Using Social Media-based Cooperative Learning to Enhance Pre-Service Teachers' Computer Multimedia Instruction Performance

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Abstract: This research is to study the cooperative learning on Facebook that is a popular social community in Thailand. Several studies have found that participants are willing to share personal information and to learn how to do things on Facebook. There is integrated to learning approach so that to enhance students' learning in the development of computer multimedia instruction course that is special topic for pre-service teachers. The 31 students in experimental group learned on social network site as a cooperative learning, while the 28 students in the control group learned with traditional face-to-face classroom. The results of this research illustrated that the learning achievements of students in the experimental group were significantly better than students in the control group. In addition, these findings indicate that the students in experimental group not only have positive attitude, but also have high level of satisfactory.

Keywords: Facebook, computer multimedia instruction, cooperative learning, pre-service teachers

1. Introduction

Today, Facebook has become a popular social network in the world and continues to increase (Hayes, van Stolk-Cooke and Muench, 2015). Especially, in education area, many educators have attempted to implement Facebook in the educational context. They have found that it is not only possible to easily send, receive and share information, but also to facilitate communication, interaction and cooperation with different people, companies and organizations in different parts of the world using various modalities such as writing, pictures, video or link sharing, voice or video chat (Bowman and Akcaoglu, 2014; Korfiatis, Zicari and Lytras, 2015; Li, Chen and Popiel, 2015) and supporting on argumentative learning in Facebook (Tsovaltzi, Judele, Puhl and Weinberger, 2015). Several studies have presented using Facebook to promote students' learning in many countries. For example, Chang and Lee (2013) presented the trust in such facilitators in the Facebook community influenced the development of students in the writing of business plans in order to model in Taiwan. Milošević, Živković, Arsić and Manasijević (2015) used SEM methodology (Structural Equation Modelling) to examine the attitude of students towards Facebook as virtual classroom, through consideration of its acceptability level students in Serbian. Ainin, Naqshbandi, Moghavvemi and Jaafar (2015) presented the impact of Facebook usage on students' academic performance of Malaysian university students in Malaysia. Akbari, Pilot and Robert-Jan Simons (2015) presented Facebook group learning a foreign language in terms of autonomy with SDT theory for the Iranian Ph.D. students. In addition, many studies have explored the importance of Facebook usage. Peters, Winschiers-Theophilus and Mennecke (2015) presented the cultural influence of engaging social network of undergraduate students in the United States and Namibia. Abbas and Mesch (2015) investigated the role of variations in the cultural values and attitudes of young people and their association with the motivations for using Facebook of students in the private and public Arab high schools in Israel. Nam (2014) presented the effects of trust and constructive controversy on student achievement and attitude in

online cooperative learning environments. Several studies have investigated a variety of factors affecting use of social networking sites such as life satisfaction influence the intention (Oliveira and Huertas, 2015) or gender effects and cooperation styles (Korfiatis et al., 2015).

In this study, we proposed new learning approach to enhance students' learning in the development of computer multimedia instruction course, which is the part of special topic of pre-service teachers. The objective of this course is to motivate the students to develop multimedia instruction in groups. Therefore, we focused on the process of cooperative learning to enhance students' learning because the cooperative learning is an approach to groupwork that minimizes the occurrence of those unpleasant situations and maximizes the learning and satisfaction that result from working on a high-performance team. Cooperative learning refers to work done by members of team producing a product, creating a project, or the design of a product under conditions that satisfy five criteria: (1) positive interdependence, (2) individual accountability, (3) face-to face interaction for at least part of the work, (4) appropriate use of interpersonal skills, and (5) regular self-assessment of team functioning as shown in Table 1 (Felder and Brent, 2007).

Table 1. Cooperative learning frame work (Felder and Brent, 2007)

Cooperative Learning Elements	Applying to Facebook Activities
Positive interdependence	The group members shared individual information for group on Facebook. They are obliged to rely on one another to achieve the goal. If any team members fail to do their part, everyone suffers consequences.
Individual accountability	Three or four students in a group are held accountable for doing their share of the work and for mastery of all of the material to be learned.
Face-to-face promotive interaction	The group members discussed and exchange idea about assignment via Facebook. Although some of the group work may be parcelled out and done individually, some must be done interactively, with group members providing one another with feedback, challenging reasoning and conclusions, and perhaps most importantly, teaching and encouraging one another.
Appropriate use of collaborative skills	The group members are encouraged and helped to develop and practice trust-building, leadership, decision-making, communication, and conflict management skills.
Group processing	The group members set group goals, periodically assess what they are doing well as a team, and identify changes they will make to function more effectively for preparing the presentation.

Consequently, in this study, we used the Facebook in order to support students' learning with the process of cooperation on the social network. The experimental design was conducted with university students who learned the development of computer multimedia instruction course to investigate the following research questions:

1. How can we explain the differences between a traditional group and a Facebook cooperative learning group?
2. What are students' attitudes towards Facebook cooperative learning?

2. Methodology

2.1 Participants

In this study, we recruited 59 students who were the pre-service teachers in vocational education of the university in central of Thailand. Participants were divided into two groups consisting of 31 students in experimental group learned with cooperative learning via social network site, while the 28 students in the control group learned with traditional face-to-face group in the classroom.

2.2 Procedure

Prior to the experiment, the students in both groups took the pre-test. After that, the students in experimental group participated a group on the Facebook, then they were separated into 7 teams by topic of individual interest. The group members learned contents of the development of computer multimedia instruction course while instructor gave the guidelines appropriate for the condition to which they had been assigned, everyone in the group was received the different task for project construction consisting of the searching information, design the instruction, animating media, selecting sound effect within cooperated by discussion on Facebook (as shown in Figure 1) while the students in control group learned regular content and group discussion in the classroom. Both groups were conducted over a period of approximately 14 weeks. After that, they took the post-test and interviewed. While students are learning, a teacher's role is to facilitate a Facebook collaborative group to reach the topic's goal.

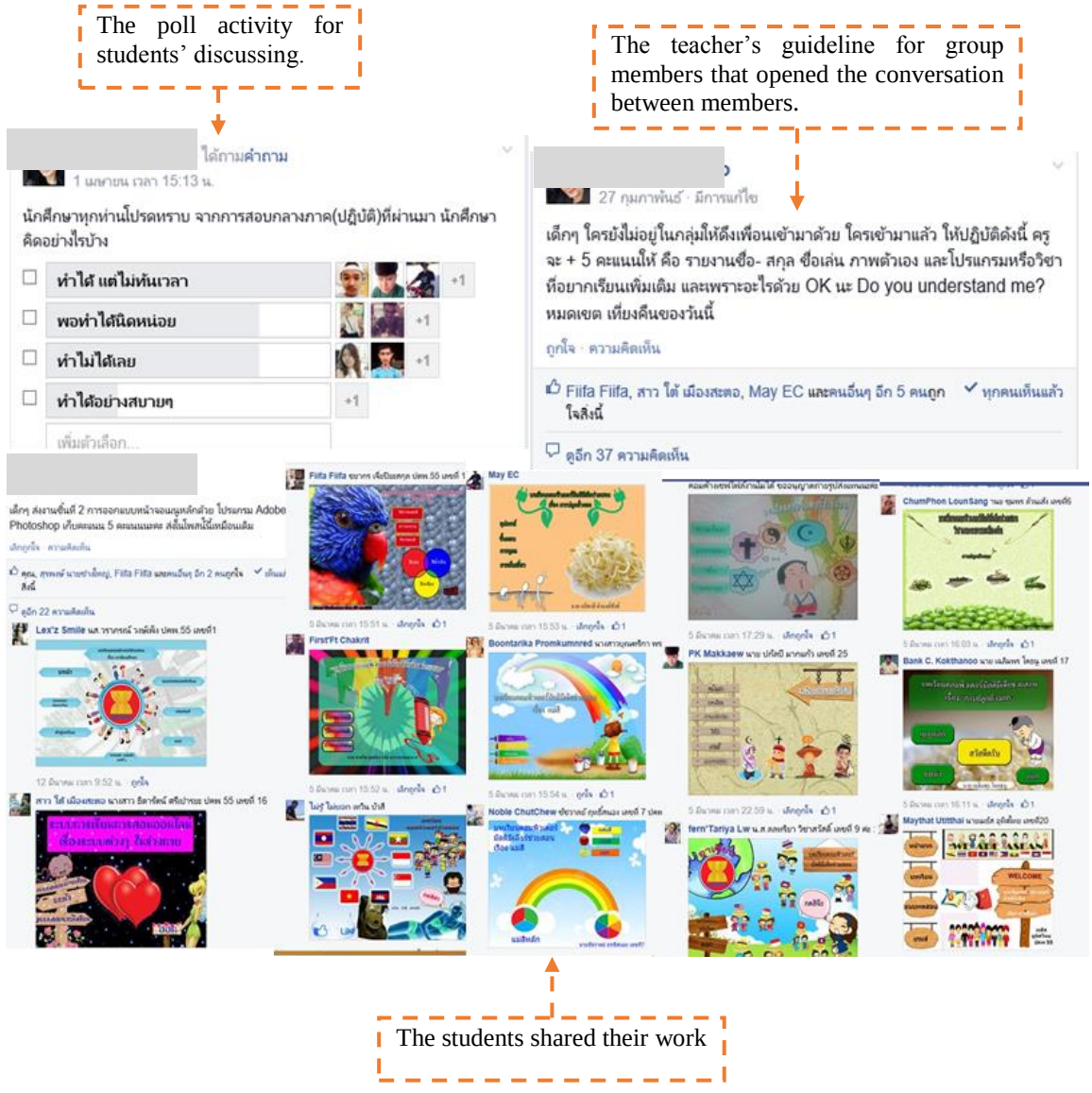

Figure 1. Illustrative examples of learning activities on Facebook

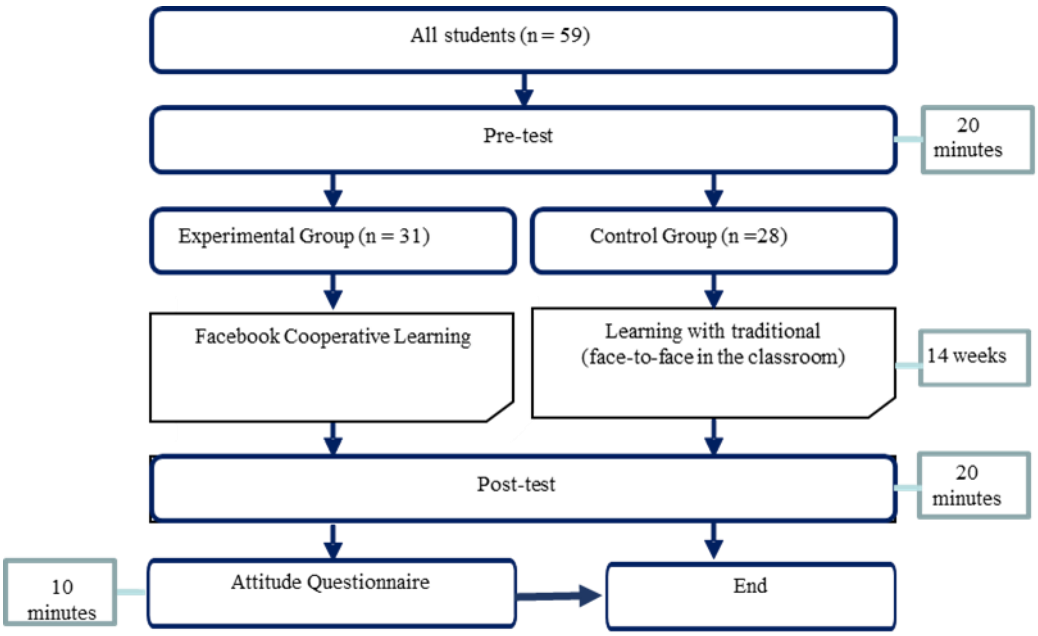

Figure 2. Experiment procedure

3. Research Results

In this study, the pre-test and post-test questionnaire consisted of 20 multiple-choice items. The KR-20 value shows that the reliability of this test was 0.74, indicating that it is reliable. Table 2 shows the *t*-test results of the mean scores and standard deviations of the pre-test scores of students in experimental group (EG) was 11.03, (SD = 2.01), and control group CG was 11.10, (SD = 1.90) respectively. It is found that the test scores of the EG and CG did not significantly differ with t = 2.000 and p value > 0.05, indicating that the two groups of students had equivalent prior knowledge.

Groups	N	Mean (S.D)	*T*-value	*P*-value
EG	31	11.03 (2.01)	2.000	.880
CG	29	11.10 (1.90)		

Table 2. T-test results of the conceptual pre-test for the two groups of students

Table 3 shows that the EG achieved significantly better performance than the CG with t =2.001 and p value < 0.05, implying that the learning achievement of the EG was greater than that of the CG. We have found that two groups of students had equivalent prior knowledge before participating in the learning activity. After finishing the learning activity, the post-test scores of experimental group was 23.57, (SD = 2.42), and control group was 20.90, (SD = 2.98), respectively.

Table 3. T-test results of the conceptual post-test for the two groups of students

Groups	N	Mean (S.D)	*T*-value	*P*-value
EG	31	23.57 (2.42)	2.001	.000*
CG	29	20.90 (2.98)		

* $p < .05$

The questionnaire was administered to investigate the students' satisfaction after participating in the learning activities on Facebook. There was employed a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree". This questionnaire consisted of ten items divided into four

dimensions. The result (as shown in Table 4) show that the students strongly agree in all dimensions: behavioral intention (M=4.85, SD=0.35) , perceived satisfaction (M=4.81, SD=0.40) , interactive learning activities (M=4.77, SD=0.41) and perceived usefulness: (M=4.74, SD=0.44).

Table 4. The students' satisfaction Cooperate learning on Facebook

Questionnaire items	Mean	SD	Remark
Perceived satisfaction:	***4.81***	***0.40***	***strongly agree***
1. I am satisfied with using cooperative learning on Facebook as a learning assisted tool.	4.81	0.40	strongly agree
2. I am satisfied learning Facebook functions.	4.70	0.44	strongly agree
3. I am satisfied with the learning contents in cooperative learning on Facebook.	4.87	0.34	strongly agree
Interactive learning activities:	***4.77***	***0.42***	***strongly agree***
1. I would like to share my contents in using cooperative learning on Facebook experience.	4.71	0.45	strongly agree
2. I believe using cooperative learning on Facebook can assist teacher-student-student interaction.	4.84	0.37	strongly agree
Behavioral intention:	***4.85***	***0.35***	***strongly agree***
1. I intend to use cooperative learning on Facebook to assist my learning.	4.81	0.40	strongly agree
2. I intend to use Cooperative learning on Facebook as an autonomous learning tool.	4.90	0.30	strongly agree
Perceived usefulness:	***4.74***	***0.44***	***strongly agree***
1. I believe using cooperative learning on Facebook is a useful learning tool.	4.71	0.45	strongly agree
2. I believe the contents in cooperative learning on Facebook are useful.	4.77	0.42	strongly agree

Moreover, when we asked the participating students to report their own attitudes toward the Facebook cooperative leaning, we found that they had positive attitude as follows:

Students A: *"I like learning on Facebook because I can send my work and group work anytime and we can easily discuss our topic".*
Students B*: "Easy to connect with my friends and my teacher, only post on Facebook then someone had an answer or idea".*
Students C: *"It's convenient to support our requirement such as we want to discuss in my team or exchange idea or share information".*
Students D: *"Facebook is part of my team work, it is the way to learning together in my team".*

4. Conclusion

This paper presented the results of the proposed approach that students in the development of computer multimedia instruction course saw the use of Facebook as a positive. To evaluate the performance of this online cooperative learning, 31 pre-service teachers were recruited to participate in this study. We found that the online cooperative learning could help students' learning achievement and they had positive attitude toward learning in this online cooperative learning environment. Likewise, Ainin et al. (2015) accepted influences Facebook usage on students' academic performance In addition, Chang and Lee (2013) investigated Facebook community influences the development of students.

The success of this study, we summarized that it is an important role in enhancing the effectiveness of the online cooperative learning with using Facebook.

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