Engaging students in a multimedia cooperative-learning environment: A Malaysian experience

Tse-Kian Neo, Mai Neo and Joyce W.J. Kwok
SMILE, CEMKA, Faculty of Creative Multimedia
Multimedia University, Malaysia

This study focuses on developing a cooperative learning environment to promote active learning. Within this learning environment, multimedia technology and the use of Web 2.0 tools, namely, blogs were integrated to provide the students the opportunity to learn on their own as well as to document their process and experience within this cooperative learning environment. The purpose of the study is to determine its impact on student learning, their perceptions and learning experiences. Surveys were administrated to students to ascertain their reactions towards this learning environment. The results were encouraging as students managed to cooperate with each other to accomplish their common goal. The use of blogs served as a tool to enhance team cooperation and to foster a learning community within the class. This multimedia enhanced cooperative environment proved to be a viable alternative to the traditional classroom and was an effective strategy to enhance the students' learning process.

Keywords: cooperative-learning, blogs, multimedia, Web 2.0

Introduction

For decades, traditional lectures have primarily been the mode of teaching and learning used in the Malaysian educational system. Though this method of transfer still has its merits, it has limited advantage in today's IT-oriented world. With the advent of multimedia as well as the Internet, new instructional strategies of transferring knowledge have come into being (Motschnig-Pitrik & Holzinger, 2002). By utilizing the multimedia technologies through the web, the nature of interactivity and use of multiple media in learning enhance the students' learning process and is a beneficial alternative to passive traditional learning (Dawson, 2008). The issue that surrounds many Malaysian educators today is that there is a need to adjust the educators' approach to teaching, preparing content and delivering learning materials in accordance with existing ICT technologies. As such, the Malaysian Government is encouraging teachers to integrate technology into the classrooms to effectively engage their students through self-directed, student-centred learning environments (Mohaiadin, 2000).

Many studies have found that team-based project-based activities promote active learning (Hung & Wong, 2000; Bennet, Harper & Hedberg, 2001), and therefore these activities are important elements to explore and study. Currently, with increased emphasis on social constructivism, cooperative learning is partly a reaction to societal changes which focuses more on team work as communication skills are becoming increasingly more important in the knowledge-based society (McWhaw, Schnackenberg, Sclater and Abrami, 2003). Cooperative learning represents a shift from a teacher-centered approach to a more student-centered learning in small groups. Therefore, it creates an excellent opportunity for students to engage in problem solving with the help of their group members instead of solving the problem individually (Effandi & Zanaton, 2007).

Learning through cooperation

In a cooperative learning environment, students are required to work in teams to complete a common task (Alessi and Trollip, 2001). The theoretical framework which underlines this cooperative learning environment is social constructivism as propounded by Vygotsky (1978). In this learning mode, students

learn by interacting socially with their peers and teacher to achieve their learning goals. Learning, as suggested by Vygotsky, is a social activity.

This approach to learning encourages students to learn content through group activities where they interact with each other, discussing, brainstorming and exchange information and knowledge, and work as a team to achieve the common learning goals. This learning mode is thus constructivist in approach and student-centred (Neo, 2003; Herrington, Oliver, Reeves & Woo, 2007). It engages students in active learning, determine their own learning paths, and encourages them to cooperate with each other as a team to seek knowledge and information to achieve their learning outcomes.

Research has found that cooperative learning enables the students to develop critical thinking skills, communication skills, organisation skills and others. Thus, more students are made to work with each other to make them ready for the job market. Cooperative learning also fosters interpersonal competencies among the students such as *oral communication; active listening; group leadership; the ability to examine assumptions; and the ability to tolerate ambiguities. All of these skills are highly valued in employment* (Tribe, 1994). Cooperative learning generates conversation, discussion, debate and relationship-building among the students in the group and encouraging them to work well collectively (Neo, 2005).

According to Johnson and Johnson (2003), the elements that are found in cooperative learning include positive interdependence, individual accountability, promotive interaction, social skills and group processing. In other words, the members within the group must perceive their goals to be related for them to work together and achieve their common goal. The individual accountability element suggests that individuals within the group must be made to feel that their effort contributes to the common goal. By doing so, the individuals will be more motivated to contribute. As such, if the person within the team is made to feel that he or she is needed, he or she will be more inclined and motivated to cooperate with the rest of the members (Johnson and Johnson, 2003). Also, increased individual accountability tends to increase the perceived positive interdependence among group members (Archer-Kath, Johnson and Johnson, 1994). Cooperative learning also promotes interaction between group members. The social skills that are needed to have effective cooperation include communication skills, leadership skills, decision-making skills, and conflict management. Through discussions and effective group communications, members within the groups are able to sustain the overall inter relationship among the group and therefore, cooperate with one another effectively.

Web logs or blogs

With the availability of multimedia and Web 2.0 applications, the students were able to utilise various applications such as web-based learning module as well as web-logs or blogs as tools in their learning process. Web logs or blogs, which are currently categorised as a Web 2.0 application, are currently being incorporated in many teaching and learning strategies. Many educators are using blogs to promote interactivity and self-reflection in their students learning process. As Williams & Jacobs (2004) explain, the popularity of using blogs is its scope for interactivity. Since blogs provide the space for individuals to voice their opinions and expression, bloggers are given the sense of personal empowerment and belonging to the learning community at large (Farmer, Yue and Brooks, 2008). Blogs can be used as tools to encourage learners to become more critical in their learning process. By writing in a blog, students are able to express their own opinions and to deal with opinions and comments by other students in the classroom.

In this study, a cooperative learning environment using multimedia and web technologies was developed to provide the learners with an active and authentic learning environment. As such technological tools such as web-based learning environment as well as blogs were integrated into this cooperative structure to allow the students to interact as well as learn from each other. In this context, blogs were used as an online learner's journal to document the process of creation. The purpose of this study is to move away from the conventional method of teaching and to provide the students with an active constructivist learning environment to gauge their attitudes and perceptions.

The study

The study was conducted on a second year course, Digital Media 1. This course was a compulsory subject given to all of the students in the Faculty of Management enrolled in several Bachelors in Business Administration (Economics/ Marketing/ Management with Multimedia). The objective of the course is to provide an overall view of multimedia as well as content creation. The course is a 14-week course and

consists of 34 students (n=34). As such, a final term project was assigned to provide them with both the skill and understanding of digital content creation. The project was a semester long which required the students to work in groups of 5 to 6. Therefore, a cooperative learning environment was set up for each group to complete the task. The project was to create a website based on the theme Malaysian Culture and Heritage. The students were aged between 20-24 years old and almost all of them do not possess any prior knowledge in multimedia knowledge as well as skills. In addition to the classroom lectures, the students had to go to tutorials to learn the necessary skills to complete the course. They were taught basic skills in using Adobe Photoshop, Dreamweaver and Flash.

Table 1: Activities that took place within the cooperative learning environment

Activities	Description
Forming cooperative teams	At the beginning of the semester, the students were informed about their final project. Thus, the students were tasked to form groups of 5-6 members. They were instructed that it was their responsibility to find teammates whom they could work with.
Initial Proposal	Students formed groups and decided on the aspect of the theme Malaysian Culture and Heritage. Once the topic had been chosen, they then had to come up with an initial proposal which consists of the title, team members and team leader, their objective, target audience characteristics that have been researched upon, references and minutes of meetings. These proposals were to be submitted to the lecturer for approval.
Teacher facilitation & Multimedia learning environment	The course was a 14-week course whereby the students were given lectures on media characteristics as well as multimedia content creation. Besides lectures, discussion and consultation sessions were given to facilitate any queries the students may have regarding their project. This was to facilitate their learning process. In addition to lectures, students were required to use several multimedia web-based learning environments. The purpose of this is to provide the students with a student-centred learning environment and to provide them the opportunity to learn outside of the classroom. The module was designed based on Gagne's Nine Events of Instructions. As such based on his Nine Events, the multimedia learning environment can be considered as a good lesson design should it acquire the nine events and instructions as put forth by his instructional theory (Gagne, Briggs, & Wagner, 1992; Teoh & Neo, 2007). One of the topics chosen for this web-learning environment was Digital Sound (see Figure 2).
Developing cooperative plan using blogs	Based on the discussions in class as well as meetings, the students developed their cooperative plan for implementation. Their cooperative plan would include an updated proposal, their goals, design strategies, storyboards, flowcharts and information on their topic of interest. Students were required to discuss among themselves the goals and objectives and the manner in which the website was to be created. They were required develop their blogs and posts their discussions, ideas as well as any new found content and newfound information on the project at anytime anywhere. These made up their cooperative plans. They were required to update their blogs regularly and to post images, references as well as their sketches, graphical user interface (GUI) layout (see Figures 3 and 4) and site maps of their website in them to develop their cooperative plan. Students from other groups were encouraged to comment each others work on the blog as well. The lecturer had to approve the plan via commenting on the blogs as well.
Multimedia Authoring Process (MAP)	Teams applied the Multimedia Authoring Process (Neo, Neo & Rafi 2004) to develop their multimedia website. The MAP acted as a guide for the students to construct their multimedia-rich website using the knowledge and skills learnt in the class. Each group had to rely on each other expertise in order to create the final website. The steps in the MAP included the Pre-authoring process (Media Acquisition, Media Conversion to Digital and Media Editing), Authoring Process (Synchronising media according to plan, Adding Interactivity and special effects and testing) and Post-authoring process (Conversion to Shockwave Flash and Burning the finished application to a CD)
Presentation & Submission of completed website.	Prior to the completion of their project, students had to present to the whole class their working prototype and be ready to receive comments from the lecturer and course mates. Once the project was completed, the students submitted their report containing the modified proposal, flowcharts and any material they used in developing their application as well as their final application (see Figure 5) to the lecturer.

Activities

In this cooperative learning environment, students were to work in groups to select an aspect of the theme which was Malaysian Culture and Heritage. For example, students were allowed to choose various aspects such as People, Food, Historical Sites and so on, just as long as they were related to the overall theme. As such, each student group were to work together as a team and cooperate with one another to complete the task. Below in Table 1are the activities that took place within this learning environment and Figure 1 illustrates the conceptual framework of the learning environment.

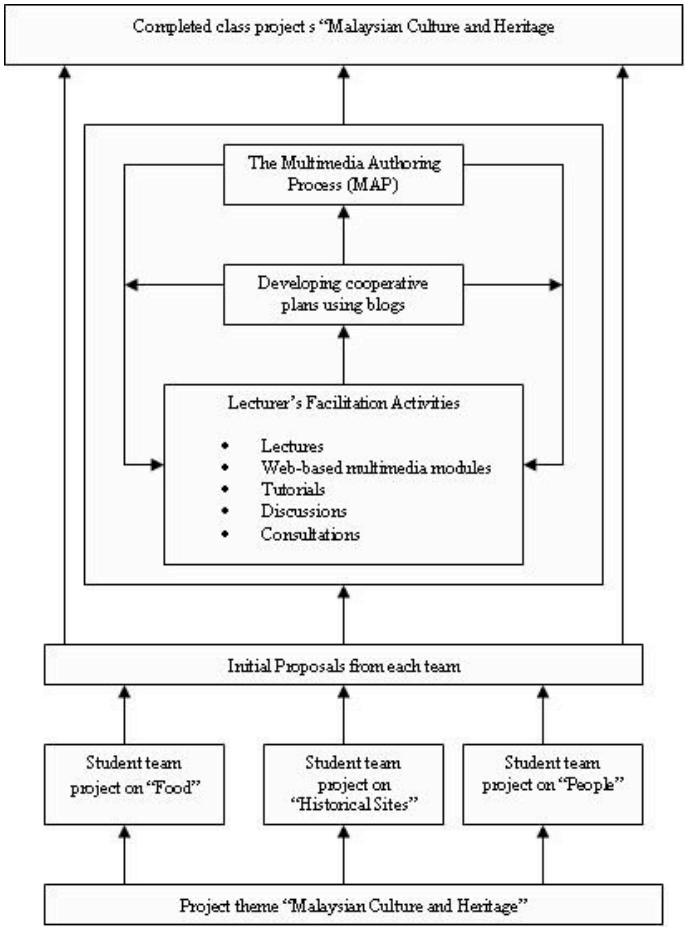

Figure 1: Conceptual Framework of the Multimedia Cooperative Learning Environment

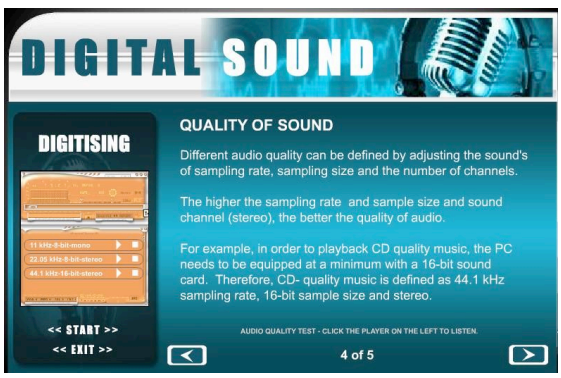

Figure 2: Web-based learning environment

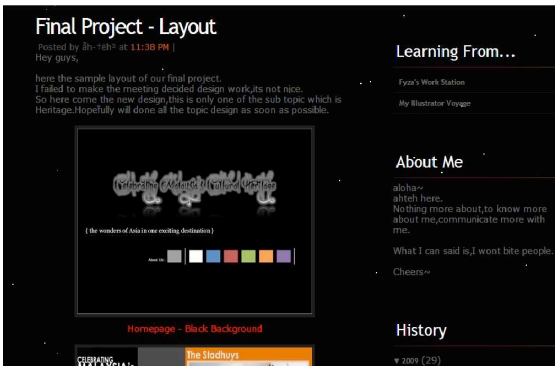

Figure 3: Student blog entry on GUI layout

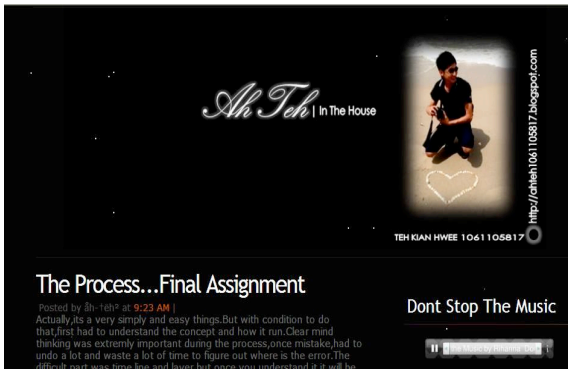

Figure 4: Process of creation

Figure 5: Sample screen shot of the final website

Data analysis and results

Two Likert-scale surveys were administered to the students in this cooperative learning environment to obtain their attitudes towards this learning environment. The Likert scale used in both surveys was from 1 to 5 (1=Strongly Disagree (SD), 2= Disagree (D), 3=Undecided (U), 4=Agree (A) and 5=Strongly Agree (SA)). The first survey had 11 items and was used to obtain the students attitdues towards the cooperative learning environment. While the purpose of the second survey, which has 10 items, was used to obtain the students attitudes using blogs as their documentmentation process. It was also important to note, the students have never worked in a cooperative learning environment previously nor have they ever created a blog before this assignment. This would be their first experience for doing so.

Table 1 below shows the results of the cooperative learning environment survey (items 1-11) as well as the blog survey (item 12-21). The tables breakdown the Likert scale items as well as the frequency (f), percentage (%), mean (M) and standard deviation (Std Dev) of each item in this 11-item survey. As for reliability of the surveys, according to Lim, Khine, Hew, Wong, Shanti, and Lim (2003), a reliability of above 0.6 is deemed to have satisfied the reliability of the survey. The overall reliability or the Cronbach's Alpha of the cooperative survey and blog survey were 0.8942 and 0.7501 respectively. Thus, both surveys were deemed reliable. The items in both surveys are shown in descending order of the resulting means.

From the results presented in Table 1 above, the students had very positive experiences learning in the cooperative learning environment. The means results of the survey were very positive as they ranged from 4.09 to 4.45. The means from the survey show that they were able to cooperate with each other and enjoyed doing so. They knew the importance of being cooperative with their team in order to complete the project. As for the results from the blog survey, the students' attitudes towards it were also positive. The resulting means ranged from 3.97 to 4.56. This indicated that they found writing in blogs useful in their learning process. The blogs allowed them to express their ideas and were helpful developing their plan for implementation of their project. The students also indicated that they had a good experience developing their blogs as this was their first time doing so. Overall, the students were able to learn in this cooperative learning environment and liked using blogs as part of their learning process.

Discussion

The study sought to discover the students learning experiences in a cooperative learning environment. From the study, there were several factors that resulted from the students working in a cooperative learning environment. Students were required to cooperate with each other and use multimedia technology as a means to construct knowledge in their learning process. In addition, blogs were used as part of their learning process. Besides the surveys, an additional open-ended questionnaire was given to the students to obtain the students' feedback in this learning environment. The comments of the students are presented as part of the discussion below. The overall results found in this study are the following:

Able to cooperate as a team

From the results, the students indicated that were able to cooperate with each other. They understood the importance of cooperating with their teammates in order to help each other to complete the project. The results show that they were able to cooperate with their teammates (Item 2; M=4.32, Std Dev=0.589) and

Table 1: Results of the cooperative learning and blog surveys

No	Survey	SD f (%)	D f (%)	U f (%)	A f (%)	SA f (%)	Mean (M)	Std Dev
Cooperative Learning								
1	I found the project challenging	0 (0.00)	0 (0.00)	0 (0.00)	18 (52.9)	15 (44.1)	**4.45**	0.506
2	I was able to cooperate with my teammates	0 (0.00)	0 (0.00)	2 (5.9)	19 (55.9)	13 (38.2)	**4.32**	0.589
3	The cooperation was a challenge but I enjoyed it	0 (0.00)	0 (0.00)	2 (5.9)	19 (55.9)	13 (38.2)	**4.32**	0.589
4	The cooperation enhanced my learning of the topic	0 (0.00)	0 (0.00)	0 (0.00)	24 (70.6)	10 (29.4)	**4.29**	0.462
5	My group members contributed well to the project	0 (0.00)	0 (0.00)	3 (8.8)	19 (55.9)	12 (35.3)	**4.26**	0.618
6	I enjoyed cooperating with team members	0 (0.00)	0 (0.00)	1 (2.9)	25 (73.5)	8 (23.5)	**4.21**	0.479
7	My group communicated well with each other	0 (0.00)	0 (0.00)	1 (2.9)	26 (76.5)	7 (20.6)	**4.18**	0.459
8	My group was able to work together effectively	0 (0.00)	0 (0.00)	2 (5.9)	24 (70.6)	8 (23.5)	**4.18**	0.521
9	We were able to solve our problems as a group	0 (0.00)	0 (0.00)	1 (2.9)	26 (76.5)	7 (20.6)	**4.18**	0.459
10	I knew exactly what my part was in the team	0 (0.00)	0 (0.00)	3 (8.8)	23 (67.6)	8 (23.5)	**4.15**	0.558
11	I felt satisfied with my contribution in this project	0 (0.00)	0 (0.00)	4 (11.8)	23 (67.6)	7 (20.6)	**4.09**	0.570
N=34. Cronbach's Alpha=0.8942								
Use of Blogs								
12	I was comfortable using blogs in my class.	0 (0.00)	0 (0.00)	0 (0.00)	15 (44.1)	19 (55.9)	**4.56**	0.504
13	Overall, using blogs in my learning was a good experience.	0 (0.00)	0 (0.00)	1 (2.9)	13 (38.2)	20 (58.8)	**4.56**	0.561
14	Having written entries in my blogs helped me remember activities from what I had previously learnt.	0 (0.00)	1 (2.9)	2 (5.9)	16 (47.1)	15 (44.1)	**4.32**	0.727
15	I like using blogs in my learning process	0 (0.00)	0 (0.00)	4 (11.8)	16 (47.1)	14 (41.2)	**4.29**	0.676
16	I used blogs to compare my assignments to my course mates' assignments	0 (0.00)	1 (2.9)	4 (11.8)	15 (44.1)	14 (41.2)	**4.24**	0.781
17	Using blogs helped me to learn better	0 (0.00)	1 (2.9)	6 (17.6)	14 (41.2)	13 (38.2)	**4.15**	0.821
18	Using blogs help me be a more independent learner.	1 (2.9)	0 (0.00)	4 (11.8)	18 (52.9)	11 (32.4)	**4.12**	0.844
19	Blogs help me learn outside the classroom in an informal manner.	0 (0.00)	1 (2.9)	5 (14.7)	18 (52.9)	10 (29.4)	**4.09**	0.753
20	The comments by the teacher were helpful.	1 (2.9)	1 (2.9)	8 (23.5)	10 (29.4)	14 (41.2)	**4.03**	1.029
21	The comments on my work were helpful to improve my learning process	1 (2.9)	2 (5.9)	5 (14.7)	15 (44.1)	11 (32.4)	**3.97**	1.00
N=34. Cronbach's Alpha = 0.7501								

enjoyed working in this cooperative learning environment (Item6: M=4.21, Std Dev=0.479). Team members also found that the groups that they were with could work efficiently with one another (Item 8: M=4.18, Std Dev=0.521). Thus, the groups were successful and able to work with each other to complete their task. The survey also indicated that the groups worked well with each other as the majority of the students responded positively to the items in the survey. The students felt that their group members contributed to the completion of the project and communicated well with each other (Item 5: M=4.26, Std Dev=0.618). They also felt that they worked well together to solve problems (Item 9: M=4.18, Std

Dev=0.459) and were able to communicate with each other (Item 7: M=4.18, Std Dev=0.459). To validate the findings, below were some of the students' comments from the open-ended questions based on their view when working in cooperative teams.

> Student 1: It is great to say that the teamwork between me and my group members was a success. We can discuss and communicate without quarrel and considerate one another opinion and situation. I was inspired with the working spirit by my group members as they are patient and smart.

> Student 2: Cooperation from each group member is the main aspect to succeed. From my overall experience of this project, me and my team had a quite good understanding in each other and give a balance commitment to produce this final output. We have discussed many things to accomplish something and to handle problems during this project. We also have divided works to each other to smoothen the process of creating this project. From this project, I relies that participation from each group member in accomplish a goal is very important.

Challenging and fun

As for working in a cooperative environment, the students found it challenging. The results indicated that the project given to them was challenging (Item 1: M=4.45, Std Dev=0.506). This was primarily because it was their first time to create a website as they had no prior experience creating digital content. They also indicated that they found cooperating with their course mates a challenge but had enjoyed the experience (Item 3: M=4.32, Std Dev=0.589). They also indicated that they manage to enhance their learning of the subject matter while working in a cooperatively (Item 4: M=4.29, Std Dev=0.462). Since it was their first time doing so, they were not used to working cooperatively on a project. Many were confused to what they needed to do in the beginning but at the end of their experience they indicated that they had fun learning in such a manner. Some of the students' comments when asked to provide feedback on their experience working in a cooperative environment are shown below.

> Student 1: Through the whole process I think it was definitely a very wonderful experience. It was definitely very fun doing all this research and seeing how others progress. Definitely the project had given us more in depth about how a website is being created.

> Student 2: For me doing this assignment is fun because this task needs me to cooperate with my team for making this assignment successful. So to be honest, I like this project very much. This project gives me an opportunity to know my team closely.

Individual accountability

Although the students were working in group, individually the students understood their role within the group. The results in the survey showed that each member of the teams knew exactly what their role was in the team (Item 10: M=4.15, Std Dev=0.558). Individually, the students felt satisfied with their contribution in this project (Item 11: M=4.09, Std Dev=0.570). Some of the comments from students are presented below when asked their opinion on their individual responsibility when working in a cooperative team and if they are satisfied with their individual contribution:

> Student 1: I am in-charge of festivities in the culture and searched for information and data, design my festivities interface. I am satisfied with my work. With not much time and lack of digital design knowledge still able to produce this good output.

> Student 2: As group leader, I lead my group to the correct direction. I am very satisfied with my work and leadership abilities.

Blogs as learning tools

From the use of blog survey, the results showed that the students were able to use the blogs as part of their learning process in doing their assignments. They found blogging a good experience in their learning (Item 13: M=4.56, Std Dev=0.561). The students indicated that by writing in blogs, they were able to remember the activities they had done and learnt (Item 14: M=4.32, Std Dev=0.727). This was an important feature in the blog as by doing so, it allowed the students to reflect on their work and to learn from them. Also, the majority of students liked using the blogs as part of their learning process. (Item 15:

M=4.29, Std Dev=0.676) and found that using the blogs help them learn better in this cooperative learning environment (Item 17: M=4.15, Std Dev=0.821).Overall, the blogs served as an important tool in the cooperative learning environment. The students enjoyed using it and found blogging useful in their learning. To further strengthen this finding, below are some of the feedbacks from students about whether they liked using blogs and how blogs improved their understanding of the assignment:

> Student 1: Yes! Able to reflect my understanding of the assignment and challenged my learning process as well as helped me learn outside the classroom
> Student 2: Yes. Able to exchange opinions, interact with the team mates and learn from each other

Independent learner

The results from the use of blog survey indicate that the students were satisfied to use the blogs as a learning tool in this cooperative learning environment. All the students were comfortable using the blogs (Item 12: M=4.56, Std Dev=0.504). They found using the blogs made them a more independent learner as they could continue to work on their own (Item 18: M=4.12, Std Dev=0.844). The results also determined that the majority of the students were able to do their assignment outside the classroom on their own in their informal manner (Item 19: M=4.09, Std Dev=0.753). For further support, below are the comments from students when asked if blogs allowed them to become more independent learner.

> Student 1: The blogs help me arrange my thought and makes me want to submit my work on the blogs on time
> Student 2: I become a more independent on doing my coursework. I can understand more on what I had learn and I can get information on how my friends to their work.

Learning community

Using blogs to document the process of developing the students' website in the cooperative learning environment was very helpful to create a learning community in the class room. Students were also able to compare their work with other groups in the cooperative learning environment. They were able to see other groups work and designs which the majority of students found this helpful in their learning (Item 16: M=4.32, Std Dev=0.727). This feature allowed the students in this cooperative learning environment to form a learning community within the class. Students were able to share their work in progress and documentation with other students and the lecturer. Also they were able to leave comments to further enhance their work. The majority of students found the comments made by their peers to be useful to help them improve their work (Item 21: M=3.97, Std Dev=1.00) as well as comments left by their lecturer (Item 20: M=4.03, Std Dev=1.029). To further justify this finding, below are some of the students comments on how they felt about sharing their work with other students. However, a small minority of the students did not find the comments by the lecturer and peers blogs useful. This was probably due to the fact that this was their first experience using blogs and they did not receive positive comments from both the teacher and their peers.

> Student 1: They help me to learn new skills by viewing other students work
> Student 2: Exchange ideas and comments, source of reference for projects and exchange knowledge.

The overall analyses of the results indicated that the students were able to enjoy working in a cooperative environment to help one another complete a common goal and liked using blogs as part of their learning process. The results also showed that the students were actively participating in their learning process individually and as part of a learning community.

Conclusion

In this study, students were required to work cooperatively to develop a multimedia website. Students constructed their concepts and knowledge based on the knowledge found in this cooperative learning environment and become active participants in their learning process. By working in teams, the students were able to learn to socially negotiate with one another and learn from each other to achieve their common goal, thus providing evidence that learning is social activity (Vygotsky, 1978). They were able to enhance team work skill and improve their leadership skills, communication skills and interpersonal skills through presentation and in dealing with their team mates (Archer-Kath, Johnson and Johnson, 1994). They were aware of their individual responsibility and were motivated to cooperative with their

members as indicated in the results and suggested by Johnson and Johnson (2003). As such, students assumed the role of the producer rather than the consumer of information while the lecturer acts as a facilitator to provide guidance and consultation. With the use of blogs, students, peers, team mates as well as the lecturer were able to comment on their process. As the results indicated, the students liked developing and using blogs because they served as an effective learning tool and helped foster a favourable learning-space and community in and out of the classroom (Farmer, Yue and Brooks, 2008). Thus, this learning environment contributed to growing societal need for individuals who are able to work in teams and communicate effectively.

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Authors: Dr Tse-Kian (Ken) Neo, Senior Lecturer & Group Leader of SMILE, Faculty of Creative Multimedia, Multimedia University, Malaysia. Email: tkneo@mmu.edu.my

Dr Mai Neo, Associate Professor, Member of SMILE, Faculty of Creative Multimedia, Multimedia University, Malaysia

Joyce Wai- Jing Kwok, Research Officer, Member of SMILE, Faculty of Creative Multimedia, Multimedia University, Malaysia

Please cite as: Neo T.K., Neo, M. & Kwok, W.J. (2009). Engaging students in a multimedia cooperative-learning environment: A Malaysian Experience. In *Same places, different spaces. Proceedings ascilite Auckland 2009*. https://doi.org/10.14742/apubs.2009.2189