

Students' Perceived Factors of Learning Computer Science Education through a Social Networking Site

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Abstract

Despite the increasing popularity of social networking sites (SNS) due to a major involvement of students in online social activities, there is a significant challenge involved in using SNS, particularly as a learning platform in teaching computer science education (CSE) to undergraduate students in non-engineering and engineering studies. To find out the perceived factors of learning through SNS approaches, questionnaires were distributed to a total of 219 undergraduate students ranging from non-engineering (n=80) to engineering (n=139). From the questionnaire, five constructs were identified as: sharing perspective, communicative process, cohesiveness expression, peer interaction, and tools and resources. The evaluation of students' learning transcripts in SNS indicated teaching CSE through SNS enhanced students' understanding of CSE. The study is shown to support social constructivism, which promotes knowledge that is distributed across a network of connections.

Keywords. Social Networking Site; Facebook; Computer Science Education

Introduction

In this modern day, our life activities are closely related to technology, from the simplest and low-tech to the latest and high-tech. Technologies such as television, radio, and computer are among common technologies. These technologies are not only for entertainment but also as a means of obtaining information for learning and teaching [9]. With the widening coverage of internet in schools and universities, there are many tools and applications which have emerged. Among of them is Web 2.0. The term Web 2.0 was first introduced in 2004, in which the user has the opportunity to 'read and write' a dynamic website (i.e. blogs, wikis, podcast) [9]. Web 2.0 also has the characteristic of being socially personalized, interactive and participatory (i.e. social networking sites) [1][8][9]. Of all the Web 2.0 components, particularly social networking sites, Facebook is the most popular. Statistics Brain [11] reported that Facebook is ranked second out of the top five most visited sites on the internet after Google.com. The statistics indicated that Facebook is also the most frequently visited social network site compared to other social network sites such as YouTube, Twitter or MySpace. Table I shows some statistics as reported by Statistics Brain [11] as of 5th November 2014.

TABLE I
FACEBOOK STATISTIC BY STATISTICS BRAIN [11]

Facebook Statistics	Data
Total number of monthly active Facebook users	1,310,000,000
Total number of mobile Facebook users	680,000,000
Percentage of all Facebook users who log on in any given day	48%
Average time spent on Facebook per visit	18 minutes
Average number of Facebook friends per user	130
Links shared every 20 minutes	1 million

Research Background

In Malaysia, Facebook has been reported as the most visited site and contributes to one-third of the web traffic in Malaysia [5][11]. Spending time on Facebook seems to have become a daily routine with Malaysian users, especially Malaysian youth. Studies showed that 82% of Facebook users use Facebook on a daily basis [4]. A study conducted by Ellison et al. [3] reported that students spent an average of 10-30 minutes daily on Facebook. Another study, conducted by Towner and Muñoz [12] also reported similar findings, where 22% of the students spent 10-30 minutes on Facebook. Concerns arise when students spend too much of their time on Facebook rather than studying. A study conducted by Hussain [4] found that 80% of students used Facebook for killing time. The finding indicates that many students spent their time on Facebook with no learning intentions, with a resultant lowering in academic grades. A study conducted by Kirschner and Karpinski [6] found that students who do not use Facebook have a better academic performance than those who frequently logged on into Facebook site. 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 [8][9]. Other than that, event functions can also be used to organize face-to-face class meetings. Wang et al. [13] in their study have used Facebook event function to organize weekly learning activities and obtained a good response from their participants. 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 [13].

Research Objective

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. Specifically, two research questions were formed in accordance to the research objective:

- What are students' perceptions of using Facebook as a learning tool?
- What are students' interaction patterns of learning via Facebook?

Method

This section first presents the study's population and participants, and then describes data collection and analysis for the study.

4.1.1 Participants

The targeted population of this study was the undergraduate students of Universiti Teknologi Malaysia (UTM). According to the official website of UTM, 10846 undergraduate students were enrolled in UTM (as this study was started). A random-purposive sampling method was used to select the samples. Within UTM undergraduate students, students who enrolled in the engineering course were purposively selected because they represent the largest group of students in UTM – 219 random students were chosen as a sample to answer the questionnaire in this study. The second lots of samples were selected based on a stratified-purposive sampling method for CSE course (SPM4712). A total of 80 students were purposively selected based on three different CSE course sections (SPM4712- Section 02, 03 and 05).

4.1.2 Data Collection and Analysis

There are two parts to the data collection of this study. The first part is the collection of data using questionnaires given to all final year engineering and non-engineering students (approximately 300) through an online method. The questionnaire was organized into three parts. Part A had eight questions on demographics and general use of Facebook. Part B questioned students' experiences on using Facebook. The last part, C, dealt with students' perceptions of Facebook as a learning tool. The second part of data collection was done through the Facebook page. A total of 80 students from three different CSE course sections (SPM4712- Section 02, 03 and 05) participated in the second part of the study. Data collected from questionnaires was analyzed by descriptive analysis, using Statistical Package for the Social Sciences (SPSS) software version 15.0. Next, a further independent t-test was performed to compare the perceived factors of learning through Facebook approaches between engineering and non-engineering students. Finally, data collected from the Facebook page was analyzed using content analysis to reveal students' interaction learning patterns through Facebook for the CSE course.

Results and Discussion

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 Mustafa et al. [7] who found that Malaysian youth spend 1-3 hours a day on Facebook. In investigating students' perceptions of using Facebook as a learning tool, seven constructs were identified, namely: social bonding, social bridging, sharing perspectives, communicative process, emotional/cohesiveness (social) expression, peers interaction, and tools and resources (learning). 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 [3][8][9]. The sharing perspective 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. Next, the communicative 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. However, the last three constructs (emotional/cohesiveness, peer interaction and tools and resources) show that there were significant differences between engineering and non-engineering students in terms of their emotional expression, reciprocal relationship and learning material support when engaging in Facebook activities. Finally, the Facebook interaction patterns show that SPT students had high participation and interaction leading to learning, but were average in social and cognitive aspects. On the other hand, SPL students showed an active participation, with high reciprocal interaction and high social cues, but average for cognitive aspect. In a similar vein, the SPI students showed an active participation and high reciprocal interactions, with average social and low cognitive aspects. As for the SPS 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 constructivism, which promotes knowledge being distributed across a network of connections for each group of students.

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