PERCEIVED LEARNING CONSTRUCTS AND INTERACTION PATTERNS IN A SOCIAL NETWORKING SITE

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ABSTRACT. This article reports on results of a study perceived learning constructs in a Social Networking Site (SNS) based on a two-round data collection from undergraduate Computer Science Education (CSE) studies. The first phase involved distribution of questionnaires to a total of 219 undergraduate students ranging from non-engineering (n=80) to engineering (n=139) that resulted in identification of three measured learning constructs: Social Bonding, Social Bridging and Social Intention. In phase two, evaluation of students' learning transcripts in SNS were performed. Results identify 22 interaction patterns which then are further grouped into four learning dimensions of Participative, Interactive, Social and Cognitive. The findings indicated support for social connectivism, which promotes knowledge being distributed across a network of connections for each group of students.

Keywords: Social Networking Site, Interaction Patterns, Learning Environment

INTRODUCTION

In Malaysia, Facebook has been reported as the most visited site and contributes to one-third of the web traffic in Malaysia (Kevin & Nicholas, 2013). Studies showed that 82% of Facebook users use Facebook on a daily basis (Hussain, 2012). A study conducted by Ellison et al. (2007) reported that students spent an average of 10-30 minutes daily on Facebook. Another study, conducted by Towner and Muñoz (2010) also reported similar findings, where 22% of the students spent 10-30 minutes on Facebook. Although Facebook is not specifically designed for educational use, there are several features of Facebook site that resemble traditional learning management systems (i.e. Facebook post, comment, like and share, chatting, and file upload). Facebook group also offers several features that can be used in learning and teaching. It enables both learners and instructors to post announcements, photos and videos. With all posts automatically appearing on the Facebook group wall it is easier to keep track of all activities within the group. Other than that, event functions can also be used to organize face-to-face class meetings (Wang, Woo, Quek, Yang & Liu, 2012).

RESEARCH QUESTION

Specific goals of this study were to address the following research question:

- What are perceived learning constructs and interaction patterns learning via Facebook?

In the following sections, we first review the relevant literature followed by a description of study methods and analysis of results. Implications of study findings are also discussed.

LITERATURE REVIEW

Past research has shown the engagement of students in social networking sites, especially Facebook. In the context of education, Facebook has been seen to have high potential for student's interaction, collaboration, information and resource sharing (Said & Tahir, 2013). The use of Facebook as a learning environment proved to be beneficial for students. Facebook was viewed as having the ability to promote interaction beyond the boundary of the classroom. Bosch (2009) found lecturers could contact students quicker and easier via Facebook compared to normal classroom contact, and students felt more comfortable asking questions via Facebook. Additionally, students also felt that their lecturers were more approachable in the classroom after following them online via Facebook (Bosch, 2009; Duffy, 2011).

Research suggested that Facebook could support peer interaction, increased communication about course content, and assessments. For example, Selwyn (2009) indicated that students used Facebook to discuss their learning experiences and events as well as exchange information for assessment requirements. Peer interaction via Facebook can be a valuable learning method, due to the fact that students learn more by interacting and communicating with other students (Said, Tahir & Ali, 2014). A study by Mazman and Usluel (2010) examined three dimensions of Facebook, namely: communication, collaboration, and resource or material sharing. Results of the study found that Facebook adoption as learning tool has a significant positive relationship with usefulness, ease of use, social influence, facilitating conditions and community identity. The study also indicated that usefulness was determined as the crucial factor in the adoption of Facebook as learning tool.

The potential of Facebook for educational purposes has been reported by many researchers. Towner and Muñoz (2010) reported that college students used Facebook for both formal and informal learning. They also found that 56% of students leave a message on other students' wall about class, 43% talk about class through Facebook chat, and 38% talk about lectures. Additionally, the study also indicated that 47% of students helped other students with required materials for their coursework via Facebook, and the study concluded that Facebook is an ideal medium for learning, supporting interactions between peers and conversations about course material. With the students as well as teachers increasingly using Facebook, the objective of this research was to find out students' perceptions of learning via Facebook as a chosen SNS, and its implication as a learning tool.

METHODOLOGY

This study was conducted in two phases.

The first phase consisted of distribution of questionnaires to undergraduate students to gather data concerning the constructs that were important to learning CSE via SNS. Data from Facebook (as selected SNS) was collected through questionnaires. The choice of respondents from engineering and non-engineering were based on students' enrolment in the course. A self-developed questionnaire with 30 items was used to measure three major constructs of interest, i.e. social bonding, social bridging and intention to use, on a 5-point Likert scale. A five-point Likert scale ranging from 'strongly agree' to 'strongly disagree' was employed as it has been most recommended by the researchers that it would reduce the frustration level of respondents and increase response rate and response quality (Sachdev & Verma, 2004). In phase two, four Facebook groups were created for the purposes of collecting students' interaction patterns with their peers and instructors. All students' interactions in four Facebook groups were then analyzed using content analysis in order to reveal their interaction pattern in Facebook. The evaluation of students' learning transcripts in Facebook resulted in identification of 22 interaction patterns based on four learning dimensions of Participative, Interactive, Social and Cognitive.

DATA ANALYSIS

Data obtained from 219 students were analyzed using principal components analysis (PCA) with varimax rotation to identify the underlying factors of the perceived learning constructs. PCA with varimax rotation was applied on the data to reduce the number of items in the questionnaire down to their principal components, which in this study would be social bonding, social bridging and social intention. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .713, indicating that the sample size relative to the number of questionnaire items was adequate for applying PCA. The Bartlett's test of sphericity was statistically significant (χ^2= 3474.248, p = .000), and indicated that the overall correlations within the correlation matrix were adequate. In summary, these results showed the factorability of the data, hence justifying the use of PCA in the study.

Preliminary results of the PCA indicated that a few items cross-loaded in the pattern matrix table; thus the factor solution could not be accepted. In order to ensure that the issue was solved, some procedures were followed to ratify the problematic items. Firstly, after referring to the communalities table, six items were discovered to be below 0.5 and five items cross-loaded in the pattern matrix while another five items were discovered to be problematic were removed sequentially to get results. After PCA, five items were retained as valid and reliable for Social Bonding, four items for Social Bridging, and five items for Social Intention. Table 1 shows the final factors with their respective items.

Table 1.Finalized Items

Constructs	Item statement	Loading
Social Bonding	Facebook helped me to share ideas or communicate.	.747
	I like participating and sharing my ideas in Facebook discussions.	.732
	Facebook provided me an easy way to get additional information for my assignment from my friends.	.717
	I feel Facebook is an effective tool for learning.	.663
	I can connect with lecturer and other students outside the classroom at anytime and anywhere via Facebook.	.640
Social Bridging	I use Facebook to learn more about other people in my class.	.736
	I feel Facebook is suitable for networking.	.713
	Interacting within Facebook was easier than I thought.	.685
	I feel sensitive with my friends' updates in Facebook.	.674
Social Intention	I feel out of touch when I haven't logged onto Facebook for a while.	.739
	Facebook is a part of my daily routine.	.734
	I feel I am part of the Facebook community.	.667
	I use Facebook to get attention that I need from my friends.	.662
	I am proud to tell people I'm on Facebook.	.623

FINDINGS

To find out demographics and general use of Facebook, 219 students of Universiti Teknologi Malaysia (UTM) were randomly selected. Of the 219 students, 150 (68%) were engineering students and 69 (32%) were non-engineering students. 111 (51%) of them were

male and 108 (49%) were female. The majority of the respondents were between the ages of 19 and 23 (66%). 42 (19%) respondents aged in the range 24-30, 29 (13%) were in the age range 31 years and above, and 2 (1%) were under 19 years old. Another 1 (1%) were identified as unknown age because he/she did not answer the age question in the questionnaire. Most of the students are Malay (163, 74%) followed by Chinese (35, 16%), Indian (16, 7%) and other (5, 3%).

Other than the demographic data, questions about student spending time on the internet and on Facebook were also asked. The result reveals that the majority of students spend more than 3 hours using the internet (98, 45%), followed by 2-3 hours (66, 30%), 1-2 hours (44, 20%), 31-60 minutes (8, 4%), and 10-30 minutes (3, 1%), on a daily basis. From the collected data, it was found that the majority, 34 (40%), of the respondents have 500-999 Facebook friends, followed by 38 (17%) respondents with 301-499 Facebook friends, 34 (16%) respondents with more than 1000 Facebook friends, 29 (13%) respondents have 201-300 Facebook friends, 19 (9%) respondents have 101-200 Facebook friends and another 11 (5%) of the respondents have 'other' total number of Facebook friends.

Additionally, an item from the questionnaire was used to investigate the types of content that students shared on Facebook. The results show that the types of content students shared the most was motivational or spiritual quotations with 118 votes, followed by news and current affairs with 96 votes, academic content with 82 votes, photos with 75 votes, personal opinion with 71 votes, moods and emotion with 58 votes, idle talk with 42 votes and 'other' type of content shared with 3 votes. A further independent t-test was conducted to seek any statistically significant mean difference between engineering and non-engineering.

Social Bonding

Social bonding is the binding tie or the bonding between a person with their family, friends, and people surrounding them. Social bonding usually occurs within groups or community where the people in the group interact with each other. In this research, social bonding was used to examine the relationship bonding between students and their peers when interacting via Facebook. There was significant difference in the scores for engineering students (M = 2.56, SD = 0.44) and non-engineering students (M = 2.73, SD = 0.37); t (214) = -2.71, p=0.007. The result suggests that there is a difference between engineering students and non-engineering students in terms of social bonding while using Facebook.

Social Bridging

This construct refers to the interaction between different groups or communities. This research was to see if there was social bridging between students and other groups or communities inside Facebook, and also to find out whether there was a difference between engineering and non-engineering students. There was no significant difference in the scores for engineering students (M = 2.48, SD = 0.51) and non-engineering students (M = 2.60, SD = 0.44); t (216) = -1.70, p=0.091. This result suggests that there is no difference between engineering students and non-engineering students in terms of Social Bridging while using Facebook.

Social Intention

This construct was used to determine the social activities that were carried out by students through Facebook. The activities include academics, news and current affairs, personal opinions, and motivational quotations (Table 4). There was no significant difference in the scores for engineering students (M = 2.93, SD = 0.42) and non-engineering students (M = 2.90, SD = 0.41); t (216) = 0.486, p=0.63. This result suggests that there is no difference between engineering students and non-engineering students in term of sharing their social activities while using Facebook.

Interaction Patterns through Facebook

Four Facebook groups were created for the purposes of collecting students' interaction patterns with their peers and instructors. All students' interactions in Facebook group were then analyzed using content analysis in order to reveal their interaction pattern in Facebook. To investigate students' interaction patterns in Facebook, four learning dimensional patterns were used. Results from participative dimension showed that FB group 3 is the high level participation group with a high number of postings and viewings, while FB group 1 and group 2 are the active groups with a high number of postings but low number of viewings. The FB group 4 was considered as low participation because the number of postings and viewings made by students was low. The most social cues made by students were the emoticon icons and the least were concern and encouragement. Students from FB group 2 made the highest number of social cues while interacting via Facebook. Additionally, the highest interaction made by students in cooperative theme is providing information, and the least interaction is suggesting new ideas. Overall result also showed that students are mostly clarifying the issues or tasks given in the Facebook group.

DISCUSSIONS

The demographics finding shows that most students spend more than three hours per day surfing the internet. In addition, it was also found that the majority of the students spend 1-2 hours a day on Facebook. These findings are similar to the findings of research conducted by Mustaffa et al. (2011) who found that Malaysian youth spend 1-3 hours a day on Facebook. In investigating the perceived learning constructs of using Facebook as a learning tool, three constructs were identified, namely: social bonding, social bridging and social intention. A series of independent t-tests were also conducted to find out whether there was any statistical difference between engineering students and non-engineering students' perceptions of using Facebook in teaching and learning.

The first and second constructs were used to examine whether social bonding and bridging were perceived by students within the Facebook environment. Results show that there was a significant difference between engineering and non-engineering students in terms of social bonding activities within Facebook. However, no significant difference was found for social bridging. This shows that students perceived the use of Facebook as a medium to get updates from their friends. This finding is consistent with several other studies that reported students' primary motive of using Facebook was to maintain existing relationships and to keep in touch with their old friends (Elisson et al., 2007; Yahaya et al., 2013; Wang et al., 2012).

The social intention construct shows no significant difference between engineering and non-engineering students. The findings indicated that students perceived Facebook as a place where they could easily share their ideas with their friends on Facebook. The construct also shows that there was no significant difference between engineering and non-engineering students in terms of how students perceived the use of Facebook as a communication medium to stay in touch with their friends and lecturers by sharing their social activities.

Finally, the Facebook interaction patterns show that FB group 3 students had high participation and interaction leading to learning, but were average in social and cognitive aspects. On the other hand, FB group 2 students showed an active participation, with high reciprocal interaction and high social cues, but average for cognitive aspect. In a similar vein, the FB group 1 students showed an active participation and high reciprocal interactions, with average social and low cognitive aspects. As for the FB group 4 students, they showed low in all aspects (participation, interaction, social and cognitive) to learning in Facebook.

Conclusion

This research has revealed several findings on students' perceptions of using Facebook as a learning tool and their interaction patterns while learning via Facebook. This study found that students had positive perceptions towards the use of Facebook in learning, which they used to interact with their friends, and at the same time, informally engaged for academic purposes. The research also revealed students' interaction patterns based on selected dimensions (participative, interactive, social and cognitive). The findings indicated support for social connectivism, which promotes knowledge being distributed across a network of connections for each group of students.

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