP. To check the capability of students to produce and market the product, yield of product and marketable yield for both of semester were recorded. Mean of all data collection was calculated and compared.

Result of the final grade showed that POPBL is highly applicable for agriculture field study. About 60% of students from POPBL class scored grade 'A' compared to 35% of student from CTP class. Based on the conducted survey and our observation, it was realised that the students' achievement in POPBL class depends on several factors such as prior background program, student participation in handling project activities, and motivation towards ensuring the success of the project based on hands-on experience. In terms of capability of students to produce and market the product, the result shows that the POPBL class was able to produce 492.28 kg of sweet potato yield. With the selling price of RM7/kg, they managed to collect a total profit of RM 2512.80. On the other hand, the CTP class did not produce any yield and generate any profit.

Therefore, students undergoing POPBL successfully achieved the learning outcomes. We observed that students were highly motivated to finish the project as they could see the impact of different treatments applied to different groups on the specific project given to them. The students improved their soft-skills (communication between teammates and planning) as well as their technical skills such as solving the real-field problem, designing the structured solutions, packaging the product and developing marketing strategy. With this successful outcome, it is our hope that our experiences on POPBL implementation in the fieldwork for agricultural students could motivate ourselves as well as other lecturers in applying POPBL in our teaching and learning activities.

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33. VIEW: A 3D VIRTUAL LEARNING ENVIRONMENT FOR INTRODUCTION TO MULTIMEDIA SUBJECTS USING COOPERATIVE LEARNING APPROACH

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Introduction

Rapid advancement of technology can simplify and speed up communication processes. The development of information and communication technology (ICT) for instance, has allowed various learning activities to be conducted virtually. Some of the activities that have extensively exploited such a technology are cooperative and collaborative learning, in which ICT can strongly support the vital elements of the learning activities. The elements of these activities are interaction and communication between students, which are often carried out in a two-dimensional virtual learning environment (2-D VLE) by utilizing Web 2.0 applications such as chat rooms, online discussion forums, social networking sites, and blogs. Despite being extraordinarily capable of supporting online learning activities, ICT has several drawbacks. The technology is limited to text-based communication; it provides less support in the use of nonverbal communication to convey messages; and it provides users with limited tools to collaborate. These limitations make the applications inferior in supporting communication and interaction hence the learning activities performed in a VLE are considered very limited and not realistic since they are executed merely through text conversations or discussions without any other forms of interactions. Several problems have emerged from these limitations, particularly on students' interaction, participation, motivation, satisfaction and sense of presence. Therefore recently, a three-dimensional virtual learning environment (3-D VLE) or a virtual world has been utilized as a platform of online learning as it possesses potentials in supporting online and virtual learning. However, 3-D VLE is still new in Malaysia, especially at Universiti Teknologi Malaysia (UTM), although it is very beneficial for online learning and especially for distance

learning programs. Therefore, this study was conducted as a kick start in bringing 3-D VLE into the teaching and learning in UTM. Moreover, we also studied the benefits obtained through its application. At this moment, this study was only conducted in one of the UTM SPACE diploma classes which is Introduction to Multimedia (DPT3163) class.

Teaching Innovation

Therefore, a 3-D VLE called (Educational Virtual World) was developed in this study to be used as an online learning platform to carry out several learning activities. The learning activities on the other hand, were constructed in the form of cooperative learning. In terms of development of ViEW, the Open Wonderland application has been used to develop the 3-D VLE. Open Wonderland is a java-based, open source virtual world application that provides tools to the developers to construct a 3-D VLE based on their demand. We used some existing objects in the Open Wonderland to build the environment. In addition, we also build some of 3-dimensional objects using the Google SketchUp software, such as a main building, meeting rooms, chairs, tables and so on. We ensure that the design of the built environment is suitable for cooperative learning activities. In terms of structuring cooperative learning activities in ViEW, we have implemented Johnson & Johnson's (1999) cooperative learning theory and Salmon's Five-Stage Model of Learning in Second Life (2010). This is to make sure that the learning activities would run smoothly and also ensure that cooperative learning really occurred in the virtual world. The development processes takes more than six months to complete. ViEW that has been completely developed were then placed on a Faculty of Education server to enables it to be remotely accessed by other computers. Then some testing phases were carried out to make sure ViEW can smoothly function before it was used in the class. Furthermore, the pilot testing was also conducted among expertise to validate the content and design of ViEW.

ViEW was officially employed in the DPT3163 classroom during the 2nd semester of 2013/2014. Before the start of the learning activities, each student was assigned into a group. Each group was coded with a unique colour, name, and logo, and each participant was given his or her own workstation with a computer and a headphone. The workstations of participants from the same learning group were located at different sections to avoid any direct communication and interaction between them. Afterwards, the first training session was conducted to make sure that the participants were familiar with ViEW and that they learned how to do basic things in the environment such as navigating the world, changing the camera views, customizing the avatar, as well as inserting and manipulating objects. The second training session was held a week after. Then for several weeks, a cooperative learning activity in ViEW was carried out. Each session allocated approximately 90 minutes and covered different topics. During the learning session, every group was encouraged to use all tools provided and also utilized all the communication channels supported by ViEW. Scores of individuals and groups have been awarded to the students based on their presentation of the discussion, exercises and quizzes. So far, all the learning activities in ViEW were only conducted in a computer laboratory, not remotely as we feel that it was better to carry it out in the laboratory at this early stage of its application. So that we can gather some useful input before we began to implement it for real distance learning.

Impact

There were three forms of evaluation conducted in this study in order to examine the impact of cooperative learning in ViEW towards the students. There were the evaluation in terms of academic performances, their interaction and communication while they were learning in ViEW, and also their sense of presence in ViEW and satisfaction towards the approach. In terms of evaluating students' academic performances, several methods have been used. The first is through a weekly quiz scores, which scores obtained by the majority of students were encouraging in every week. The second method is through pre and post test which covered all the topics learned by the students in ViEW.

Statistical analysis showed that there are significant performance improvements between students' scores in pre and post test. While interaction and communication of the students were evaluated by analyzing the recorded video of the learning activities using the content analysis technique based on a coding scheme which is related to cooperative learning. The results of this analysis indicate that the frequencies of seeking input and contributing about the tasks and also technical matters among the students were high. Therefore it shows that majority of the students were active during the learning process and none of them was a sleeping partner. In terms of satisfaction and sense of presence, it was assessed through questionnaires that were distributed to the students upon completion of all learning activities. Based on statistical analysis that has been carried out, the findings showed that scores of social presence, place presence and co-presence were high, thus showing that the students can feel that they were really in the virtual world along with their friends. From the interview conducted with several selected students, they were satisfied with the cooperative learning in ViEW. They feel that learning in 3-D VLE was enjoyable and has great potential to be further implemented in all subjects.

From the positive and encouraging findings obtained in this study, it shows that ViEW has a bright future in our country educational field. It can also be expanded as a learning platform for other subjects such as history, science, language learning and so on. Moreover, further research into it can also make ViEW beneficial as an online learning platform for distance learning provided in UTM and other institutions. Thus it can have a major impact on the field of higher education in Malaysia if its usage is extended.

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