Feasibility study of using social networks platform for learning support: an example of Facebook

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Abstract: In this study, we explored the students' computer-supported collaborative learning behavior based on the Facebook platform. Sixty two senior college students major in Information Management took Decision Support System (DSS) class. Besides the lectures and class discussion, the students participated in the DSS Facebook for collaborative learning. We found that students' characteristics (e.g., gender and mindset of learning) are important factors to affect their Facebook usage behavior and learning performance. The students using DSS Facebook more often get better performance in their final projects, learning satisfaction and the online communication behavior survey. We also found that gender affects the usage of social networks platform. For instance, male students use social networks platform several times per week and get better performance in online communication, learning satisfaction and creativity self-efficacy.

Keywords: Social Networks Platform, Computer-supported Collaborative Learning, Learning Satisfaction

Introduction

The concept of E-learning was raised by Jay Cross in 1999. In 2006, the E-learning 2.0 concept was maturing as anyone could use the information technology (or search engine) to enhance his/her learning efficacy. With the mobile device becoming more popular and the network transmission speed getting faster, we can search and learn valuable knowledge easily anywhere. Even more, students can take the distance learning class in the comfort of their homes. However, previous studies found that the efficacy of e-learning is very limited. This is because the teacher's expectations are unclear, communication lacking, user interface been poor coupled with slow access speed [1-4].

The social networks platforms such as Facebook, plurk, and twitter provide space where users with same interests can gather together and interact. These networks platforms provide faster access speed in both synchronous and asynchronous communication methods [5]. Especially, Facebook provided friendly interface platforms where users interact conveniently. User can share information from other websites and get the latest news immediately as well [6].

In this study, we explored the feasibility of using social networks platform as learning support tool. What kinds of student characteristics can affect their usage behavior? Can social networks platform like Facebook be an effective learning support tool?

1. Materials and Literature Review

1.1 Computer-supported collaborative learning (CSCL)

The collaborating learning is a form of learner and learner interaction. When first used in the industry to promote the productivity in 1930s, collaborative learning has been considered as an effective instructional method in both traditional and distance learning. Based on the Internet and powerful computing techniques, computer-supported collaborative learning can shorten the learning time and the venues. It can enable learning and communicating taking place synchronously or asynchronously. People from different fields can raise different viewpoints through the collaborative learning process as well. Learners can also contribute and share their knowledge [7]. However, several differences can be identified as existing between E-learning and the computer-supported collaborating learning. Although instructors can upload digital teaching materials in an E-learning environment, lacking of face-to-face communication can reduce the students' participation. The digital teaching materials must refresh frequently in E-learning; therefore, the instructors should pay greater attention to update their teaching website. On the other hand, a computer-supported collaborative learning should focus on interactive process, active learning and knowledge sharing. The learning style can be diversified in computer-supported collaborative learning, for example, people communicate face-to-face or at distance, in both synchronously or asynchronously. [7-9].

1.2 Social Networks Platform (Facebook)

Facebook was started by several college students from Harvard in 2004. Until today, Facebook has generated over 800 million users from all over the world. As a community networks platform, users can register by simply entering e-mail, nickname or real name, date of birth, working place and interest. Users also can easily create their own webpage, and interact with other Facebook user counterparts.

When used as a learning support platform, Facebook provides diversity discussion tools for user. It reminds user when a new message is received. Facebook provides synchronous and asynchronous communication functions in graffiti wall. Even more, Facebook provides users with friendly interfaces as well. In Taiwan alone, more than 10 million people use Facebook. The experience of using Facebook tools increases the feasibility in ones usage of Facebook for learning purpose. However, The entertainment application becomes an obstacle while students take Facebook as a learning tool[10]. Compare to traditional learning, like blackboard or PowerPoint slide, students seldom raise their hands to ask questions, most of all, lack interaction in class. In this study, we used Facebook as a learning support tool by taking the advantages of its strength, despite its original social networking purpose.

1.3 Learning performance

The learning performance is the result of a student taking a course or the learning activities. In this study, besides the project scores, we use questionnaire to evaluate the learning performance.

1.3.1 Online communication

Conrath and Zeccola [10] tried to analyze the effect of computer mediated communication (CMC) on student learning, and founded that CMC can provide both positive and negative

learning effects on students. For the positive effects, they believe that CMC can help students to get more learning opportunities. For example, education-based Social Networking Sites (SNSs) can be regarded as an effective technological tool for enhancing the quality of learning for students who are in higher level education courses (tertiary educations)

1.3.2 Learning Satisfaction

The previous studies investigated the relationships between various variables of students, including prior computer experience, gender, age, scholastic aptitude, learning styles, and learning experience from a Web-based course. The result showed that most of the students prefer to earn the learning experiences from a Web-based course. Moreover, the effect of learning performance from the Web-based course is almost the same as the face-to-face version [11-13] .

1.3.3 Creativity Self-efficacy

Bandura and Cervone [14] regarded self-efficacy as an important condition for creative productivity and the discovery of new knowledge. For instance, in measuring the effect of personal creative behaviors, they considered self-efficacy as a critical component in their model. Creative self-efficacy appears to provide such momentum in that strong efficacy is believed to enhance the persistence level and the coping efforts individuals will demonstrate when encountering challenging situation. Ford (1996) bring forward self-efficacy as a key motivational component in individual action, and those who have low sense of self-efficacy may be easily discouraged by failure in progress[16].

2. Research design

There are totally 62 students taking Decision Support System(DSS) course. This is a required course for senior college students major in Information Management. The experiment lasts for two months, starting from the mid-term exam to the end of the semester. The students were separated into 12 groups. Each group was constituted of 5~6 members. The group projects' tasks were to determine a decision problem by students themselves and to construct a prototype of DSS for each group of students. Each group has to define their own topics. It needs group member discussion and brainstorming. We applied Facebook to support the students' group projects. The following items were what student used: (a) Graffiti wall: To post articles or ask a question online. (b) Discussion boards: Each group has its own discussion board. (c) Document uploaded: A tool that student can upload articles or news. (d) Great/Good: One of the participant counters. And (e) Response: After the students read one article, they can give their feedbacks.

2.1 Research framework

In this study, the research framework contains three major entities: student properties, use of Facebook and learning performance. When exploring the relationship between student properties and use of Facebook, we use gender, class attendance and the scores of midterm exam and relation to their Facebook usage behavior like contribution and the frequency of use per week. The relationship between student properties and learning performance is investigated by using the questionnaire of online communication, learning satisfaction and

creativity self-efficacy. Finally, we studied the relationship between the use of Facebook frequency and the learning performance. The research questions are proposed as follows:

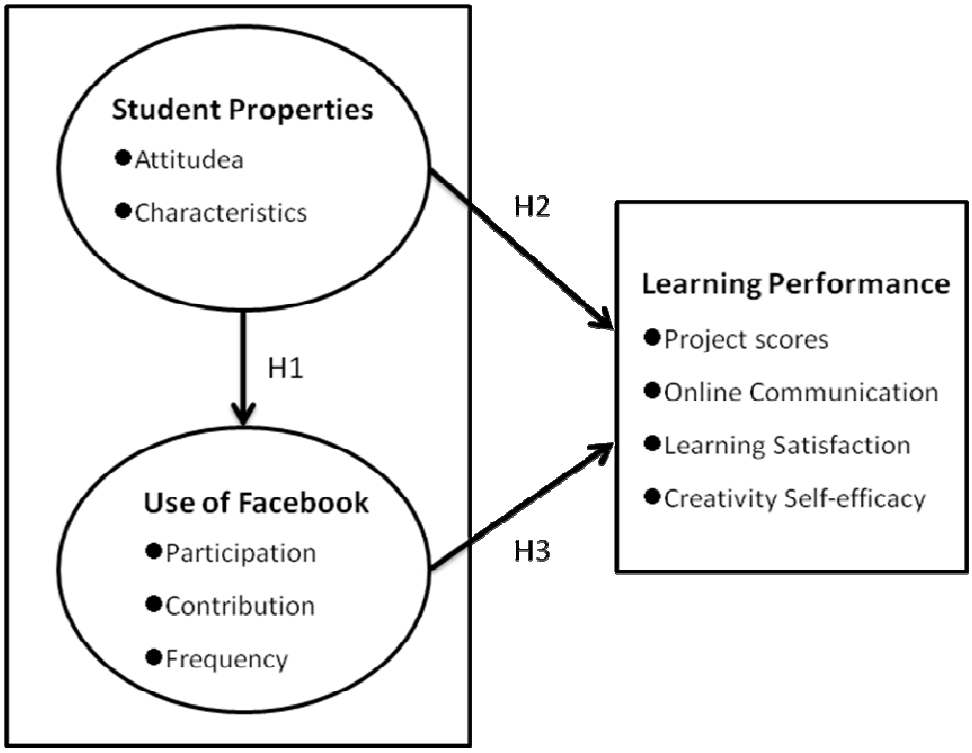

Figure1. Research Framework

1. **What is the relationship between students' properties and the use of Facebook? Who are the heavy users?**
   We try to find the factors (the student properties include gender, the time spend on the internet, the academic learning attitude) which affect the usage of Facebook participation, contribution and what make students use Facebook heavily.

2. **What is the relationship between students' properties and the learning performance? Does using of Facebook play the mediating role?**
   We try to find the factors which affect the learning performance, as well as the final project performance, online communication, learning satisfaction and creativity self-efficacy. However, in this stage, the senior students may change their focus into the job interview or study hard for master program entrance exams that treat the DSS final project grade not so seriously. The previous study showed that learning attitude affects the learning satisfaction and the online communication.

3. **What is the relationship between usage of Facebook and learning performance?**
   Facebook was applied as a discussion platform for the group project. Students can use the tools and share the knowledge immediately. During the process, we recorded both the frequency of usage of Facebook and the content. The students' participation and contribution were evaluated by other peer group members to avoid bias.

2.2 Questionnaire design

The questionnaire was designed in four parts: basic personal information, online communication behavior, learning satisfaction and creativity self-efficacy.

The personal information includes gender, daily using internet hours, actual use of Facebook (hours) and frequency of online discussion.

Online Communication Behavior

- The online communication survey questionnaire was adopted from the Wang's CMC discussion model (2011) [15]. Five positive questions and five negative ones of a 5-point Likert scale. The reliability is 0.82 for positive questions and 0.72 for negative ones. In this study, we use the positive parts because of their higher reliability.

Learning Satisfaction

- The learning satisfaction questionnaire was adopted from Gunawardena and Zittle's study (1997) [2]. The reliability for ten-question construct is 0.86.

Creativity Self-efficacy

- The creativity self-efficacy was adopted from the Tierney and Farmer's study (2002) [16]. The reliability for twelve-question construct is 0.88

3. Results

In the research question 1: What are the relationship between the student properties (learning attitude and gender) and the use of Facebook (participation, contribution and the frequency of using Facebook)? The active student means the student attending discussion more often and getting higher midterm exam score. In this study, we try to figure out the difference between active students and non-active ones until the end of final project.

As in Table 1, the active students get higher participation scores than the non-active students significantly ($p < 0.05$). Regarding gender differences, the male students use Facebook more often than the female ones ($p < 0.05$). The following items were used to evaluate the student learning attitude: Attendance: 20%, Individual homework: 20%, Midterm exam: 60%, Ask questions & Presentation 10% (Extra points). Those scores lower than 60 were defined as non-active. Totally 34 students (17 male and 17 female) were non-active. Those scores higher than 60 were defined as active. Totally 28 students (21 male and 7 female) were active.

Table 1. The student properties and the use of Facebook

Variables	non active n = 28	Active n = 34	t value	p value
Participation	4.20	4.48	-2.206	0.031*
Contribution	4.17	4.46	-1.979	0.052
Weekly use hours	3.11	3.09	0.019	0.985
Variables	**Female n = 24**	**Male n = 38**	**t value**	**p value**
Participation	4.63	4.45	1.523	0.133
Contribution	4.59	4.32	1.978	0.053
Weekly use hours	1.90	3.86	-2.421	0.019*

Research question 2: What are the relationships between the student properties (learning attitude and gender) and the learning performance (project scores, online communication, learning satisfaction and creativity self-efficacy)?

Table 2 shows the relation between learning attitude and creativity self-efficacy ($p < 0.05$). For the college students, measuring their learning attitude by their class performance could be insignificant. This is because the learning performance can be affected by group members or the characteristics. And the small sample size also causes the insignificant situation. Member from the same group gets the same scores. Table 1 shows the male students spend more time in online discussion. And in Table 2, the male students get higher scores in creativity self-efficacy significantly ($p < 0.05$).

Table 2. The student properties and the learning result

Variables	non active n = 28	Ative n = 34	t value	p value
Project scores	85.36	84.18	0.994	0.324
Online communication	20.25	19.65	1.030	0.307
Learning satisfaction	40.68	39.29	1.277	0.207
Creativity self-efficacy	40.25	37.62	2.017	0.048*
Variables	**Female n = 24**	**Male n = 38**	**t value**	**p value**
Project scores	85.33	84.32	0.762	0.451
Online communication	19.21	20.37	-1.968	0.054
Learning satisfaction	38.63	40.74	-1.939	0.057
Creativity self-efficacy	37.08	39.89	-2.115	0.039*

Research question 3: What are the relationships between use of Facebook (participation, contribution and the frequency use Facebook) and the learning performance (project scores, online communication, learning satisfaction and creativity self-efficacy)?

In the Table 3, the student who had been posting and responding gets higher project scores (83.95, 86.09). Those who discuss twice a week also get higher in project scores (83.59, 85.87), online communication (19.38, 20.39) and leaning satisfaction significantly ($p < 0.05$). The result shows that student use online discussion frequently can help them get better learning performance, especially in the learning satisfaction.

Table 3. The usage of Facebook and the learning performance

Variables	Non post/resp n = 40	Post/ response n = 22	t value	p value
Project scores	83.95	86.09	-1.763	0.083
Online communication	19.90	19.95	-0.88	0.930
Learning satisfaction	40.20	39.41	0.695	0.490
Creativity self-efficacy	38.90	38.64	0.188	0.852
Variables	**dicussion < 2 n = 29**	**dicussion > 2 n = 33**	**t value**	**p value**
Project scores	83.59	85.87	1.815	0.074
Online communication	19.38	20.39	1.752	0.085

Learning satisfaction	38.52	41.15	0.528	0.014*
Creativity self-efficacy	39.79	39.70	1.440	0.155

Table 4 shows that the relation between participation, contribution and discussion times are highly significant. The contribution and project scores show no correlation with other variables. Online communication, learning satisfaction and creativity self-efficacy were highly correlated.

Table 4. The relation between usage of Facebook and the learning result

	Participation	Contribution	Discussion times	Project scores	Online communication	Learning satisfaction	Creativity self-efficacy
Participation	1						
Contribution	0.755***	1					
Discussion times	0.356**	0.151	1				
Project scores	0.099	0.175	0.183	1			
Online communication	-0.120	-0.116	0.239*	0.109	1		
Learning satisfaction	-0.153	-0.213	0.314*	0.195	0.681***	1	
Creativity self-efficacy	-0.111	-0.083	0.148	0.084	0.516***	0.546***	1

*means p value < 0.05 ** means p value < 0.01 *** means p value < 0.001

4. Discussion

In this study, we explored the relationship between the student properties, the use of Facebook and the learning performance. We found that the male students spent much time in online discussion, they get higher online communication, learning satisfaction and the creativity self-efficacy. The female students however have higher participation and higher contribution than their male counterparts. And the female students also get higher final project scores.

The online communication provides chances for information and the learning material exchange. Students can get more information in social networks platform than when they search by themselves. As a learning support purpose, the instructor needs to pay keen attention on the platform management and keep the students follow the latest news. In this study, it is observed that students get a good experience when they use DSS Facebook. Their frequencies of use of Facebook are also important factors here. Students discussing frequently enable themselves to gain higher final project scores, online communication and learning satisfaction.

5. Future Development

In the future, we would increase the sample size as well as including different types of courses. While heterogeneity group affects the learning performance, we intend to design an experiment to investigate this phenomenon. The usage experience of Facebook as learning support tool can provide feedback for development of new platform for collaborative learning.

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