The Facebook Effect in University Classrooms: A Study of Attitudes and Sense of Community Using an Independent Measures Control Group Design

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Facebook is one type of social networking media that is growing in prominence in the lives of university students, including their higher education courses. Using an independent measures static group comparison research design, this study analyzes the questionnaire responses of 586 university level students. The responses of students exposed to Facebook-enhanced business courses were compared with those in non-Facebook-enhanced courses. It was found that students in the Facebook-enhanced courses reported having more favorable attitudes toward the social media and a slight increase in their sense of classroom community compared to students in non-Facebook-enhanced courses. Implications for teaching are discussed.

INTRODUCTION

University educators are capitalizing on the social nature of Web 2.0 technology so as to create an optimal environment for learning (Hung and Yuen, 2010), given that today's students learn about computers, software and network technologies at an early age. Those students are primarily "digital natives" (Prensky, 2001) who are comfortable with technology even before they enroll in their first university course. The higher education community has made great strides in utilizing technology infrastructure, partly because of their belief that Web 2.0 technology has enormous potential to shape the way humans learn (Bosch, 2009; Ractham, Kaewkitipong, & Firpo, 2012). The pedagogical implications of technological advancement, however, remain vastly unexplored (Hemmi, Bayne, & Land, 2009).

Social networking media, including Facebook, are gradually and steadily transforming education and the way most subjects are taught. Because social media are interactive, those participating in it can create, edit or share information. Unlike traditional one-way media such as television, social media are two-way conversations in which control is decentralized and open to masses of users (Barczyk & Duncan, 2012). Consequently, faculty are becoming less the authoritative deliverers of knowledge and more the facilitators of exploration and collaboration in pursuit of answers, opportunities and solutions to problems. Some higher education faculty view Facebook and other social media as a way to motivate and engage students to be actively involved in their learning (Junco, Heiberger, & Loken, 2011).

Facebook has the potential to become an exciting instructional tool given its popularity and students' familiarity with its site. In fact, it has the potential to influence students in the United States and globally.

Because 80% of Facebook's 1.32 billion monthly active users live outside the United States (Facebook, 2014), it represents a global, engaging information-sharing mechanism that can facilitate critical thinking and intercultural dialogue (Maher & Hoon, 2008). Research suggests that Facebook's focus on peer-to-peer interactions enhances informal learning experiences (Goodwin, Kennedy, & Vetere, 2010; Madge et al., 2009; Selwyn, 2009). Other studies have shown that students have effectively used Facebook for learning and activism (Bosch, 2009; Grosseck, Bran, & Tiru, 2011).

A number of research studies demonstrate that faculty members have effectively used Facebook for academic purposes. Junco (2012) reports that faculty are using social media sites for course-related purposes and that usage is rapidly increasing. However, some college educators are hesitant to embrace Facebook as an instructional tool (Moran, Seaman, & Tinti-Kane, 2011; Roblyer, McDaniel, Webb, Herman, & Witty, 2010). A study by Kirschner and Karpinski (2010) reported that Facebook users had significantly lower grade point averages than non-users; and they spent fewer hours per week engaged in study compared to non-users. In sum, the current research suggests that Facebook is a promising, but not a perfect, educational tool that warrants further application and study.

The purpose of this paper is to discuss the results of a study designed to determine whether the incorporation of Facebook into the instructional design of business courses has an impact on students' attitudes and perceptions of those courses. Specifically, students' general perceptions of using social networking media in Facebook-enhanced courses will be compared to students' perceptions in non-enhanced courses. Additionally, whether or not students in Facebook-enhanced courses perceive a different sense of classroom community (SCC) from those in non-Facebook-enhanced courses will be analyzed.

Organizationally, this paper is divided into four parts. The first reviews the literature and presents a statement of two research questions. The second describes the method used to address the research questions and begins with a description of how the Facebook-enhanced courses were designed. The third summarizes the results associated with the research questions. The fourth part discusses the findings of this study and their implications.

REVIEW OF THE LITERATURE AND STATEMENT OF RESEARCH QUESTIONS

Attitudes Toward Using Facebook in the Classroom

Relatively few studies have researched the potential of web-based technologies to engage students in higher education (Hurt, Moss, Bradley, et al, 2012). Prior research has suggested that investigators should examine how the features of Facebook help build classroom community. An analysis of students' attitudes toward the use of Facebook in the classroom could serve as the building block. On that foundation research questions could be designed to determine whether Facebook is (1) perceived as a convenient medium for interaction, (2) a contributor to course quality, (3) a mechanism to foster professional growth, and (4) a facilitator of classroom participation.

Ractham, Kaewkitipong and Firpo (2012) used Facebook as a learning tool in an introductory management information systems course to build and foster an enhanced learning environment. They used the social interactions among Facebook-connected students to develop a constructivist learning atmosphere. A variety of pedagogic strategies were used to integrate activities both inside and outside of the classroom to achieve social learning. The authors sought to implement and evaluate several features of a social networking technology, i.e. Facebook, in attempt to enhance communication and collaboration and other innovative uses in future classes. The four features they activated were (1) Social playground through Facebook Wall, (2) Social discussion through Facebook Discussion, (3) Social roll call through Facebook Photos, and (4) Social tube through Facebook Videos.

Seventy five students participated in the Ractham, Kaewkitipong and Firpo (2012) study, which resulted in 55 completed, usable questionnaires. It was found that 55% of the students felt that Facebook helped them in learning. Even more, 78% felt that Facebook was a useful supplemental learning tool. The high volume of communication between students and the overall positive responses to the survey led to the conclusion that there was great potential for informal learning environments with Facebook as the

primary space to communicate and collaborate. The authors observed that some students participated in a casual manner in the same way they would casually interact with friends on their personal Facebook accounts.

Among the lessons learned by Ractham, Kaewkitipong and Firpo (2012) were that Facebook usage in the classroom is time consuming for instructors, yet it is important to communicate frequently with students in order to maintain a high level of interest and activity in the overall learning environment. They also learned that the Facebook effect was somewhat dependent on the instructor's skills, personal characteristics and willingness to commit the time needed. Faculty need to provide structure in spite of more focus on learner centeredness.

deVilliers (2010) studied the potential of Facebook group and discussion facilities for focused academic use. In a study of 35 postgraduate distance-learning students who joined an optional Facebook group to discuss academic content, it was found that learning and perceptions were enhanced by participating in the discussions. The students benefitted from contact with fellow online students; they especially benefitted by researching beyond the assigned study materials and by making personal contributions.

A study of the attitudes of 107 students toward Facebook provides some insights. In a survey designed to compare the attitudes and perceived learning between Facebook and eLearning Commons (a Blackboard Learning Management System tool), Hurt, Moss, Bradley, et al (2012) found that:

1. Facebook was preferred over eLearning Commons as a classroom supplement. Many of the students were already familiar with Facebook, used it frequently and found it easy to navigate.
2. Facebook users became more acquainted with their classmates.
3. Facebook users felt like valued participants and learned more course material.
4. If used appropriately, Facebook may help to increase student engagement by cultivating classroom community and stimulating intellectual discourse.

In sum, Facebook can be used effectively for academic discussions.

Based on these studies indicating that students had favorable attitudes toward social media-enhanced courses, we advance the first research question:

> *RQ 1. Is there a difference in the attitudes of students in Facebook-enhanced courses and those in non-enhanced courses on whether Facebook (1) is convenient to use in the classroom, (2) enhances the quality of courses, (3) fosters professional growth, and (4) increases classroom participation?*

Sense of Classroom Community

According to Rovai (2002b), a *classroom community* is a "feeling that members have of belonging, a feeling that members matter to one another and to the group, that they have duties and obligations to each other and to the school, and that they possess shared expectations that members' educational needs will be met through their commitment to shared learning goals" (p. 322). Rovai (2002b) contends that classroom community consists of two factors. The first is learning, which is "the feeling that knowledge and meaning are actively constructed within the community, that the community enhances the acquisition of knowledge and understanding, and that the learning needs of its members are being satisfied" (p. 322). The second is connectedness, which is "the feeling of belonging and acceptance and the creation of bonding relationships" (p. 322). A strong classroom community demonstrates characteristics such as shared common interests, active engagement in two-way communications, and trusting and helping other members (Rovai, 2002b).

Social media such as Facebook, Google +, MySpace and others are designed to facilitate social interaction and information exchange. A number of researchers believe that social networking is the life blood of a classroom community. Among those researchers are Mason and Rennie (2007) who incorporated several forms of social media to support a local community's development of a land trust. They found that social media supporting social interaction increased the emotional connectedness of community members, which facilitated to the development of the land trust. Russo, Watkins, and

Groundwater-Smith (2009) believed that social media, specifically MySpace and podcasts, created knowledge-sharing, which led to informal learning.

Social media, especially Facebook, has the capacity to enhance student engagement and satisfaction. In a study by deVilliers (2010), Facebook groups were used to foster optional discussions in an online course. She found that the voluntary Facebook group members benefited in the course by critically thinking about required material and contributing to the online discussion. In another study by Schroeder and Greenbowe (2009), undergraduate students in a basic organic chemistry laboratory participated in an optional, out-of-class Facebook discussion group. Students who participated in the Facebook discussion group posted items more frequently and dynamically than those in the official course website.

Barbour and Plough (2009) analyzed the pedagogical use of social media in an online program at a charter high school. The high school attempted to increase students' SCC by incorporating technologies such as Facebook, Ning, and others. Incorporating social media into the blended learning courses at the charter school enhanced students' learning experiences, and was found to be effective and well-regarded by faculty as well as students. This body of research suggests that social media enhance the learning experience and student engagement in various learning communities – professional, informal, and online.

Based on these studies indicating that social media affects students' learning and engagement, we advance the second research question:

> *RQ 2. Is there a difference between students in Facebook-enhanced courses and those in non-enhanced courses in terms of their sense of learning and sense of connectedness?*

METHOD

Description of the Facebook-Enhanced Course – Experimental Group

Students at two universities in California and Indiana were encouraged to voluntarily participate in the Facebook component of four different business courses. The courses were accounting, business law, human resource management, and organizational staffing. While the subject matter in these courses was different, the classroom style and teaching philosophy of the instructors were similar. Both used a participative, student-focused, collaborative approach to teaching.

The instructors agreed on a uniform teaching protocol so that presentation of the courses was consistent and similar. Thus, course design and instructor differences were minimized. Only students registered for the course were allowed to access the Facebook group page. This protected privacy and provided an environment conducive to postings and the general use of Facebook. What follows is a description of how Facebook was integrated into the instructional design of the business courses. All courses used Blackboard as there official course management system and Facebook was employed as an instructional supplement and the experimental intervention.

Students were assigned a term project in their respective courses and worked in teams, usually comprised of four members. The project was a required element of the course. Teams using Facebook held virtual meetings, posted YouTube links and research findings relevant to the team project and commented on one another's works. Initially some students were quite unfamiliar with social media technology, but as the course evolved, they became more comfortable with using Facebook. Some students needed reassurance that their postings were private and would only be viewed by members of the class. They also needed reassurance about the security of the information posted, because while they had no objections to sharing thoughts and opinions in a classroom, they did not want those ideas revealed to employers, outsiders, or even Facebook "friends."

It appeared that Facebook, more so than BlackBoard, facilitated student interactions and had a positive influence on their senses of learning and connectedness. Students in some teams used Facebook for other course work and discussions, even beyond their assigned projects.

After about six weeks, the semblance of a learning community became apparent when students started asking questions on Facebook about the upcoming examination, quizzes, holiday break, and deadlines for the submission of their term project. Fellow students who knew the answers to many questions felt

comfortable posting a response, which created open dialogue. This was advantageous because sometimes students posted a response before the question was seen by the professor. For example, there was one situation where the professor posted an announcement on Blackboard, but because of a system failure, a majority of the students in the course were unable to see it. One student who saw the Blackboard announcement posted it to the group Facebook page and the information was effectively disseminated immediately to all the students in the course.

As the course progressed, both students and instructors became increasingly comfortable posting YouTube videos, comments about course-related events on campus, and summaries of material related to the term project. Class participation grew in terms of volume and quality. A review of the times during which material was posted indicated that students' interactions and engagement went beyond their classrooms and scheduled class meeting times.

Students in the control group were enrolled in non-Facebook-enhanced courses. As such, they were not exposed to the experimental intervention. All other aspects of their courses mirrored those in the experimental group.

Students who participated in the Facebook and non-Facebook-enhanced courses were encouraged to complete a paper-based questionnaire, which was designed to assess their course experiences.

Survey Instrument

The questionnaire consisted of 52 closed and open-ended items. To assess students' attitudes toward the use of Facebook in the classroom, eight questions were constructed. They related to whether Facebook (1) was convenient to use in a course, (2) enhanced the quality of a course, (3) facilitated professional growth, and (4) increased students' classroom participation. Students responded to these questions as five-point Likert-type items where 1 represented strong disagreement and 5 represented strong agreement.

To assess SCC, a series of questions from Rovai's (2002a) Classroom Community Scale was adopted. Ten questions that have been validated in other studies (Hung and Yuen, 2010; Black, Dawson, & Priem, 2008; Rovai, 2002a, 2003) were used to measure students' feelings of learning-oriented behaviors and their feelings of connectedness. Students responded to these questions as five-point Likert-type items where 1 represented strong disagreement and 5 represented strong agreement. Four questions were reverse scored. Analysis of the questionnaire was carried out such that higher scores on the 10 SCC questions reflected stronger senses of learning and connectedness.

The questionnaire for the control group was modified to preserve the essential content of each question, but to reflect the fact that students in the courses of that group did not participate in the Facebook intervention.

The questionnaire, which also assessed student demographics, was administered in a paper-and-pencil format.

Respondents

Respondents included 586 students from 22 face-to-face business courses at two public universities located in California and Indiana, USA. There were a total of 671 registrants in the courses taught by the authors of this paper. Students in those courses voluntarily participated in the survey, which was approved by the universities' Institutional Review Board. They completed the questionnaire anonymously.

Procedure

The study was conducted using a survey methodology in an independent measures static group comparison research design (Campbell & Stanley, 1963). "This is a design in which a group which has experienced X is compared with one which has not, for the purpose of establishing the effect of X" (Campbell & Stanley, 1963, p. 12). The incorporation of Facebook into the instructional design of the respective courses served as the experimental manipulation. There were two groups of courses, with the experimental group receiving the Facebook intervention. The courses in the control group had identical content but did not have the Facebook intervention. During the last week of classes, students in the

Facebook-enhanced courses (experimental group) and in the non-Facebook-enhanced courses (control group) were surveyed. Each student received a paper questionnaire and was informed that completion of the survey was voluntary and would not affect her/his course grade. Each student was also informed that all data collected would be maintained anonymously. Students completed the questionnaire in approximately 12 minutes.

RESULTS

Respondent Characteristics

There were 586 respondents to the survey, of which 303 had participated in Facebook-enhanced business courses and 283 had participated in non-Facebook-enhanced business courses. The study consisted of 297 (50.7%) males and 288 (49.1%) females. One respondent failed to indicate gender. The data on age were categorized into two groups: 25 years old or less and more than 25 years old. Three hundred seventy six respondents (64.1%) were between the ages of 18 and 25, while 207 respondents (35.4%) were over the age of 25. Three respondents failed to indicate their age. The majority of respondents ($n = 480$) had previous experience with online education (81.5%). Similarly, a majority ($n = 508$) were full-time students (86.2%). In terms of class level, the majority of respondents (87.5%) were upper division students and 11.7% were lower division undergraduate students. Table 1 summarizes the characteristics of respondents.

TABLE 1
CHARACTERISTICS OF THE RESPONDENTS

Variables*	N	P	N	P
Groups	Experimental 303 (51.7%)		Control 283 (48.3%)	
Gender	Males 297 (50.7%)		Females 288 (49.1%)	
Age	18 to 25 376 (64.1%)		≥ 26 207 (35.4%)	
Program status	Full time 508 (86.2%)		Part time 78 (13.2%)	
Class level	Upper division 516 (87.5%)		Lower division 69 (11.7%)	
Online course experience	Yes 480 (81.5%)		No 106 (18.0%)	

Note for Table 1:
* Because some respondents did not answer all of the survey questions,
  percentages for some variables do not add up to 100%

First Research Question – Attitudes toward Facebook

　　Table 2 summarizes the data associated with the questionnaire items designed to measure the attitudes of students in Facebook-enhanced (experimental group) and non-enhanced (control group) business courses. The table shows the mean and standard deviation for eight attitudinal questions to which students in the experimental and control groups responded. It also shows the results of the t-tests employed to determine whether there was a statistically significant difference between the means of each attitudinal item for the experimental and control groups. Levene's test of equality of variances was performed on each item and revealed significance levels less than .05. This indicated that the assumption of homogeneity of variance should be rejected. As such, the independent sample t-tests performed in this study assumed unequal variances between the group means for each of the eight attitudinal items.

TABLE 2
STUDENTS' RATINGS ON QUESTIONS ASSESSING THEIR
PERCEPTIONS OF FACEBOOK USAGE

Questions [a]	Experimental [b]		Control [b]		df	t
	M	*SD*	*M*	*SD*		
Facebook for classroom discussions is very convenient	3.57	(0.99)	2.93	(1.18)	549	7.07[***]
Facebook improved the quality of my course	3.17	(0.97)	2.72	(1.08)	565	5.30[***]
Facebook should be introduced in more courses	3.30	(0.93)	2.79	(1.17)	536	5.82[***]
Facebook was more effective than Blackboard	2.86	(1.13)	2.53	(1.19)	578	3.46[***]
I preferred using Facebook over Blackboard	2.94	(1.15)	2.51	(1.25)	566	4.39[***]
I felt more connected to fellow students using Facebook	3.39	(0.99)	3.01	(1.28)	528	4.02[***]
I acquired personal or professional growth using Facebook	3.81	(0.82)	3.90	(0.85)	579	1.33
Facebook enhanced my experience of participation in this course	3.81	(0.76)	3.76	(0.83)	565	0.73

Notes for Table 2:
[a] Rated using five-point Likert-type items where 1 = strongly disagree, 5 = strongly agree
[b] $N = 303$ for the experimental group; $N = 283$ for the control group
[***] $p < .001$

The data in Table 2 indicate that students in the experimental group, compared to those in the control group, felt significantly more positive toward Facebook. They thought it was convenient for classroom discussions, a way to improve the quality of their course, and an improvement that should be introduced in more courses. They thought it was more effective than Blackboard and preferred using it over Blackboard. Students in the experimental group felt more connected to fellow students using Facebook than those in the control group. However, there was no significant difference between the experimental and control group students on the issues of professional growth and enhancement of participation. Students exposed to Facebook did not perceive that they experienced more personal or professional growth than students in the control group. Similarly, students in the Facebook-enhanced courses did not perceive that they engaged in more class participation than those in the non-Facebook-enhanced courses.

Overall, students' attitudes on the convenience of using Facebook and its ability to add quality to their courses was positive and significantly greater for the experimental group, as compared to the control group, whose students did not participate in Facebook-enhanced courses.

Second Research Question – Sense of Classroom Community: Learning and Connectedness
Table 3 summarizes the data associated with the questionnaire items designed to measure students' perceptions of the SCC in their Facebook and non-Facebook-enhanced business courses. The table shows means, standard deviations, and percentages associated with the sense of learning and sense of connectedness items for the experimental and control groups. It also shows the results of the t-tests that helped determine whether there was a statistically significant difference between the means for the SCC items in the experimental and control groups. Levene's test of equality of variances was performed to determine whether the significance levels were greater than .05. If so, an independent sample t-test was performed assuming equal variances between the means for the respective SCC item. If the significance level of Levene's test was less than .05, the independent sample t-test was performed assuming unequal variances between the means for the respective SCC item.

The data indicate that there was a statistically significant difference between the experimental group ($M = 19.41$) and the control group ($M = 20.09$) associated with the composite scale for sense of learning ($t = 2.27$, $df = 581$, $p < .05$). There was no difference between groups for the composite scale associated with sense of connectedness. What is counterintuitive is the direction of the differences for sense of learning. The students in the control group, who did not participate in the Facebook-enhanced courses, actually experienced a greater sense of learning. While not statistically significant, students in the experimental group ($M = 16.46$), as contrasted with those in the control group ($M = 15.94$), experienced a greater sense of connectedness. The students in the experimental group participated in Facebook-enhanced courses.

There was a statistically significant difference between the means for the experimental and control groups for two of the 10 items associated with students' SCC. Students in the experimental group had a significantly lower mean score ($M = 3.80$) than those in the control group ($M = 3.95$) on the sense of learning item that read "I am given ample opportunities to learn" ($t = 2.10$, $df = 577$, $p < .05$). However, students in the experimental group had a significantly higher mean score ($M = 3.24$) than those in the control group ($M = 3.04$) on the sense of connectedness item that read "Students in this course care about each other" ($t = 2.71$, $df = 577$, $p < .01$). There were no statistically significant differences between the experimental and control groups for the remaining eight SCC items. These findings provide only minimal support for the hypothesis that Facebook-enhanced courses facilitate students' sense of learning and sense of connectedness.

TABLE 3
**STUDENTS' RATINGS ON QUESTIONS ASSESSING THEIR SENSE OF
CLASSROOM COMMUNITY**

Questions [a]	Experimental [b]		Control [b]			
	M	*P* [c]	*M*	*P* [c]	*df*	*t*
Sense of Learning						
Composite Scale	*19.41 (3.50)*		*20.09 (3.74)*		*581*	*2.27[*]*
I am encouraged to ask questions	3.78 (0.93)	66	3.88 (0.94)	71	574	1.32
Is not hard to get help when I have a question [d]	3.98 (0.87)	78	4.12 (0.93)	79	572	1.88
My educational needs are being met [d]	3.95 (0.92)	74	4.09 (0.99)	74	570	1.84
I am given ample opportunities to learn	3.80 (0.82)	71	3.95 (0.90)	76	577	2.10[*]
Course promotes a design to learn [d]	4.01 (0.91)	75	4.13 (1.00)	76	566	1.52
Sense of Connectedness						
Composite Scale	*16.46 (3.26)*		*15.94 (3.89)*		*552*	*1.72*
Students in this course care about each other	3.24 (0.87)	37	3.04 (0.95)	28	577	2.71[**]
This course is like a family	2.76 (1.01)	31	2.61 (1.05)	18	576	1.71
I do not feel isolated in this course [d]	3.88 (0.91)	68	3.93 (1.02)	69	579	0.63
I can rely on others in this course	3.14 (1.01)	39	3.12 (1.07)	39	577	0.26
Others will support me	3.49 (0.87)	52	3.39 (0.92)	44	578	1.44

Notes for Table 3:
[a] Rated using five-point Likert-type items where 1 = strongly disagree, 5 = strongly agree
[b] N = 303 for the experimental group and N = 283 for the control group
[c] Indicates the percentage of respondents who agreed or strongly agreed with this item
[d] Reverse scored question, framed positively in this table
[**] $p < .01$
[*] $p < .05$

DISCUSSION

Two Research Questions

This article discussed the results of two research questions aimed at determining whether Facebook had an effect on students' attitudes and SCC when it was integrated into the instructional design of their university level business courses. In the first research question, we examined whether students perceived that the classroom use of Facebook was convenient, added to the quality of their course, facilitated professional growth, and enhanced their classroom participation. Facebook, the most globally popular social networking site, served as the classroom intervention in a study using a static group comparison research design. Students were assigned to one of two groups. In the experimental group students participated in the Facebook intervention. In the control group students did not participate in the intervention. Overall, there were significant differences between the experimental and control groups on the issue of students' attitudes toward the use of Facebook in their courses. Students participating in the Facebook-enhanced courses reported that Facebook was a convenient and quality-oriented supplement to their traditional on-campus courses. This finding is consistent with the work of Hurt, Moss, Bradley, et al

(2012). Students did not perceive that using Facebook in the classroom had any impact on their professional growth or ability to participate more effectively in their courses.

In the second research question, we examined whether students perceived the SCC in their Facebook-enhanced courses to be different from the SCC in non-enhanced courses. Statistically significant differences between the experimental and control groups were found for two of the ten SCC variables. In terms of students' sense of learning, there was a significant difference between the mean scores for the experimental and control groups on the composite scale. Students in the control group perceived a greater sense of learning than those in the experimental group. In other words, students perceived a greater sense of learning in their non-Facebook enhanced courses. This finding is contrary to the results of earlier studies, which were based on analyses of data from non-control group designs (Barczyk & Duncan, 2013) or on the analysis of a single activity such as posts to a discussion group (Schroeder & Greenbowe, 2009). It was initially believed that Facebook-enhanced courses resulted in students having an increased sense of learning. The data from this study shows just the opposite, that Facebook-enhanced courses do not increase students' sense of learning.

Overall, students in this study perceived no benefit from adding Facebook to their courses in terms of their sense of connectedness. There was no difference between the mean score of students in the experimental group and the control group on the composite scale for sense of connectedness. Only one item indicated that students in Facebook-enhanced courses felt that their classmates cared about each other. There was a statistically significant difference between the means of the experimental and control groups for this item, which revealed that Facebook had a positive effect on students' sense of connectedness in terms of their caring more about each other when Facebook was incorporated into the instruction design of their course. The results associated with this single item are consistent with those of Junco, Heiberger, & Loken (2011) who found that when Facebook was used in the classroom students felt more engaged. Engagement occurs when students care about each other.

Implications for Teaching

This study stands for the proposition that Facebook-enhanced courses are perceived to be quality oriented and convenient to navigate. They are minimally associated with the enhancement of students' SCC. This has implications for teaching and learning. According to Junco (2012), students who have strong feelings of community are more likely to be engaged and persist in their studies (Rovai, 2002b) than students who feel alienated or alone. Instructional design strategies that help strengthen the sense of community in the classroom may help student learning, engagement, and possibly retention. The use of Facebook in courses appears to facilitate connectedness, but has a negative effect on learning.

By facilitating interaction and collaboration, Facebook may provide students with the opportunity to engage beyond their classroom periods. They should note, however, that supplementing a course with Facebook is time-intensive. Students may find that they are overloaded with the abundant information shared by instructors and classmates. As such, instructors should develop a strategic instructional plan and a structured mechanism for information sharing and interaction to manage their classrooms. In so doing, they can insure its effectiveness and resultant benefits.

When using Facebook for instructional purposes in higher education, instructors should respect students' need for privacy and information security. As students are introduced to Facebook in their courses, a concerted attempt should be made to limit outsider access to group pages. Only students registered for the course should be allowed to access the group Facebook page.

Until the instructional efficacy of social media is documented in further research, instructors should use prudence in enhancing their courses with Facebook.

Implications for Further Research

This study documented the effect of social media on students' perceptions of convenience, quality, and to some extent, on SCC. These findings are more robust because they examined the Facebook intervention against a control group. The research design was improved compared to earlier studies, which increases the level of confidence in the results obtained. However, this study was based on self-

reported subjective measures. Future research should be designed to go beyond measures of attitudes and perceptions. Studies should measure the extent to which Facebook and other social media impact actual learning outcomes and student performance. These objective measures would provide additional insights into the pedagogical value of social media.

Limitations

This study has two potential limitations. The first relates to its use of a single survey instrument, which could result in a common method bias. Notwithstanding, this method was used to collect the survey data because of its efficiency and overall economy. Future research should use additional methods for collecting data such as interviewing or focus groups. This would buttress survey results and lessen the threat to validity occasionally observed in educational research that uses a single data collection instrument (Donaldson & Grant-Vallone, 2002). The second limitation relates to this study's reliance on self-report measures. This has the potential of creating a social-desirability bias, which occurs when respondents answer survey questions in a manner that makes them look favorable. Given that the student respondents completed the questionnaire anonymously, the probability that using self-report measures influenced the outcomes of the study is very low.

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