WHAT HIGHER EDUCATIONAL PROFESSIONALS NEED TO KNOW ABOUT TODAY'S STUDENTS: ONLINE SOCIAL NETWORKS

Jenny WANG
National Formosa University, Taiwan
wang170@yahoo.com

ABSTRACT
In this study, the author specifically focused on the most popular social media website—Facebook—and investigated the nature of student learning engagement associated with Facebook activity. Data pertaining to student Facebook use and activities were collected. Pearson's correlation coefficient was used to measure the relationships between Facebook instructional methods and grades. A linear regression was also performed to analyze the predictors of student grades. An empirical study of Facebook users (n= 134) during the 2011-2012 academic year revealed that course-based Facebook use had a significant positive effect on student learning engagement and grades. This study concludes that Facebook use in instruction assists students in achieving better grades, higher engagement, and greater satisfaction with the university learning experience. Thus, the author recommends the use of Facebook as an educational communication and interaction tool to enable faculty to assume a more active and participatory role in teaching and learning.
Keywords: social networks, learning engagement, Facebook, Web 2.0, Web 3.0

1. INTRODUCTION

In the year and a half since, the term "Web 2.0" has clearly taken hold, with more than 9.5 million citations in Google. Web 2.0 allows users themselves to make a difference to what the Internet does, navigating and exploring this web of knowledge. In particular, there is a focus on collaboration and communication among Internet users, people, and organizations of similar interests (Wang et al., 2010). Web 2.0 applications, new social networking tools, have been developed to enhance user involvement and engagement in the Web. The Web has become a platform in which the users can create, share, and pass along in a virtual community (Downes, 2005). In other words, Web 2.0 characteristics have clearly afforded new possibilities for user involvement. For educational use of Web 2.0 applications, such as Social Network Sites (SNSs), including MySpace, Facebook, wikis, blogs, and Bebo, can be used in a variety of ways to enhance student learning and help network and share resources with one another (Ajjan & Hartshorne, 2008; Alexander, 2006; Boulos & Wheeler, 2007; Ellison et al., 2007; Ellison, et al., 2011; Evans et al., 2010). It is not surprising that Web 2.0 plays a significant role in the university teaching and learning setting.

Web 3.0 is already here and more 3.0 applications will emerge soon. "Semantic Web", as part of Web 3.0 technology, enables computers and Web servers to communicate with each other to generate meaningful and personalized search results. An example of this Web 3.0 technology is "natural-language" search, which refers to the ability of search engines to answer full-questions, which users type to search for the answers. A semantic answer engine has the ability to search for keywords to list all the possible answers for the users. Semantic Web is a term coined by Tim Berners-Lee who first invented Web. The primary components of Web 3.0 include web operating systems, smart phone and geo-location integration, and heavy identity-base services coupled with data and identity portability (Waddell & Selvanarayanan, 2009). Many Web 3.0 applications are currently in use on social networks sites and bring some impacts on education. For example, with Google Docs, students can collaborate on a group project. The students can keep up with changes on their documents, spreadsheets, and presentation regardless of the location, as long as they have browsers or applications. Dropbox is another Web 3.0 application to share the document files with others. Besides, students can also save all the photos, docs, and videos in the Dropbox at school and continue to finish on the home computer (Dropbox, 2013). Students can access their files from computers or phones and share or exchange information while working on project in real time using Dropbox. With a high speed of the Internet of Web 3.0, students can see a video of others on YouTube just seconds after the video was taken. Without high speed cellphone network or high speed landline network, users would not be able to do a lot of videos on the phone. For instance, students can search for video or content anytime anyway. They can pull up a video to learn a particular lesson from a professor from a top institution in the world from their portable devices. Students can also subscribe to teaching Podcast to watch the class lectures. TuneIn app for example also allows users to stream any audio system, including music, sports, and news in the world. Students can listen to any radio station globally and enjoy millions of on-demand programs, like podcasts, concerts, and interviews (TuneIn 2013). Google+ Hangouts app allows a small group to start a discussion group. Hangouts app is a video chat (or video teleconferencing) with up to 9 friends at the same time, seeing anyone's reactions face-to-face. Students can get work done in virtual meetings or watch YouTube clips together from a computer, phone, or tablet device (Google, 2013). Facebook also recreated a schmooze space for academics. It helps students stay connected with one another.

In truth, now, almost anyone can build a social page and personalize the design and edit content. User now expects no matter where he/she goes he/she can find Internet access, or at least use his/her portable devise (eg. iPhone) to stay connected. Indeed, Web 3.0 social apps are currently in used for instructional support tools in higher education. The last decade has witnesses an increase in Web-based instruction in many classrooms. Technology has enabled students in these classrooms to learn in new ways.

1.1 Social Network Sites

A major category of Web 2.0 applications is social networking activities. SNSs such as Facebook, MySpace, and Twitter, have been widely used and many college students have integrated these sites into their daily lives (Boyd & Ellison, 2008; Cotton, 2008). To date, there are hundreds of SNSs (see Table 1), fitting easily with modern views on the deeply social nature of human mentality and support communication between users (Alexander, 2006; Franklin & van Harmelen, 2007). Boyd and Ellison (2008) defined SNSs as Web-based services that feature functional practices for individuals, all of which are related to users' engagement. They are as shown as follows.

(1) Construct a public or semi-public profile within a bounded system;
(2) Articulate a list of other users with whom they share a connection; and
(3) View and traverse their list of connections and those made by others within the system (p. 211).

Table 1. Major SNSs and Their Launch Dates.

Name	Active User Accounts	Launch Date	Referral Traffic Ranking
Facebook	901+ million	02/2004	1
Twitter	900+ million	03/2008	3
Skype	663+ million	08/2003	
Qzone	536+ million	02/1999	
Windows Live	500+ million	11/2005	
TencentWeibo	425+ million	04/2010	
Habbo	230+ million	08/2000	
Vkontakte	167+ million	10/2006	
Badoo	121+ million	11/2006	
Beno	200+ million	07/2005	
LinkedIn	100+ million	05/2003	6
Google +	62+ million	06/2011	5
Reddit	35 + million	06/2008	4
Pinterest	11 + million	03/2010	2

Note: The information was updated in March 2012.

Source from Wikipedia (2012), "List of virtual communities with more than 100 million users".

2. THEORETICAL BACKGROUND

2.1 Facebook

With social networking activities becoming the predominant Web 2.0 application, Facebook has been the most popular social networking site to date. Similar to other virtual communities in SNSs, Facebook allow users to interact with people whom they already know offline or to meet new people. In addition, Facebook provides social and emotional support, information resources and bounds with other people and others who work, study, and live around them (Cheung et al., 2011; Eyadat & Eyadat, 2010). Facebook users can present themselves in their own online profiles, share resources with their friends who can post comments on each other's pages and view each other's profiles. Facebook users can also join virtual groups and organizations based on similar interests, meet people with similar interests, received the updated news, and share the information. Facebook provides a variety of add-in functions, including online games, virtual farms, virtual pets, the wall, virtual gifts. Additionally, Facebook also provides a special feature of news feed, that users can browse their friends' movements on Facebook.

Created in 2004, the social networking giant, Facebook has announced that it reached 1 billion monthly active users in September 2012 (Smith, et al., 2012). Regarding various regions around the world, Facebook has 179 million monthly active users in the US and Canada, 229 million in Europe, and 212 million in Asia (McCarra, 2012). In 2009, Facebook has surpassed its competitor MySpace, which was used to be the most popular SNS.

Along with the Web 3.0 trend, more than 425 million active users access Facebook through mobile devices across 200 mobile operators in 60 countries (Protalinski, 2012). In June 2012, Facebook launched its App Center which allows its users in finding games and other social apps easily. Facebook reported that it now has 150 million monthly users with 2.4 times the installation of apps (Lunden, 2012). It brings Facebook to be the traffic king of the social sites in 2012 as illustrated in Table 1. The site is tightly integrated into the daily life practices of its users (Cassidy, 2006). The most popular Facebook activities are likes and comments. Users like and comment a massive 3.2 billion times daily and upload 300 million photos in a similar period. Meanwhile, Facebook handles 50 billion photos from its user base. With the Big Data portability of Web 3.0 component, users can fetch information or find data which become transferable across applications and software.

2.2 Facebook and Student Engagement

In the context of student learning, Astin (1984) defined engagement as "the amount of physical and psychological energy that the students devote to the academic experience" (p. 297). Today, engagement means the time and effort students spend on educational-wise activities that are relatively linked to college academic work (Kuh, 2009). Chickering and Gamson (1987) offer 7 principles for improving undergraduate education based on research on good teaching and learning in colleges and universities. All of these principles are related to student engagement.

Good practice in undergraduate education:

(1) Encourages contact between student and faculty.
(2) Develops reciprocity and cooperation among students.
(3) Encourages active learning.
(4) Gives prompt feedback.
(5) Emphasizes time on task.
(6) Communicates high expectations
(7) Respects diverse talents and ways of learning. (Washington Center News)

Academic Facebook studies (Hewitt & Forte, 2006; Mazer et al., 2007; Tuncay & Uzunboylu, 2010) determine that Facebook use in college is significantly related to student motivation to learn, affective learning and classroom climate, and faculty and student relationships. Instructors can use Facebook to connect and bridge a venue to better communicate with their students. Facebook can be served as a means to communicate with students to extend the traditional physical classroom to a virtual classroom communication. Through the Facebook, information can be exchanged. Godwin-Jones (2008) claims that Facebook is the tool and platform "that enhance communication and human interaction can potentially be harnessed for language learning" (p. 7). From the language learning perspective, Blattner and Fiori (2009) study on the use of Facebook as a valuable tool for authentic language interaction and as a platform for increasing students' motivation and enhancing their English learning.

Chen et al. (2010) in a study using data from the National Survey of Student Engagement (NSSE) found that there is significant relationship between the use of educational technology and student engagement. Studies (Astin 1984; Heiberger and Harper, 2008) that focus on particular relationships between social media and engagement also found positive correlation between social networking website use and college student engagement.

2.3 Facebook and Interaction

Interaction is an essential element in any learning environment that is a necessary and fundamental process for knowledge acquisition and cognitive and physical development (Barker, 1994). Furthermore, interaction directly influences learners' learning (Hirumi, 2002; Woo & Reeves, 2007). Interaction is defined as "a dialogue or discourse...between two or more participants and objects which occurs synchronously and/or asynchronously mediated by response or feedback and interfaced by technology" (Muirhead & Juwah, 2004, p. 13). Scholarly studies of Facebook (Hewitt & Forte, 2006; Mazer et al., 2007; Tuncay & Uzunboylu, 2010) reveal a significant relationship between the use of Facebook among college-age respondents and higher motivation to learn, more effective learning and classroom climate, and improved faculty-student relationships. Facebook serves as a means for instructors to connect, befriend, and communicate with students to extend the communicative activities of the traditional physical classroom to a virtual form.

2.4 Facebook Use and Academic Performance

Most of the research on the academic performance of Facebook use has been conducted at the higher education level and has found disparate results. For instance, some studies (Kirschner & Karpinski, 2010; Banquil et al., 2009; de Villiers, 2010) have found that Facebook use denoted negative effects on a student's performance in school. Researchers found that Facebook users had significantly lower grade point average (GPA) compared to

non-users; additionally, Facebook users reported spending fewer hours per week on their school work than non-users. On the other hand, some researchers (Pasek, et al., 2009) found there was no significant relationship between Facebook use and GPA. However, the relationship between Facebook use and GPA did not appear to depend on Facebook-based instruction over learning performance. Prior studies have not examined whether the instructors used Facebook as a part of curriculum. Weather Facebook actually facilitate learning and/or help students achieve better grades is, however, unclear. If getting good grades is an important goal, how to merge students' social and academic lives and integrate their social communication tool with classroom learning tool should be a critical factor in reaching that goal.

3. RESEARCH METHOD AND RESEARCH QUESTIONS

3.1 Purpose of the Study and Research Questions

Clearly, Facebook is not a passing trend but it becoming ubiquitous. Educational professionals much explore ways in which they could use social networking for educational relevant purposes. Thanks to the innovative teaching and learning approaches to education utilizing technology, the last two decades have witnessed an increase in computerized instruction in many classrooms. Students in these classrooms are simultaneously learning in new ways with technology. As the use of information technology in classroom instruction has been increasing dramatically around the world, it is also natural that it should play a significant role in the university teaching and learning setting. In this study, the author seeks to promote an effective, alternative avenue for fostering engagement in terms of interactions and relationships among students, instructors, and institution in a sample of Asia university students. Figure 1 illustrates the engagement flow for how the SNSs connect each other.

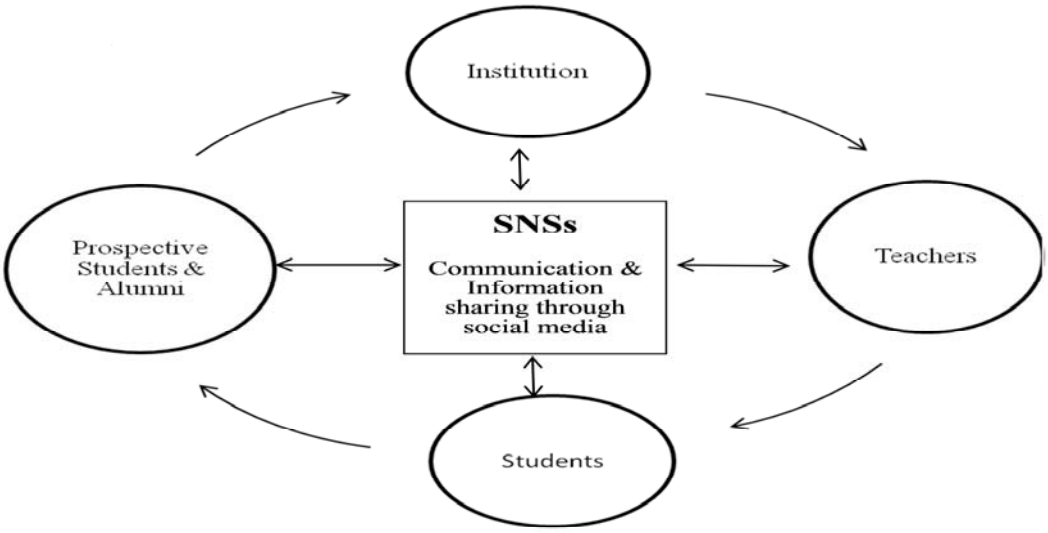

Figure 1. Interaction Diversity Through SNSs.

The research questions examined are:

1. What students do on Facebook?
2. In what ways do students perceive Facebook pedagogical practices in terms of interactions and relationships between student and teacher, student and student, and student and institution?
3. What effects do Facebook pedagogical practices for educationally relevant purposes have on students' academic grades?
4. Is there a relationship among frequency of Facebook activities and grades? What effect does the frequency of Facebook activities have on students' academic grades?

3.2 Sample

Convenient purposeful sampling procedures were used. Two-university-class students in both Applied Foreign Languages (AFL) program and Business Administration (BA) program participated in the study. Two classes ranged from sophomore to junior year classification. Both classes used Facebook as part of after class classroom communication platform. After obtaining permission from these students' lecturers, students were asked to participate in the study by taking a 60-min Facebook introduction training session at beginning of the

study and filling out a survey (the survey containing the student engagement instrument) at the end of the study. All of the participants were acknowledged both training and survey participation were voluntary actions.

Of the 134 questionnaires that were distributed, 134 (100%) were returned and 130 were valid. It represents a 97.15% response rate. Of the AFL major group, 68 out of 70 (52.31%) students participated while 62 out of 64 (47.69%) of BA group in participation rate. Therefore, there was no significant difference between groups in participation rate. Sixty-seven percent were female and 33% were male. The entire respondents (100%) were aged 20-24. Again, 100% of them were full-time undergraduate students.

3.3 Instrument

The instrument consisted of three sections: demographics (10 items), student engagement (26 items), and frequency of Facebook activities (20 items). The items in the first and the last sections were prepared by the researcher and aimed to collect demographic information and the frequency of Facebook activities. The items in the second section of the instrument were modified from the questionnaire of the NSSE. NSSE is the most well-known and widely used college student engagement questionnaire for educationally relevant contexts (Chen et al. 2010; Kuh, 2009). For use in this study, the scale was modified so that the items could be specific to good practices in undergraduate education to measure college student engagement in educationally relevant practices and engagement in Facebook pedagogical practices. There were 7 categories concerning student engagement which were teacher caring (TC), teacher trustworthiness (TT), teacher and student relationship qualities (TQ), cooperative learning (CL), active learning (AL), student and student relationship qualities (SQ), and student and institution relationship qualities (SI). The three-page questionnaire was pre-tested on a group of 10 undergraduate students to ensure that the questions would be interpreted correctly and understood by the target sample. After the pre-test scale was compiled, 3 experts in e-learning were invited to review the scale. The instrument was then modified and finalized based on the suggestions provided.

Interactions and Relationships between Students and Faculty

For the items concerning the interaction of students with faculty and other students, the participants responded on a 5-point Likert-type scale that ranged from "definitely agree" to "definitely disagree". For the analyses, "strongly disagree" was coded as 1, and "strongly agree" was coded as 5. For the items concerning student and faculty relationships, the participants responded on an 8-point scale that ranged from "unhelpful/unsympathetic" to "helpful/sympathetic". A response of 1 was coded as "1", 2 or 3 was coded as "2", 4 or 5 was coded as "3", 6 or 7 was coded as "4", and 8 was coded as "5". The final scale consisted of 11 items with 4 items on teacher caring (TC), 5 items on teacher trustworthiness (TT), and 2 items on student and teacher relationship qualities (TQ). The Cronbach's α reliability estimates from the research data were .81 for the TC subscale, .89 for the TT subscale, and .45 for the TQ subscale, as shown in Table 2.

Interactions and Relationships between students and students

The quality of interactions and relationships among students was measured via the subscales of cooperative learning (CL), active learning (AL), and relationships with other students (SQ). There were 5 CL items, 4 AL items, and 2 SQ items. The final scale consisted of 11 items. For the items pertaining to CL and AL, the participants responded on a 5-point Likert-type scale that ranged from 1 ("definitely disagree") to 5 ("definitely agree"). For the items concerning student-student relationships, the participants responded on an 8-point scale that ranged from "unsupported, sense of alienation" to "supportive, sense of belonging". A response of 1 was coded as "1", 2 or 3 was coded as "2", 4 or 5 was coded as "3", 6 or 7 was coded as "4", and 8 was coded as "5". The Cronbach's α reliability estimates from the collected data were .83 for the CL subscale, .78 for the AL subscale, and .62 for the SQ subscale (Table 2).

Student Perceptions of the Institution

This subscale measured student satisfaction with life at the institution. Student perceptions of the institution (4 items, α= .74) accounted for 8.19% of the variance in the measure (Table 2). The participants responded to 4 items in this subscale on a 5-point scale that ranged from 1 ("strongly disagree") to 5 ("strongly agree").

Frequency of Facebook Activities

The final section of 20 items is to collect student usage of Facebook. In this part, students were asked "How frequently do you perform the following activities when you are on Facebook?" For each item, students were asked to response on a five-point Likert scale ranging from "Very Frequently (100%) to "Never" (0%).
A response of 1 was coded as "never (0%)", 2 was coded as "rarely (25%)", 3 was coded as "sometimes (50%)", 4 was coded as "somewhat frequently (75%)", and 5 was coded as "very frequently (100%)".

Table 2. Descriptive Statistics of Student-Faculty, Student-Student, and Student-Institution Relationships and Items Reliability.

Abbrev.	Scales & Subscales	Overall		Reliability
		Mean	SD	(# of items)
	Student-Faculty			.72 (11)
TC	Teacher Caring Qualities	3.67	.71	.81 (4)
TT	Teacher Trustworthiness	3.66	.75	.89 (5)
TQ	Teacher-Student Relationship	4.08	.63	.45 (2)
	Student-Student			.75 (11)
CL	Cooperative Learning	4.36	.56	.83 (5)
AL	Active Learning	4.24	.64	.78 (4)
SQ	Student-Student Relationship	4.45	.56	.62 (2)
	Student-Institution			.74 (4)
SI	Student-Institution Relationship	3.58	.72	.74 (4)

Student Grades

Grades were coded with responses below 59 as '1', responses 60-64 as '2', responses 65-69 as '3', responses 70-74 as '4', responses 75-79 as '5', responses 80-84 as "6", responses 85-89 as "7", and responses above 90 as "8".

3.4 Procedure

This study was conducted in university courses at a 4-year university. At the beginning of the study, the researcher set up two independent private Facebook groups particularly for these classes. During the second week of the first semester, two classes of the participants (n = 134) were introduced to the Facebook SNS and received an hour-long training session on how to use Facebook. During the training session every of the students were all added into his/her own class Facebook page. Every student in the group was told to have an opportunity to access online at their convenience between classes. The students were expected to work in groups to share ideas, start and develop a project, and participate in a discussion on Facebook. Two individual groups of Facebook pages were administered and managed independently by the author. The goal was to examine how students reflected to all of the "seven principles for good practice in higher education" that was proposed by Chickering and Gamson (1987). After two 18-week semesters including a winter break between the semesters (total of 10 months), the participants (n= 134) completed the research instrument during the final week of the second semester during their face-to-face regular class hours. All the participants were told to fill out the research instrument voluntarily.

4 RESULTS

4.1 Demographic Statistics

In this study, there were 134 participants, including 109 (81%) females and 25 (19%) males. All (100%) of them were full-time undergraduate students between the ages of 20 and 24. The mean age of the sample was 22 with a standard deviation of 1.21. None of participants reported that he/she did not have a Facebook account prior to the start of the course.

4.2 Research Question1: Facebook Usages

Research question 1: What students do on Facebook? Facebook is a Web-based social communication application. As such, time spent on Facebook and frequency of daily Facebook check affect students' Facebook usage activities. Facebook activities include updating one's status, chatting, or uploading or tagging music or photos. Hence, the need to identify Facebook usages patterns the amount of time spent on Facebook and frequency of daily Facebook check. Frequencies, percentages, and the nonparametric tests were employed for this research question.

- The students spent a mean of 116.87 (SD 56.25) minutes per day on Facebook.
- The students checked Facebook a mean of 3.30 (SD 1.33) times per day.

Before determining what students do on Facebook, identify how much time students spent on Facebook and how often they check their Facebook pages daily was studied. The results indicated that respondents spent an average of 116.87 minutes with a standard deviation of 56.25 minutes logged onto their Facebook accounts. Daily Facebook usage by male and female respondents was compared using the nonparametric test, Kolmogorrov-Smimov test, with the results rejected the null hypothesis (p= .001). The analysis (z= 4.25; p<.05) also show that there was significant difference in time spent on Facebook across genders. The female respondents spent more time on the site daily compared with the male respondents. Females spent an average of 122 minutes (or 2.0 h) daily, compared to an average of 103 minutes (1.7h) daily for males participating in

Facebook activities. The average amount of time spent on Facebook site exceed the amounts that were than reported by Ellison et al. (2007), Pempek et al. (2009), and Junco (2009). A possible explanation for the higher averages in the current study may be that students were given opportunities to communicate with instructors between classes, discuss class projects with group members online, hand-in class assignments through online tools, and do online research. These tasks may have caused the participants of this study to remain logged in to their Facebook accounts while engaging in online class activities.

Table 3 illustrates the relationship between the amount of time spent on Facebook and the program of study as tested by Pearson's chi-square tests of association. The program of study (AFL and BA) yielded insignificant results (χ^2= 1.64; p= .89). Therefore, the data collected from 2 classes were combined for further analysis.

Table 3. Comparison of the Amount of Time Spent on Facebook and Demographic Profile Using Chi-Square Tests.

Amount of time spent on Facebook	**χ^2 (p-value)**	**Cramer's V (p-value)**
Program of study	1.64 (.89)	0.16 (.90)

The students in the sample spent a substantial amount of time on Facebook every day. Students reported checking Facebook a mean of 3.30 (SD 1.33) times per day. There was a moderate correlation between the amount of time spent on Facebook and checking Facebook frequency (Person's r = .40, p<.01). The students reported that they participated in a variety of Facebook activities as chatting (84.62%), viewing photos (66.15%), and commenting on friend's posts (64.61%) being the most popular activities. Many of them also used Facebook to start projects (58.46%) and share Information (49.23%). Frequencies of Facebook activities found in this study were generally inconsistent with those reported by Pempek et al. (2009).

Frequency of Facebook activities was broken down into 5 categories: never (0%), rarely (25%), sometimes (50%), somewhat frequently (75%), and very frequently (100%). Figure 2 shows the different Facebook activities according to the most two frequent categories of frequency, ranged from 75% to 100%. Drawn from the results of this study, 84.62% of the respondents are between the ranges of 75% to 100%, indicating that this group of people is in the groups of somewhat frequently and very frequently chatting on Facebook while only 41.54% of the respondents playing games. Interestingly, only two (1.49%) stated using non-game applications on Facebook very frequently. The result is inconsistent with a previous study (Junco, 2011) that found that most of the students (71%) use Facebook to play games very frequently.

4.3 Research Question 2: Facebook Pedagogical Practices

Research Question 2: In what ways do students perceive the effective Facebook pedagogical practices in terms of interactions and relationships between student and teacher, student and student, and student and institution? It was important to ascertain whether how much time students spent on Facebook affected or influenced the amount of time they spent preparing for class, the time they spent on participating in co-curricular activities on campus, and the amount of time they spent for relaxing and socializing (watching TV, partying, etc.) To what effect, several cross-tabulations were performed.

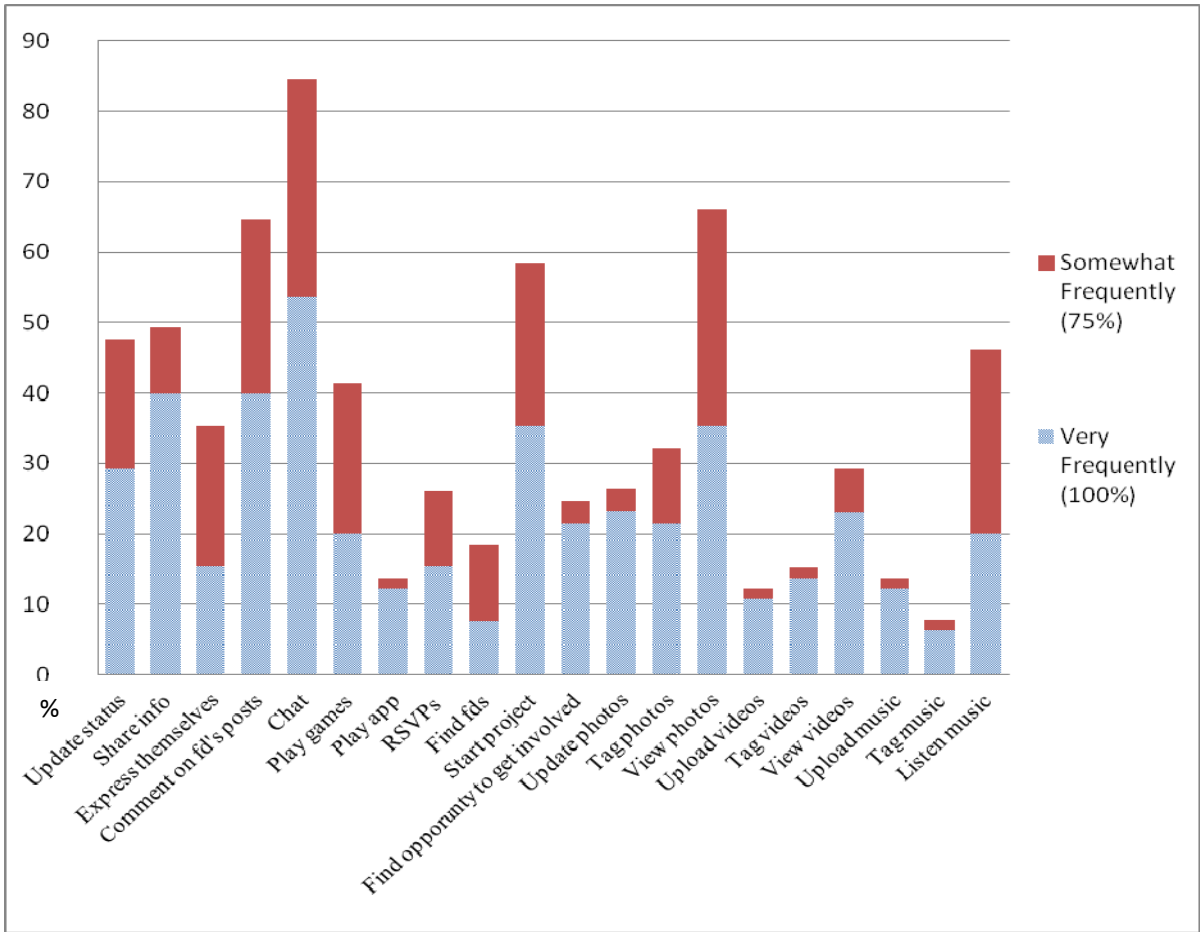

Figure 2. Most Often Frequency Facebook Activities.

The correlation between the amount of time spent on Facebook and the amount of time spent preparing for class was not significant (Pearson's r = .15, p> .1). There was a moderate correlation between the amount of time spent on Facebook and the amount of time spent on participating in co-curricular activities (Pearson's r= .48, p< .001). Regarding amount of time spent on co-curricular activities, a moderate correlation was also founded between the amount of time spent on participating in co-curricular activities and student perception of the institution (Pearson's r= .38, p< .01). Furthermore, there was a substantial correlation between the amount of time spent on Facebook and the amount of time spent on relaxing and socializing (Pearson's r= .60, p< .001). There was a relatively low correlation between the amount of time spent on relaxing and socializing and the amount of time spent on participating in co-curricular activities (Pearson's r= .30, p< .005), and preparing for class (Pearson's r= .28, p< .005). It is very interesting to note that how much time student spent on Facebook has nothing to do with how much time they spent preparing for class. More importantly, students who spent more time on Facebook were more likely spent more time participating in co-curricular activities, including organization, student government, or intercollegiate sports on campus. Kuh (2009) claims that the amount of time and effort that students spend on educational activities is the engagement. This finding supports researcher's claim that there is a significant relationship between the use of educational technology and student engagement (Chen et al., 2010).

Prior to analysis, 11 items of interactions and relationships between student and teacher, 11 items of interactions and relationships between student and student, and 4 items of student perceptions of institution were calculated for mean scores and standard deviation as illustrated in Table 4.

Student and Instructor Interactions & Relationships: More than half of the respondents (60.63%) expressed that their instructor paid attention to the needs of students and they (62.10%) felt their instructor was open and honest with them. Two thirds (66.58%) of the students felt their instructor cared about them. In sum, many students (69.75%) indicated that their instructor was helpful and sympathetic. The results support the previous scholarly studies (Hewitt & Forte, 2006; Mazer et al., 2007; Tuncay & Uzunboylu, 2010) that Facebook improved faculty and students relationships.

Table 4. Mean, Standard Deviation, and Number of Items in Each Subscale.

Abbrev.	Sub-Scales	Number of items	Mean	Standard deviation
TC	Teacher caring	4	3.67	.51
TT	Teacher trustworthiness	5	3.66	.56
TQ	Relationship qualities between student and teacher	2	4.08	.40
CL	Cooperative learning	5	4.36	.32
AL	Active learning	4	4.23	.40
SQ	Relationship qualities between student and students	2	4.45	.31
SI	Student perception of the institution	4	3.58	.51

Student and Student Interactions & Relationships: It is very interesting to note that the respondents overall showed better interactions and relationships with their fellow students than those with their instructor. Most of the respondents (93.95%) stated that they were enjoy chatting with friends. Similarly, a majority of them (90.13%) indicated that interacting with friends was fun. Many participants (75.70%) also indicated that other students cared about them. Almost all of the students (95.52%) described their peers at this institution was very supportive and reported experiencing a strong sense of belonging. This finding supports Godwin-Jones' (2008) study as he reported that Facebook as a tool enhances communication and human interaction. Therefore, it can be interpreted that Facebook can forge interactions and bond relationships among students themselves.

Student's Perceptions of the Institution: Three fourths of the respondents (74.25%) agreed that they felt getting connected with the university from talking with their classmates on Facebook. In addition, more than two thirds of the respondents (69.68%) agreed that the entire educational experience at this institution was excellent. This finding is consistent with those of previous research (Cheung et al., 2011; Eyadat & Eyadat, 2010) that Facebook bonds with other people and others who live around them.

4.4 Research Question 3: Facebook Pedagogical Practices VS. Grades

Research question 3: What effects do the effective Facebook pedagogical practices for educationally relevant purposes have on students' academic semester grades? Prior to regression analysis, the mean scores from 3 subscales of student and teacher interactions and relationships, 3 subscales of student and student interactions and relationships, and 1 subscale of student perceptions of the institution were examined for both univariate and multivariate outliers. The deletion of two cases with univariate outliers of the student and teacher items left 128 cases for the following analysis.

Table 5 illustrates a correlation matrix of 7 subscales and students' grades. The variable of students' grades has a moderate positive relationship with TC (Pearson's r= .40) and CL (Pearson's r= .42). The variable of TC has a substantial relationship with TT (Pearson's r= .61). The results show overall AL has low associations with all the 3 variables of student and teacher interactions and relationships, but relatively substantial positive relationships with CL (Pearson's r= .59), and SQ (Pearson's r= .57) at the .01 level.

Table 5. Intercorelations Between Facebook Pedagogical Practices and Grades.

grades	**TC**	**TT**	**TQ**	**CL**	**AL**	**SQ**	**SI**	
grades	1.00	.40	.38	.33	.42	.05	.06	.38
TC	.40	1.00	.61	.44	-.01	-.14	-.28	-.02
TT	.38	.61	1.00	.83	.31	.23	.28	.16
TQ	.33	.44	.83	1.00	.22	.17	.31	.22
CL	.42	-.01	.31	.22	1.00	.59	.53	.60
AL	.05	-.14	.23	.17	.59	1.00	.57	.17
SQ	.06	-.28	.28	.31	.53	.57	1.00	.36
SI	.38	-.02	.16	.22	.60	.17	.36	1.00

The linear regression predicting grades using the amount of time spent on Facebook ($F_{(7, 125)} = 5.85$, $p < .05$) was significant (Table 6). The linear aggression predicting grades using the amount of time spent on co-curricular activities ($F_{(7, 126)} = .66$, $p < .001$) was significant (Table 7). Linear aggression predicting the amount of time spent on co-curricular activities on campus using teacher caring ($F_{(6. 124)} = 3.48$, $p < .05$) was significant (Table 8). Together, grades and the amount of time spent on co-curricular activities collectively account for 27.7%, 41.8%, 21.9% respectively of the variance of the amount of time spent on Facebook, amount of time spent on

co-curricular activities on campus, and Facebook pedagogical practices. Both amount of time spent on Facebook and the amount of time spent on co-curricular activities on campus explained significantly the variance in grades. The results also found that the Facebook pedagogical practices, teacher caring qualities explained significantly the variance of the amount of time spent on curricular activities on campus. This finding is consistent with those of previous research on educational technology, which has shown that the manner in which technology is used tends to be a stronger predictor of outcomes than the amount of time that is spend using the technology (Cotton, 2008; Ellison et al., 2007; Heiberger & Harper, 2008; Pempek et al., 2009).

Table 6. Linear Regression for Facebook Pedagogical Practices and the Amount of Time Spent on Facebook Explaining Grades.

Variables	β	SEB	β	*t*	Sig. (t-tailed)
TC	.58	.30	.30	1.90	.06
TT	-.30	.43	-.16	-.69	.49
TQ	.35	.41	.16	.87	.39
CL	1.34	.41	.54	3.25	.00**
AL	-.51	.31	-.23	-1.65	.11
SQ	-.20	.37	-.08	-.55	.58
SI	.21	.26	.11	.81	.42
Amount of time spent on FB	.01	.00	.29	2.63	.01**

Note: β= Beta, the standardized regression coefficient. R^2= .277. **p< .05

Table 7. Linear Regression for Facebook Pedagogical Practices and the Amount of Time Spent on Co-Curricular Activities on Campus Explaining Grades.

Variables	β	SEB	β	*t*	Sig. (t-tailed)
TC	.12	.33	.06	.35	.73
TT	-.12	.41	-.06	-.28	.78
TQ	.49	.41	.22	1.19	.24
CL	.99	.39	.40	2.51	.02
AL	-.41	.29	-.19	-1.41	.16
SQ	-.32	.36	-.130	-.88	.38
SI	.13	.26	.07	.52	.61
Amount of time spent co-curricular	.45	.12	.43	3.73	.00***

Note: β= Beta, the standardized regression coefficient. R^2= .418. ***p< .001

Table 8. Linear Regression for Facebook Pedagogical Practices and the Amount of Time Spent on Co-Curricular Activities on Campus Explaining Grades.

Variables	β	SEB	β	*t*	Sig.(t-tailed)
TC	1.02	.35	.52	2.93	.01**
TT	.17	.46	.09	.36	.72
TQ	-.46	.46	-.22	-1.02	.32
CL	.35	.44	.15	.81	.42
AL	.11	.33	.06	.35	.73
SQ	.25	.40	.10	.61	.54
SI	.27	.29	.14	.93	.36

Note: β= Beta, the standardized regression coefficient. R^2= .219. **p< .05

4.5 Research Question 4: Frequency of Activities VS. Grades

Research Question 4: Is there a relationship among frequency of Facebook activities and grades? What effects does the frequency of Facebook activities have on students' academic semester grades? To examine the relationship among the frequency of Facebook activities and grades, Pearson's r was used. The results indicate that there was a moderate relationship between starting projects and grades (Pearson r= .35, p< .001). On the

other hand, playing games (Pearson r= -.23, $p< .01$) and spending time using non-game applications (Pearson r= -.21, $p< .01$) have negative relationships with grades. Students playing games or using non-game applications on Facebook are more likely to have lower grades.

The linear regression was also used to predict grades using Facebook activities. Among the frequency of the 20 Facebook activities, starting projects ($\beta = .76$, $p<.001$), uploading videos ($\beta = .61$, $p< .05$), tagging videos ($\beta = .62$, $p< .05$) were positive predictors of grades; while playing games ($\beta = -.24$, $p< .001$) and using non-game applications ($\beta = -.03$, $p< .001$) were negative predictors of grades. Starting projects was the strongest predictor of overall average grades with a β of .758 ($p< .001$). This finding underscores the value of technology as suggested by Ellison (2007) and Pempek et al. (2009). They claimed that the importance of how to utilize technology tool was significantly related to the learning outcomes. Nevertheless, playing games was the strongest negative predictor of overall average grades with a β of -.24 ($p< .001$) which is also consistent with the several studies focusing on Facebook and GPA (Banquil et al., 2009).

5 DISCUSSION

Congruent with findings by other studies (Heiberger & Harper, 2008; Pasek, et al., 2009) but conflicting with findings by Kirschner and Karpinski (2010) and Astin (1984), the amount of time spent on Facebook was positively predictive of grades. In this study, the amount of time spent on co-curricular activities on campus was also and yet a strongly positively predictive of grades, and positively related to engagement. More importantly, specific Facebook activities are stronger predictors of student engagement, grades, and the amount of time spent in co-curricular activities on campus than the amount of time spent on Facebook. This is consistent with previous research studies on educational technology explaining how technologies are used is more important than the amount of time spent on the technology in predicting outcomes (Cotten, 2008; Ellison et al., 2007; Heiberger & Harper, 2008; Pempek et al., 2009). Furthermore, the measure using the amount of time spent on Facebook predicted 27.7% of the variance in grade. And also the measure using Facebook pedagogical practices predicted 21.9% of the variance in the amount of time spent on co-curricular activities in grades. The results indicated countable predictive power as predicting 27.7% and 21.9% of the variance.

Students use Facebook in ways that are both positively and negatively related to their grades and engagement. It is important to examine the real-world implications of these findings to better understand why students engage in Facebook activities. Specifically, starting projects, uploading videos, and tagging videos were positively predictive of grades, while playing games and using non-game applications on Facebook were negatively predictive of grades. The fact that using Facebook in certain ways led positive outcomes and being positive predictor of engagement in the real world suggest that some of the ways in which students may be related to the construct of engagement leading to greater academic benefits (Kuh, 2009). The results of Facebook pedagogy and learning engagement discovered in this study suggest that Facebook can be integrated in part of pedagogy to engage students in ways that are important for their academic outcomes and engagement learning, which support Chickering and Gamson's (1987) seven principles for good practices in undergraduate education, as shown as follows.

- Taking advantages of Facebook communication features with continue and learning environment, students were encouraged to communicate more with teachers. (principle 1)
- The use of Facebook, students started their project online and discussed with their group members. Served as a learning artifact, Facebook provides an easy-to-use collaborative technology for students to work collaboratively. Students also obtained motivation and encouragement from their peers by expressing their own emotions. Thus, Facebook fosters a sense of belonging to a specific group. (principle 2)
- Facebook assignments promote active learning. The students used Facebook actively sharing and exchanging knowledge and information to discuss academic and campus issues among all members. (principle 3)
- Both the teachers and students were able to receive prompt feedback for a range of questions that were posted on the site. Prompt responses to requests for help or feedback allowed students to engage in their learning activities according to their individual needs and individual pace. Meanwhile, by Facebook Chat, a feature similar to MSN messenger, students were able to see who is present online and process online chatting with them in a real-time. (principle 4)
- Class discussion was extended outside of the classroom. Learning never stopped between classes via Facebook. Using Facebook was able to maximize time on task. (principle 5)

- The teachers delivered high expectations through the communication on Facebook in student's projects, course assignments, and class materials and promoted learning and knowledge sharing both inside and outside of classroom. (principle 6)
- Finally, the use of Facebook showed a respect for diverse talents and ways of learning. For example, shy students who may not ask questions face-to-face in class were given an option to ask their questions online. (principle 7)

5.1 CONCLUSION

The study results made three significant contributions. First, the use of Facebook contributes to the level of learning engagement in the real world. Particularly, Facebook helps students merge their social and academic lives. As higher educational professionals, it is always good to know where to meet their students. In this study, Facebook was used to build and bridge a diversity of interaction and nurture personal relationships between instructors and students. The students in this study were heavily engaged and expressed satisfaction with their instructors, peers, and institution. Second, through the use of a popular Web 2.0 and Web 3.0 artifacts, learning engagement occurs in a smooth transition from both inside and outside of the classroom. As higher educational professionals, it is essential to help student gain benefits and engage more beneficial uses of technologies. Therefore, it is important to understand that integrating the use of Facebook or some other Web 2.0 and Web 3.0 applications and pedagogical strategies can truly improve engagement and meet where they are. The instructors must well utilize the SNSs and organize class materials and activities in parallel with various pedagogical strategies. Third, using Facebook as a new learning artifact in certain way led to better academic outcomes (Ellison et al., 2011). Facebook can indeed empower the e-learning environment. Use of Facebook opens a new world of possibilities where students can engage in learning activities anywhere and at any time with the assistance of instructional support and real time feedback. Facebook is definitely not a time waster. It is therefore clear that current thinking about the implementation of new learning social networking sites in classroom curricular is in step with the affordances of Web 2.0 or Web 3.0 activities. As higher educational professionals, it is essential to know how to match the affordances of technologies with their class curricular to enable rich learning opportunities for their students.

Furthermore, recommendations for further studies of Facebook or other SNSs in educational settings are suggested. Conducting controlled experiments to confirm and verify the cause-effect inferences are recommended. Researchers must continue to explore the relationships and factors that are associated with student Facebook use in relation to academic learning outcomes. Establishing a qualitative study and monitoring students' learning progress via Web 2.0 artifact is suggested.

Finally, mobile learning studies implementing the use of mobile devices to exercise collaborative activities at virtually any place and any time in Web 3.0 environments are also suggested.

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