Social Networking Sites as Formal Learning Environments in Business Education

Abida Ellahi

Fatima Jinnah Women University, Rawalpindi, Pakistan // abia.ell@gmail.com

ABSTRACT

The central objective of this study is to investigate the extent to which social networking sites can affect learning effectiveness, and to what amount this technology can be used as supplementary elements for existing pedagogy methods prevailing in a developing country. The study used a teaching case research method to investigate the effects of Social Networking Sites (SNS) usage on learning outcomes of students in higher education setting in Pakistan. The central hypothesis developed in this study was that, using social networking sites in higher education enhance students' interest, which ultimately increases their satisfaction and perceived learning performance. These effects are further boosted in the presence of instructor's support. The results confirmed that Social Networking Sites (SNS) hold a place in teaching and learning in higher education. The study provides a way to maximize the impact of the existing technologies, by providing an understanding of how the different technological tools and learning can impeccably be incorporated in higher education.

Keywords

Social Networking Sites, Business education, Satisfaction, Performance, Instructor's support

Introduction

Instructive technology is in vogue and the recent types of innovation in education have given various chances to scholastic and professional foundations for adopting new forms of learning beyond conventional instruction. The elements found for the most effective learning environments are problem-based learning, collaborative learning, demonstration and application of new knowledge, integration of new knowledge into the learners' world and assessment of the learning process as well as learners' progress etc. (Rogers, 2007). The adoption of technologies by academia across the world has reshaped the existing paradigm by bringing the potential solutions for all learning problems. Educational technology has become increasingly common in academia, and governments are spending billions to give academia access to the technology. However, research on the usefulness of using educational technology has lagged in higher education sector. These technologies are not just limited to the use of internet for online literature searching; instead it has moved to the new horizon of web 2.0, digital games, digital badges, learning management systems etc. The technology improves the efficiency and the effectiveness of academic institutional processes in the form of cost and time savings and increases the interaction between institutions and their learners.

The chronicled background of using informational advancement in Pakistan is very recent. Regardless of a few government endeavours, the use of instructive innovation in the nation is still in early stages and it has not achieved its maximum capacity yet. For this country's case, where there are very few learning technologies existing, normative studies are required to contribute to the understanding and importance of technology management in educational institutes. Since normative studies contribute by bringing new situations that had not been previously investigated. The main problem addressed by this study is the lack of technology usage in higher education of Pakistan. This problem exists because teachers in higher education do not have enough access or exposure to innovative technologies to help them in truly constructing innovative teaching methods. It is, likewise, the need of great importance to recognize what sort of innovation interceded environment works best for learners and what steps ought to be taken to actualize the change. Similarly, it is also necessary to know that how can curriculum areas make use of emerging as well as established technologies to improve students' interest, engagement, retention and achievement. Hence, careful thinking and research is needed to find the best way to leverage the emerging digital technologies to boost teaching and learning activity.

This study aims to investigate the extent to which new learning technologies like social networking sites can affect learning effectiveness in Pakistan, and to what extent these technologies can be used as supplementary elements for existing pedagogy methods. For this purpose, social networking site has been tested in business education studies. The study arrangement was intended to evaluate the learning satisfaction and perceived learning performance of business graduates with moderating role of instructor's support because of the utilization of instructive innovations like social networking sites for learning.

Literature review

The efficacious usage of information and communication technologies (ICTs) is not only reliant on the properties of the technology but it must fit in with the social environment in which it is planned to be used (Matzat, 2009). Social networking Sites (SNS) have been used by people as the mainstream communication method to connect with the world including family and friends. It can be considered as one of the paramount way to stay in touch with the members of a society. Academia across the world has not adopted the internet technologies at the same rate. Where some educational institutions have been slow, others have warmly welcomed such technological advancement. The emerging and growing form of internet technologies such as social networking websites or web 2.0, have paved a way to build virtual communities that offer teachers, students and their parents to make real-time interactions.

Social networking websites have been widely accepted by organizations, public, politicians, and media companies. Chu and Du (2013) found that various libraries in academia, adopted SNS to support their work such as for publicity, interacting with library members, and enhancing reference services. Caldwell (2015) claimed that there has been very little research on the usage or potential of using SNS in teaching and learning. Many previous researchers found that SNS had been used by the students only for social purposes. For example, in his study, Stern and Taylor (2007) and Zhao, Grasmuck, and Martin (2008) found that social networking sites have been used by the students to make new friends, send messages and view pictures etc., and later researchers for example, Sanchez, Cortijo, and Javed, (2014) found that students also use social networking sites to share study notes and discuss about the course material and work. In a study conducted by Barczyk and Duncan (2013), students confirmed that "Facebook enhanced their experience of participation in their course" (p. 6).

Constructivism Theory and Social Networking Sites

Constructivism theory argues about providing a learning context in which the learner feels himself in a situation like the one in which he is going to apply the knowledge (Ahdell &Andresen, 2001). It emphasizes on understanding rather than memorizing facts. Lave (1993) argues that in this way, learner constructs, interprets and acts upon the facts being learnt, thus turns out into an enhanced understanding. Socio-culturism approach of learning (Brown, Collins & Duguid, 1989) also argues that learning is enculturation, the process by which the learners become collaborative meaning makers among a group defined by common practices, language, use of tools, values and beliefs. It emphasizes that context around the learning situation is important for effective learning. These theories also support the use of social networking websites (social learning).

Social software support the social constructivist approach to networked learning by providing learners with personal tools that can engage them in social networking (Alexander, 2008). These networking tools enable learners to interact and collaborate in a virtual community during learning activities (Munguatosha, Muyinda, & Lubega, 2011). Due to the personalized and independent learning with respect to place and time, learners are actively involved in the learning activities (Kruger, 2010), thus, it enhances social motivation and interest for students to read and contribute through online discussions. (Walsh, 2010). McLoughlin and Lee (2010) discussed social networking software as a pedagogical choice. They commented that social software facilitates active participation, learner self-direction, and personal meaning construction which is core theme of social constructivism, thus, social software can be applied for teaching.

Theoretical relationships among variables

Learning outcomes

Measuring or determining learning outcomes or effectiveness is a critical part of any learning process. Moody and Sindre (2003) comprehensively defined the two approaches of learning effectiveness which are performance based and perception based assessments of learning. Learning performance is commonly associated with a more positive attitude toward the environment, namely, courses and teachers (Duke, 2002). In this study, students' perception of satisfaction and perceived learning performance have been taken as dependent variables.

Learning satisfaction and social networking websites

Learning satisfaction in the context of technology infused learning, is the individual's feelings and experience of learning environment after instruction; hence, it is individual's joyful feelings or positive attitudes (Lee, 2009). The increasing competitive environment for higher education cross the world has brought up students' satisfaction a key indicator of academic institutes' effectiveness. Just as low student satisfaction has implications, high student satisfaction can impact a host of outcomes, particularly student retention, student academic success, and social connectedness (Powless, 2011) and institutions' quality assurance. Al-Rahmi and Othman (2013) investigated students' satisfaction using social media in higher education and found that in social media interactivity with the teachers, engagement, perceived ease of use, perceived usefulness, interactivity with peers all affect to shape students' satisfaction in higher education. Hence, it can be hypothesized that H_1: Use of social networking sites for learning significantly affects learning satisfaction of students.

Perceived learning performance and social networking websites

According to DeLone and McLean (2002), a successful system impacts individuals by bringing an improvement in their productivity, a change in their operations, as well as a change in understanding the importance and usefulness of the organization's system. This concept is also captured as perceived individual impact variable which refers to the impact of an information system usage on individual performance of person within his work environment. Helou and Rahim (2014) made an attempt to investigate students' perceptions about the influence of social networking sites on their academic performance in a Malaysian university. The respondents of their study agreed upon the positive influence of social networking sites on their academic performance. Mehmood and Taswir (2013) explored academic effects of social networking sites on undergraduate students in Oman. They found a significant effect of social networking sites on academic performance of students in Oman. Hence, it can be hypothesized that H_2: Use of Social networking sites for learning significantly affects perceived learning performance of students.

Learner's interest and social networking sites

Effective learning always requires students' engagement in the learning process as the degree of engagement increase the individual learning outcomes improve as well (Admiraal, Huizenga, Akkerman, & Dam, 2011). Though "individual interest and intrinsic motivation are two separate constructs, they predict similar outcomes in that they both create and sustain a deepening involvement with content and affect over time" (Park, 2012. p. 105). Imlawi, Gregg, and Karimi (2015) argued that although engagement is a significant factor of social networking acceptance, fewer studies have been carried out on the impact of social networking on student's engagement and perceived educational outcomes. In their study, they found that "instructors who create course-based online social networks to communicate with their students can increase their engagement, motivation, and satisfaction " (p. 84). Junco, Heiberger and Loken (2011) also observed that despite an increasing use of social media in education, there is very little research focusing on the effect of social media on students' interest in higher education. In their controlled experimental study, they used Twitter as tool of social media and found that Twitter usage in an academic way for learning can increase student engagement and their learning performance. They further found that not only students but teachers also become highly engaged when they interact via social media. Hence, social media is an effective educational tool to help student bring the desired results. Hence, it can be hypothesized that:
H 3 (a): Learner's interest mediates the effect of use of social networking sites on learning satisfaction of students.
H 3 (b): Learner's interest mediates the effect of use of social networking sites on perceived learning performance of students.

Moderating variable: Instructor's support in social networking websites

To effectively utilize social networking sites in higher education, Smith (2007) suggested teachers to use popular social networking resources as an extension of the class. He further argued that "by gaining access to social networks in which students are comfortable and already established, connections with those students can be cultivated and developed to facilitate the engagement of students." (p. 13). Research illustrates an association between academic performance and informal communications between a student and teacher (Terenzini, Pascarella & Blimling, 1999). Mazer, Murphy and Simonds (2007) also indicated that teacher openness via

social networking sites can improve classroom environment and can increase students' motivation; thus, affecting their learning outcomes. Mirabolghasemi and Iahad (2013) observed that the great potential of social networking sites for learning have been ignored and little attention has been paid to educational benefits of social networking sites. Thus, it has been hypothesized that:

H 4 (a): Perceived instructor's support moderates the relationship between use of social networking websites and learning satisfaction of students.

H 4 (b): Perceived instructor support moderates the relationship between use of social networking websites and learning performance of students.
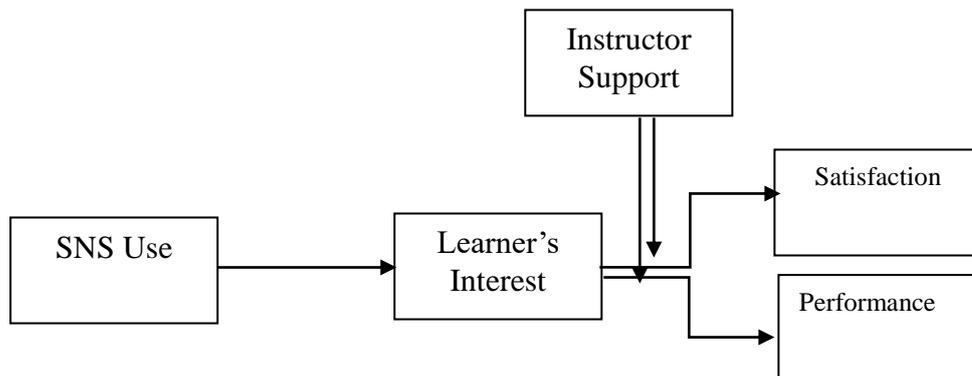
The proposed research model is shown in Figure 1.

Figure 1. Proposed research model

Research method

Methodologically, this study falls within the broad framework of case study method. Aaltio and Heilmann (2010), a case study is a "special research strategy and approach that can use either qualitative or quantitative data, or even combinations of them" (p. 65). This study represents a teaching methodology case in a university setting. Brem (2010) highlighted the importance of teaching cases as "Nevertheless, teaching cases offer a highly effective method for including students in the learning process and making a transfer between theory and practice. More research is needed regarding the success factors of teaching outlines, moderators, and group sizes" (p. 77). This study used a quantitative single case research in a university classroom. Boyer (2010) in an encyclopedia of case study research described that "quantitative single-case research is an experimental design that can be conducted with one subject or an entire group treated as a subject. The quantitative single-case research design (QSCRD) is relevant to case study research because it is a strategy used to identify a causal relationship between variables for one subject or individual subjects" (p. 757).

Study setting

There has been a growing emphasis on educational technologies for learning and teaching. Although the learning technologies like Web 2.0 and digital games etc. are promising in nature, most of the universities and colleges have not yet adopted these technologies in Pakistan. For a learning activity in University, where assignments are submitted online or typed on a computer, and soft copies of online notes and slides are prepared, a consolidated platform is required where all the learning material can be kept in one place for easy access. As a teacher, researcher of this study felt that her University lacked a learning management system. Teacher and students usually used yahoo or google groups for sharing assignments and notes. Although these groups facilitated the interaction but they also have numerous limitations. Secondly, it was also a common observation that students or young generation now spend more time on social networking websites due to their interactive features. It was also observed that due to large number of class students in a single course, every student does not have an equal access to participate in the class or to communicate with the teacher. Most of the communication was held via a focal student who is a class representative and has a regular contact with the teacher. Communication outside the class through only a single person created many problems. Thus, affecting students' learning satisfaction and performance. At the University level, there was no platform or communication medium that could equally involve all the students in communicating with teacher at the same time. The lack of a technological system posed a need to establish or set one that can aid in both teaching and learning process in a course. After

searching, it was easy to set up a social networking site that could connect a class group not only during class but also beyond the class walls.

Edmodo: The SNS platform

It was planned to adopt a social network site to address the above-mentioned problems. After careful evaluation, Edmodo was chosen to be implemented in the course. This author was the course instructor and this was the first time when students in this department were given a supportive resource to enhance their learning. The study was conducted from February to June, 2015, from September to December, 2014 and from February to June 2015 in three consecutive semesters at a public-sector university. The participants in this study were students enrolled in an undergraduate and graduate level courses of "IT in Business and Computing Skills for Management" (as shown in Figure 2). The syllabus of these courses was oriented towards technology usage in business which meant that most of the activities of these two courses were web and computer based. The classes of these two courses were held in a lab room of the department, where students had access to computers and internet.
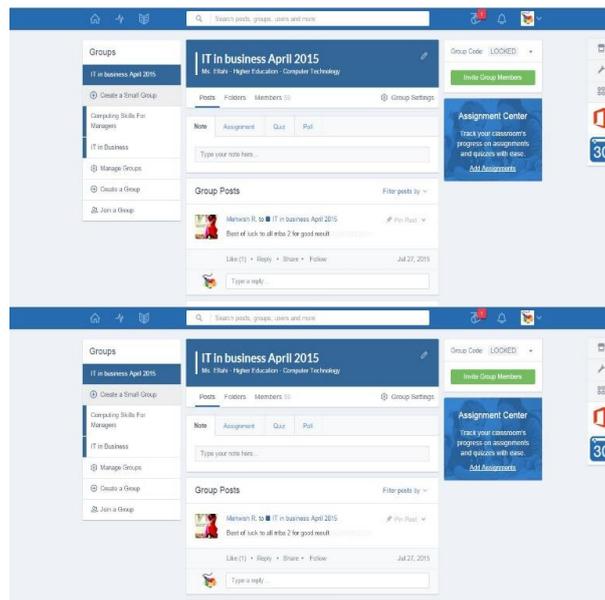

Figure 2. Screen shots of Edmodo

Procedure

At the beginning of each semester (from February 2014 to June 2015), the teacher integrated one course with Edmodo where students enrolled in that course were asked to register and join the online classes. In this way, the courses were blended with one to one teaching and with the online collaboration throughout each semester. To benefit from Edmodo, space for learner's centered exploration and discussion was created. Students were informed about the usage of this platform and were briefed about the assignments, quizzes and announcements made via this platform. Students were encouraged to share study related information to the group where other students could see, like and comment on it. Thus, a full collaborative environment was established where each student could see the other's progress anywhere by logging in to this network.

Data collection

After successfully running the SNS platform of Edmodo for three consecutive semesters, questionnaires (surveys) as a tool of data collection were distributed to the students to gather their perceptions and experiences of using the Edmodo platform. The questionnaire was basically employed to investigate the students' opinion towards Edmodo as well as to get their suggestions. This study adopted the measures used to operationalize the constructs included in the previous literature, making minor wording changes to tailor these measures to the current context. The questionnaires were refined through pre-testing. The pre-testing was focused on instrument clarity, question wording and validity. During the pre-testing, 10 users of the social networking sites were taken

as subjects and were invited to comment on the questions and wordings. The comments of these 10 subjects were taken as a basis for the revisions of construct measures.

Sampling

The general population for this study were students who use social networking websites. The sample from this population was drawn based on purpose or judgment i.e., to include those students who used Edmodo website as SNS platform for learning and education.

Table 1. Mean, standard deviation, alpha and correlation

	M	SD	α	1	2	3	4	5
SNS Use	2.363	.791	.92	1				
Learner Interest	2.535	.918	.92	.718**	1			
Learning Satisfaction	2.365	.894	.94	.825*	.775**	1		
Learning Performance	2.453	.825	.90	.834**	.775**	.880**	1	
Instructor's support	2.396	.802	.88	.577**	.555**	.578**	.636**	1

Note. Pearson Correlation, Sig. (2-tailed), $N = 127$; **Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed).

In this study, purposively or deliberately only those students were included for survey, who attended a course integrated with Edmodo platform. Total 150 students who were enrolled in those three courses in three semesters were selected. Questionnaires were self-administered to them which were filled by them anonymously. Out of 150, 127 useful responses were received that were analyzed for this study.

Results

Data was collected using a questionnaire based on previous research. The collected responses were analysed with the help of statistical tests using SPSS software.

Descriptive statistics

The statistical values in table 1 give information about means, standard deviations, alpha and correlations among the variables. The means and standard deviation values for SNS use were ($M = 2.3$, $SD = 0.79$), for learner's interest ($M = 2.5$, $SD = 0.918$), for learning satisfaction ($M = 2.3$, $SD = 0.89$), for learning performance ($M = 2.4$, $SD = 0.825$ and for instructor's support were ($M = 2.3$, $SD = 0.802$). Correlation is used to show the relationship between to variable. A Pearson correlation coefficient was computed to assess the relationships among the variables. The highest correlation was observed between variables learning performance and learning satisfaction ($r = 0.880$, $p = .000$) and the lowest correlation was observed between variables learner's interest and instructor's support ($r = 0.555$, $p = .000$). All correlations above 0.10 were significant at $p < .01$ level. All variables were significantly and positively related with other. The Cronbach alpha values, a measure of scale reliability are also given in Table 1. The alpha values for ten items variable SNS use were 0.82, for eight items variable learner interest were 0.92, for eight items variable learning satisfaction 0.94, for eight items variable learning performance 0.90 and for six items variable instructor's support were 0.88. All the values show excellent level of scale reliability.

Hypothesis testing

The Hypotheses were tested with the help of SPSS process Macro by Hayes and Preacher (2014). Hypotheses were constructed on the bases of theoretical background. To test the acceptance and rejection of the mediation hypotheses, regression using PROCESS macro model 4 was applied.

Mediation analysis

The statistical values shown in table 2 present the direct and indirect effect of independent variables on dependent variables. The values indicated that SNS use is a significant predictor of learning satisfaction and it

accounts for 93 units change in learning satisfaction ($b = 0.93$, t (125) = 16.33, p = .000). The results also confirmed that the effect of SNS use on perceived learning performance, ignoring the learner's interest was significant ($b = 0.86$, t (125) = 16.87, p = .000). In both cases, the SNS use was also a significant predictor of learner's interest which brought 83 units change in learner's interest ($b = .83$, $t(125) = 11.53$, p = .000).

The results of indirect effect or mediation analysis indicated the learner's interest as a mediator that was significantly related to learning satisfaction ($b = 0.48$, $t(124) = 8.58$, p = .000). It was observed that the effect of SNS use was reduced from $b = 0.93$ to $b = 0.53$ with the inclusion of learner's interest ($b = 0.53$, $t(124) = 8.13$, p = .000). Hence, partial mediation can be observed in this analysis.

In the context of learning performance, mediation analysis shows that the mediator (learner's interest) has significant effect on dependent variable (perceived learning performance). It showed that with the inclusion of the mediator, effect of independent variable, SNS use, on perceived learning performance was still significant. However, the intensity of the effect was lessened from $b = 0.86$ to $b = 0.59$. Hence, partial mediation can be observed in this analysis.

The results of Sobel test (Normal theory tests for indirect effect) also found mediation in the model for learning satisfaction ($z = 6.86$, p = .000) and ($z = 5.14$, p = .000) for learning performance. The indirect effects were also significant at the 95% level of significance, as indicated by the values of LLCI and ULCI when the lower and upper levels of the confidence intervals did not show zero. The partial mediation in both cases implies that there is not only a significant relationship between learner's interest and learning satisfaction as well as between learner's interest and learning performance, but also some direct relationship between SNS use and learning satisfaction as well as between SNS use and learning performance. Hence, Hypotheses H1, H 2, H 3 (a) and H 3 (b) have been accepted.

Table 2. Mediation analysis

	Predictors	β	SE	t	p
1	*Path a*				
	SNS Use --- Learner's Interest	.83	.072	11.53	.000
2	*Path b*				
	Learner's Interest --- Learning Satisfaction	.48	.056	8.58	.000
	Learner's Interest --- Learning Performance	.32	.056	5.76	.000
3	*Path c*				
	SNS Use ---Learning Satisfaction	.53	.065	8.13	.000
	SNS Use ---Learning Performance	.86	.051	16.87	.000
4	*Path C'*				
	SNS Use---Learning Satisfaction	.93	.057	16.33	.000
	SNS Use---Learning Performance	.59	.065	9.03	.000
	Bootstrap Results for Indirect Effect (Learning Satisfaction)	Effect	SE	LLCI (95%)	ULCI (95%)
	Learner's Interest	.3357	.0605	.2436	.4788
	Bootstrap Results for Indirect Effect (Learning Performance)	Effect	SE	LLCI (95%)	ULCI (95%)
	Learner's Interest	.2619	.0569	.1465	.3635

Note. Dependent Variable: Learning Satisfaction and Learning Performance, LL = lower limit; CI = confidence interval; UL = upper limit. N = 127; Unstandardized regression coefficients are reported.

Moderation analysis

To test the moderation effect of instructor's support on learning satisfaction and perceived learning performance, model one of Process macro developed by Hayes and Preacher, (2014) was used. Table 3 shows that the effects of instructor's support ($\beta = 0.1623$, $t(123) = 2.37$, p = .01) and SNS use ($\beta = 0.81$, $t(123) = 11.40$, p = .000) on learning satisfaction were significant. However, when interaction term was regressed, it did not produce significant effect ($\beta = 0.04$, $t(123) = 0.78$, p = .43) which can be regarded as no moderation effect was proved. Table 3 also shows that the effects of instructor's support ($\beta = 0.23$, $t(123) = 3.9$, p = .0002) and SNS use ($\beta = 0.71$, $t(123) = 11.46$, p = .000) on perceived learning performance were significant. However, when interaction term was regressed, it again did not bring out significant effect ($\beta = 0.051$, $t(123) = 0.95$, p = 0.34) which can be regarded as no moderation effect was proved. As the moderation analysis did not prove the hypothesis, hence

further examination of the interaction effect by plotting the slopes and high and low levels (1 *SD* above and below the mean) was not conducted. Hence hypotheses H 4(a) and H 4(b) have been rejected.

Table 3. Moderation analysis of learning satisfaction

Model summary						
	R	R^2	F	df_1	df_2	p
Model 1-- Learning Satisfaction	.8354	.6979	94.6982	3.0000	123.000	.0000
Model 2 --Learning Performance	.8561	.7329	112.5047	3.0000	123.000	.0000
Path coefficients						
	β	SE	t	p	LLCI	ULCI
1 Instructor's support---Learning Satisfaction	.1623	.0683	2.3754	.0019	.0270	.2975
Instructor's support---Learning Performance	.2311	.0592	3.9017	.0002	.1138	.3483
2 SNS use--- Learning Satisfaction	.8170	.0716	11.4097	.0000	.6752	.9587
SNS use ---Learning Performance	.7119	.0621	11.4680	.0000	.5890	.8348
3 SNS use * Instructor's Support (Learning Satisfaction)	.0486	.0616	.7890	.4317	-.0733	.1704
SNS use * Instructor's Support (Learning Performance)	.0510	.0534	.9550	.3415	-.0547	.1566

R^2-change due SNS use * Instructor's Support (Learning Satisfaction) = 0.0015
R^2-change due to SNS use * Instructor's Support (Learning Performance) = 0.0020

Discussion of findings

The study aimed to examine the effects of social networking websites platform on learning satisfaction and learning performance in higher educational settings. The use of social networking sites over a period of three consecutive semesters provided some useful insights from the study which are summarized in this section.

The study was a preliminary research which investigated the effects of SNS use on learning satisfaction and perceived learning performance of students in higher education with a mediating role of learner's interest and moderating role of instructor's support. The statistical results confirmed that SNS use in this study positively affected learning satisfaction and perceived performance of students.

The findings of this study are consistent with many previous studies. For example, in a study AL-Rahmi and Othman (2013) investigated students' satisfaction using social media in higher education and found that in social media interactivity with the teachers, engagement, perceived ease of use, perceived usefulness, and interactivity with peers all affect to shape students' satisfaction in higher education. They also found that collaborative learning in social media enhances student academic performance and SNS use creates interest among learners and their interest in learning shapes their learning satisfaction and performance. Thus, confirming the mediating role of interest in this theoretical model. The study found a partial mediation of learner's interest which implies that there is not only a significant relationship between the learner's interest and the learning satisfaction and performance, but also some direct relationship between the SNS use and learning satisfaction and performance. The results are again consistent with previous studies where Mbodila, Ndebele and Muhandji (2014) also confirmed the influence of using social networking websites on students' learning and engagement (interest) in higher education.

When instructor's support was regressed on learning satisfaction and perceived learning performance, it brought a positive effect on learning satisfaction and perceived learning performance. However, when interaction term was added to check the moderating effect, it did not bring out significant result. These findings are not consistent with many previous studies like den Exter, Rowe, Boyd and Lloyd (2012) who found the importance of role of teacher guidance for the success of this emergent approach of using Web 2.0 technology and of Ke (2010) who strongly advocated the presence of teachers for adult students in web learning, as adult students show more learning satisfaction in an instructor's continuous presence. Ford and Lott (2009) said that in constructivist learning environment, students are responsible for learning and teacher's role is of a facilitator. In their words "the social interactions between students and students, and teachers and students have changed. Students are no longer dependent on the teacher as the main source of information."

These findings do not show that instructor's support was a useless variable, in fact, its moderating effect was not proven. The non-significance of this moderator variable does not mean that there is zero effect of instructor's support in Web 2.0 learning environment. It might indicate that the study lacked the statistical power to

distinguish the value from zero. A possible explanation of this insignificant results is that moderation was checked on direct effect of SNS use on learning satisfaction and performance. However, this could also be checked in the form mediated moderation and moderated mediation. Defining the path in this way might provide the instructor's support as a significant moderator in the study. The finding is that instructor's support is a valid and strong predictor of learning satisfaction and performance. However, path defining its moderating role needs to be re-devised.

The use of social networking sites provided the learners an opportunity to construct their knowledge and engage themselves in this learning process. In the context of social networking sites, students could construct their own knowledge, share and collaborate with their peers. They could see the progress of other students; thus, social aspect of learning was included in this technology. In this way, learning was an active process and student centred approach was evident in this case. Teachers' role was as a facilitator in this case. In consistency with theory and practice, students were expected to expand their knowledge beyond the walls of the class. Hence, in the light of constructivism theory, they could learn in an active and social process. They were engaged in "active dialogue" with their fellows and the teacher. Hence, an interactive learning community was established that facilitated better learning outcomes. The learning outcomes in the form of students' satisfaction and perceived learning performance from students' opinions is evident that social networking sites promote and support constructive learning which strengthens their learning outcomes. Overall, the students found the use of social networking tool as helpful in their learning and it had a positive effect on their learning satisfaction and performance.

Limitations and future recommendations

Though this study could unveil some interesting and meaningful results, there are still some limitations and like any other study, this study is not an exception. The first limitation of this study was that it was conducted in a single university and context. The implementation of such a study across many departments and universities could expose more angles of this phenomena. The second limitation of this study was inclusion of students in an IT course where students could take it mandatory as part of learning technology for a course. Hence, involvement of students from other courses of social sciences would shed more light on this problem area. Another limitation was inclusion of only one gender, i.e., female which could have caused a gender bias. The investigation of gender role in using IT has been evident in previous studies. However, this part was beyond the control, as the research method adopted in this study required no inclusion of gender effect. This study of social networking sites provides a baseline to further investigate the potential of Web 2.0 technologies in academia. The study triggers the need for more investigation on the topic by investigating further research constructs to better predict technology integration process in academia and exploit them as active teaching and learning tools. Considering this study's findings, the same method and research design can be applied to different contexts across other universities and study disciplines with larger sample size and diverse learner groups. The significant and non-significant variables in this study can be further examined in other studies. Future research can be conducted to find the role of individual difference in gender, personality, type of academic in using social networking sites for learning.

Implications

Undoubtedly, as evident in this research, there are so many technological tools available that can boost learning and teaching in higher education. However, the remote control of using such technologies is in the hands of teachers whose willingness and adoption of technologies determine the actual success of technology infused learning. The findings from this study have important implications for teachers, higher education policy makers, trainers as well as software designers. By taking Edmodo as a successful learning case in this study, teachers can do more to utilize other productive web 2.0 tools to enhance collaborative learning among their students that goes beyond the classroom. Teachers can also innovate their teaching styles offering their students more novel opportunities to learn. However, teachers need to define their role and level of involvement in online community while blending the classroom with web 2.0. Teachers or practitioners can use social media in classroom to blur conventional communication among teachers and students by promoting their passion for leaning. The findings of this study confirmed an increase in students' learning outcomes, hence, teachers can use web 2.0 technologies to help shy students feel more confident, promote learning among peers and enhancing students' self-efficacy.

Software designers could introduce specialized social networking software for learning in each discipline. They can also integrate social networking site features into existing learning management systems. Many important

insights can also be yielded for instructional designers and scholars who are interested in integrating online collaborative communities to support learning. For them, a thorough understanding of teacher's role could help to find a way to perfectly align the new technology with existing pedagogical methods. For policy makers and instructional designers, it is necessary to make sure the availability of technical resources and support at campus for a productive blended classroom.

Conclusion

The findings of this study confirmed that students in higher education sector in Pakistan are ready to accept and adopt new technologies that can better facilitate their learning process. They are ready to create and share their knowledge in a collaborative manner by using technological platforms. The outcomes of using Web 2.0 tool in education are encouraging for teachers and practitioners who want to experience and facilitate their teaching process with new emerging technologies. It can be concluded that social networking sites hold a place in teaching and learning in higher education. The use of social networking sites provides a holistic learning process, and to endorse their values in education, they must be tested as an opportunity. The conclusion of this study insists on the utility and necessity of constructive and collaborative learning beyond class boundaries using the web 2.0 tools. Students must be allowed and facilitated to share their own generated content to strengthen their learning. To meet the global challenges and development in higher education, educational institutes must adopt these technologies. Hence, it is vital to take advantage of the software which are freely available to remain competitive by providing world class education. The higher education sector in Pakistan must not consider it as simply buying and installing the software in universities; rather, it should be regarded as a social change in higher education sector "an indispensable aim to shape a generation of young learners."

References

Aaltio, I., & Heilmann, P. (2010). Case study as a methodological approach. In *Encyclopedia of case study research* (pp. 67–78). Thousand Oaks, CA: SAGE Publications. doi:10.4135/9781412957397.n28

Ahdell, R., & Andresen, G. (2001). *Games and simulations in workplace eLearning* (Unpublished master thesis). Norwegian University of Science and Technology, Norway. Retrieved from https://pdfs.semanticscholar.org/107c/815ac8f7237d555c12958d89ba02c5a1e778.pdf

Admiraal, W., Huizenga, J., Akkerman, S., & Ten Dam, G. (2011). The Concept of flow in collaborative game-based learning. *Computers in Human Behavior, 27*(3), 1185–1194.

Alexander, B. (2008). Deepening the chasm: Web 2.0, gaming, and course management systems. *MERLOT Journal of Online Learning and Teaching, 4*(2), 198–204.

AL-Rahmi, M. W., & Othman, S. M. (2013). Evaluating student's satisfaction of using social media through collaborative learning in higher education. *International Journal of Advances in Engineering & Technology, 6*(4), 1541–1551

Barczyk, C. C., & Duncan, D. G. (2013). Facebook in higher education courses: An Analysis of students' attitudes, community of practice, and classroom community. *International Business and Management, 6*(1), 1–11. doi:10.3968/j.ibm.1923842820130601.1165

Boyer, W. (2010). Quantitative single-case research design. In *Encyclopedia of case study research* (pp. 764-766). Thousand Oaks, CA: Sage Publications.

Brem, A. (2010). Case study as a teaching tool. In *Encyclopedia of case study research* (pp. 77–78). Thousand Oaks, CA: Sage Publications. doi:10.4135/9781412957397.n28

Brown, J.S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32–42.

Caldwell, M. J. (2015). *Going where students are: Comparing faculty and student uses and perceptions of social networking in education* (Unpublished doctoral dissertation). The University of Tennessee at Chattanooga, Chattanooga, TN. Retrieved from https://scholar.utc.edu/cgi/viewcontent.cgi?article=1293&context=theses

Chu, S. K. W., & Du, H. S. (2013). Social networking tools for academic libraries. *Journal of Librarianship and Information Science, 45*(1), 64–75.

DeLone, W. H., & McLean, E. R. (2002). Information systems success revisited. In *Proceedings of the 35th Annual Hawaii International Conference on System Sciences (HICSS)* (pp. 2966–2976). doi:10.1109/HICSS.2002.994345

den Exter, K., Rowe, S., Boyd, W., & Lloyd, D. (2012). Using Web 2.0 technologies for collaborative learning in distance education, Case studies from an Australian university. *Future Internet, 4*(1), 216–237.

Duke, C. R. (2002). Learning outcomes: Comparing student perceptions of skill level and importance. *Journal of Marketing Education, 24*(3), 203–217.

Ford, K., & Lott, L. (2009). The Impact of technology on constructivist pedagogies. *Theories of Educational Technologies*. Retrieved from https://sites.google.com/a/boisestate.edu/edtechtheories/the-impact-of-technology-on-constructivist-pedagogies-1

Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology, 67*(3), 451-470.

Helou, A. M., & Rahim, N. (2014). The Influence of social networking sites on students' academic performance in Malaysia. *International Journal of Electronic Commerce Studies, 5*(2), 247–254. doi:10.7903/ijecs.1114

Imlawi, J., Gregg, D., & Karimi, J. (2015). Student engagement in course-based social networks: The Impact of instructor credibility and use of communication. *Computers & Education, 88*, 84–96.

Junco, R., Heiberger, G., & Loken, E. (2011). The Effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning, 27*(2), 119–132.

Ke, F. (2010). Examining online teaching, cognitive, and social presence for adult students. *Computers & Education, 55*(2), 808–820.

Kruger, C. J. (2010). *Latest ICT Trends in Enhancing Education.* Retrieved from https://www.scribd.com/document/119743952/SACLA029-pdf

Lave, J. (1993). The Practice of learning. In S. Chaiklin & J. Lave (Eds.), *Understanding practice* (pp. 3-32). New York, NY: Cambridge University Press.

Lee, J. K. (2008). The Effects of self-regulated learning strategies and system satisfaction regarding learner's performance in e-learning environment. *Journal of Instructional Pedagogies, 1,* 30-45. Retrieved from https://files.eric.ed.gov/fulltext/EJ1056334.pdf

Matzat, U. (2009). Disciplinary differences in the use of internet discussion groups: Differential communication needs or trust problems. *Journal of Information Science, 35*(5), 613–631.

Mazer, J. P., Murphy, R. E., & Simonds, C. J. (2007). I'll see you on "Facebook": The Effects of computer-mediated teacher self-disclosure on student motivation, affective learning, and classroom climate. *Communication Education, 56*(1), 1–17.

Mbodila, M., Ndebele, C., & Muhandji, K. (2014). The Effect of social media on student's engagement and collaboration in higher education: A Case study of the use of Facebook at a South African university. *Journal of Communications, 5*(20), 115–125.

McLoughlin, C., & Lee, M. J. (2010). Personalised and self-regulated learning in the Web 2.0 era: International exemplars of innovative pedagogy using social software. *Australasian Journal of Educational Technology, 26*(1), 28-43.

Mehmood, S., & Taswir, T. (2013). The Effects of social networking sites on the academic performance of students in college of applied sciences, Nizwa, Oman. *International Journal of Arts and Commerce, 2*(1), 111-125.

Mirabolghasemi, M., & Iahad, N. A. (2013). Social network intervention for the enhancement of students' social presence in relation to satisfaction and perceived learning. *International Journal of Web Based Communities, 9*(2), 233–242.

Moody, D. L., & Sindre, G. (2003). Evaluating the effectiveness of learning interventions: An Information systems case study. In *Proceedings of European Conference on Information Systems (ECIS)* (Article 80). Retrieved from https://aisel.aisnet.org/ecis2003/80/

Munguatosha, G. M., Muyinda, P. B., & Lubega, J. T. (2011). A Social networked learning adoption model for higher education institutions in developing countries. *On the Horizon, 19*(4), 307-320.

Park, H. (2012). Relationship between motivation and student's activity on educational game. *International Journal of Grid and Distributed Computing, 5*(1), 101–114.

Powless, S. J. (2011). College student satisfaction: The Impact of facebook and other factors (Unpublished doctoral dissertation). The University of Toledo, Toledo, OH.

Rogers, K. (2007). Lessons learned about educating the gifted and talented: A Synthesis of the research on educational practice. *Gifted Child Quarterly, 551*(4), 382–396.

Sanchez, R. A., Cortijo, V., & Javed, U. (2014). Students' perceptions of Facebook for academic purposes. *Computers and Education, 70*, 138–149.

Smith, C. F. (2007, April). *When in Rome: Teaching 21ˢᵗ century students using 21ˢᵗcentury tools.* Paper presented at the Instructional Technology Conference, Tennessee. Retrieved from http://students.ed.uiuc.edu/arosu2/IdealHighSchool/21stcenturytools.pdf#page=3

Stern, L. A., & Taylor, K. (2007). Social networking on Facebook. *Journal of the Communication, Speech & Theatre Association of North Dakota, 20,* 9–20.

Terenzini, P. T., Pascarella, E. T., & Blimling, G. S. (1999). Students' out-of-class experiences and their influence on learning and cognitive development: A Literature review. *Journal of college student development, 40*(5), 610–623.

Walsh, M. (2010). Multimodal literacy: What does it mean for classroom practice? *Australian Journal of Language and Literacy, 33*(3), 211–239.

Zhao, S., Grasmuck, S., & Martin, J. (2008). Identity construction on Facebook: Digital empowerment in anchored relationships. *Computers in Human Behavior, 24*(5), 1816–1836.