

Using Social Networking Technology to Enhance Learning in Higher Education: A Case Study using Facebook

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Abstract

In this paper we explore the possibility of using Web 2.0 technology, specifically social networking technology, to support a community of practice in a graduate-level classroom setting in order to enhance learning. For our experiment, we utilized Facebook as a learning resource for an MIS course for learners to share prior knowledge and experience. We present the results of our five-month study, and found that Facebook provides an easy-to-use and familiar technology for learners to leverage social networking to share and generate tacit knowledge amongst each other within the small group environment.

1. Introduction

Web 2.0 technology has garnered much attention from researchers and practitioners [2]. The popularization of the earlier generation of the World Wide Web during the 90's ushered in a new era, with several new and exciting channels for communication and networking with one another across vast distances. E-mail, File Transfer Protocol, and chatrooms were some of the new instruments representing the first wave of technology, sometimes retroactively dubbed "Web 1.0," adopted during the beginning of the Information Age [11]. Rapid advancements in information and communication technologies have transformed nearly every aspect of people's lives. As Thomas Friedman claims in his seminal book, *The World is Flat* [6], the Information Age has brought about a leveling of the playing field in terms of information creation and dissemination. The creation, synthesis, and dissemination of information is no longer limited to professionals, and can now be engaged in by the average layperson.

Electronic social networking services such as MySpace and especially Facebook have rapidly gained popularity. The model of the web as a decentralized search engine to look for information or communicate with others is becoming obsolete. Today, users harness network effects and use social networking tools to formulate their own personal networks: People create a personal space where they are the centralized node. The main difference between existing as their own centralized node with one's own personal space in which information revolves around oneself and simply joining or belonging to a public domain – such as discussion forum – is that having a personal space gives users a sense of ownership over their online persona. [10] [12]

Web 2.0 provides users with a personalized platform that relies on mostly asymmetric information exchange. As a centralized node, users can connect with others through the different channels of their mutually shared online social networks, mirroring the way people network in real life. This represents a paradigm shift in terms of how people use technology to communicate in everyday life. Web 2.0 technology emphasizes how people converse, collaborate, and share knowledge amongst one another, instead of simply having a discussion within the public domain. Web 2.0 focuses on user-driven content, where whatever messages users convey within their conversation may not represent goal-oriented communication as it does in e-mail or chat. Although the trend in how people use Web 2.0 technology provides exciting new ways for people to communicate, it also compels researchers and practitioners to find new ways in which Web 2.0 technology can enhance time-honored activities, like education.

This paper explores the use of social networking Web 2.0 technology to enhance education. Through social networking software, specifically Facebook,

we seek to form a community of practice as a supplement to a college-level course to better help students share and generate tacit knowledge.

The paper is organized as follows: First, the researchers examine the potential of using communities of practice and different Web 2.0 technologies within the realm of education. Second, we report on our study, in which we utilized social networking technology to enhance learning in a graduate-level introductory MIS course. Finally, we report on the lessons learned during the five-month study and suggest research findings and contributions.

2. Background

2.1. Communities of practice

This study is grounded in the concept of Communities of Practice [13]. Etienne Wenger developed the concept of communities of practice from Situated Learning theory [14]. Situated Learning theory states that learning is most effective when done in in-context settings than when out-of-context are taught in a lecture hall. According to Situated Learning, knowledge is a function of three components: Activity, Context, and Culture. Brown et al assert that learning knowledge concepts is like learning new words, in that learners index both the situations and activities in which the concepts are used, and that they will continuously evolve with each new occasion of use, as each use of the concept in a new context will “recast it in a new, more densely textured form” [15]. Brown et al further likens learning new knowledge concepts to an apprenticeship – cognitive apprenticeship. Much like how a student learning to apply a new knowledge concept in a community draws similarities to a neophyte learning to use new tools in an apprenticeship, the way a knowledge concept is used is heavily reliant on the community where the concept is learned and applied.

There are two types of knowledge: explicit and tacit [16]. Explicit knowledge is the kind of codified and decontextualized knowledge taught in a lecture hall. Tacit knowledge, however, is the kind that is generated and shared during informal conversation. For example, it is the kind of knowledge a member of a community would learn from conversations with peers that he or she would later internalize and make part of their own actions and experiences [17]. Tacit knowledge is innately contextualized, embodying one’s expertise [18,19]. However, it is much harder to codify and store as an information bit.

Forming Communities of Practice is a method for helping create the authentic situations, activities, and contexts for generating and sharing tacit knowledge. Communities of Practice are groups of people who share a common concern or passion and seek to learn it better through interaction with others within the group [20]. Communities of Practice help foster a culture of learning, in which learners share their prior experience and learn from the experience of others [13].

This study seeks to form a community of practice within an undergraduate-level classroom setting using social networking technology.

2.2. Web 2.0 and social networking technology

The concept of ubiquitous computing – a model of human-computer interaction in which Web 2.0 technology integrates information processing into everyday activities as network free from same-times/same-place restraints – is inching towards reality. As society’s inhabitants more tightly connect to one another, we are seeing the transformation of the world into the Global Village envisioned by Marshall McLuhan [9]. In the concept of the Global Village, the world is seen as a small village whose residents are connected and communicate through electronic means.

Li and Bernoff (2008) classify the trend in which people utilize different kinds of social technology to acquire information goods from one another, rather than from an established entity (such as a company or classroom), as a phenomenon called “The Groundswell” [8]. This phenomenon displays two important attributes of Web 2.0 technology: Users recognize the web as first, a service delivery platform; and second, as the collective wisdom of the crowd [7]. Facebook is a strong example of this phenomenon. It exists as both a service delivery platform and a hive for collective groupthink. As an example of a system that elevates the user as a centralized node, around which information revolves, Facebook allows users to create an online personal space, where they can gather their friends and family within their own personal network.

Whatever purposes people use these services for in their lives, Web 2.0 and Social Networking Technology represents an undeniable force that empowers people’s ability to communicate and foster social connections with one another to form different types of communities of practice. This technology has attracted the attention of several different fields. As we have done in this study, educators can use social networking technology to create a community of practice within a classroom setting, wherein all

stakeholders can engage in various learning activities that would otherwise not be possible in a solely brick and mortar setting, leading to an enhancement of the informal learning process for their students. For example, a discussion board or blogging tool would allow students to share and catalogue – through informal conversation with their classmates – tacit knowledge embodying the unique histories and experiences of their peers. Although the implementation of Web 2.0 technologies in many fields is still young and has yet to mature, it is clear that the trend of Web 2.0 adoption will continue as long as there is a need for people to socialize and communicate.

2.3. Social networking technology in academia

Educators have always been early adopters in using new technology within their field. For years, educational technology such as Content Management Systems (CMS), Blackboard, Sakai, and WebCT were used to help students perform better, as well as increase their productivity within the classroom. The aforementioned technologies enabled educators and students to better manage the learning process and share knowledge. Educators used technology such as file uploading, discussion boards, and chat room services to streamline and enhance the education processes. Simple tasks and services such as giving out assignments electronically, online grading, and class note repositories are available through the web. However, the availability of such tools and technology comes with the advent of an increasingly more complex learning environment for today's students. Learning not only occurs within the traditional classroom, but students as well as educators also often try to reach out to the abundance of information and knowledge outside the classroom. For example, students can listen to a podcast being distributed from iTunes University (iTunes U), one of the largest educational podcast databases in the world. Universities stream their lectures online, and create and store their class lectures to distribute through the iTunes Store, where students can download them for free in MP3 format. Another example is the use of virtual classrooms like SecondLife [5], where students can mimic a real-life learning environment by attending and participating in the learning process as it happens within a virtual classroom. Participants can interact with their teacher as well as other students through virtual personas called Avatars. This has been used for distance learning, but has other applications, e.g. letting

students in an architecture, art, or history course walk through a virtual recreation of an art gallery or a historically significant building they would otherwise not be able to visit in the real world.

The aforementioned technologies serve a common purpose in providing additional channels for students to network and learn electronically. Furthermore, they can be used to extend and reach out to learners who might not otherwise have a chance to be actively involved in the regular learning process: These tools can be used by potential learners who might be less involved, introverted, or simply unable to show up to class. Hence, Web 2.0 technology serves as a terrific tool to reach out to those students who might otherwise have a difficult time getting involved in the learning process – in other words: a tool to reach out to the Long Tail of learners, e.g. students with difficulty participating within a physical classroom, for reasons that could include shyness, or time and place constraints that prevent them from coming to campus regularly – such as a part-time job, children, or a long commute.

The concept of the Long Tail, refers to how given a large consumer population and high freedom of choice, the selection and buying pattern of the population results in a power law distribution wherein the upper 20% of items (the head) are favored over the other 80% (the long tail) [1]. Applied to an education setting, the usage of Web 2.0 can enable the educators to reach out to as many learners as they possibly can: While 20% of a given classroom might already be willing to participate in class, there is 80% that are unwilling or unable to do so, but who might be able to via different Web 2.0 channels. Ullrich, et al. [11] suggests that use of Web 2.0 technologies can be used to break down these participation barriers.

3. Experimental study – case study

3.1. General description

The study got its start from an annual faculty brainstorming meeting in October 2009. Twelve MIS faculty members from Thammasat University attended a two-day brainstorming session. One of the meeting objectives was to improve the teaching pedagogy of the Introduction to MIS course (IS201). IS201 is a required course for first year students, providing them with basic understanding on how management can use various kinds of information technology to improve their business processes. One of the major issues raised during the sessions was to update the material taught in IS201 to be more

relevant and timely for the first year students. The main reason for the change was based upon the assumption that the incoming students possessed considerable background on Information Technology due to the widespread popularity of IT products and services in their lives. Hence, we assumed that the current and future crop of student would be more knowledgeable in basic and intermediate concepts that would be covered in the course. Thus, we needed to adjust our curriculum according to the changing environments and demographics of our students.

To improve our curriculum, we discussed various tools and techniques to be designed and implemented to enhance teaching pedagogy as well as create an engaging learning environment. In the end, we decided to use the popular Social Networking Site (SNS), Facebook, as the chosen artifact. We decided to experiment using Facebook for three IS201 courses in June 2009. We believe that Facebook has strong potential to achieve our two main objectives: first, to enable our instructors to build and maintain strong connections with and amongst the first year students; and second, to create an informal learning environment by having students collaborate and learn from each other. We believed the second objective to be reliant upon completion of the first, as sound personal bonds are often the prerequisite to vigorous and meaningful informal conversation between peers. Previous studies have been conducted on generating social capital in the classroom with social networking software, wherein the software artifact was built from the ground up [21] [22]. However, in doing so, students have to overcome the hurdles presented by having to learn to use a new tool and build a new online identity from the ground up. Thus we reached the decision to use Facebook as our Social Networking artifact, as most of our students would be familiar with it and have an existing profile ready prior to the start of the term. We realized that to be successful, we must also implement different strategies that will enable our students to communicate and collaborate effectively through continued use of the artifact. Hence, we adhere to Social Constructivism and Situated Learning concepts to help us succeed in building an effective learning environment for the course.

3.2. The Collaborative introduction to MIS classroom

The Introduction to MIS course was held in the Winter 2009 session (October 2009 – February 2010). It covers how organizations can benefit from using different types of information systems and

technology. The goal was to use Facebook as an artifact to enhance communication and collaboration amongst all those involved in the course; students, instructors, and instructor assistant. One of the primary reasons for choosing Facebook over other SNS is because of the artifact's popularity amongst our students. 69 out of 75 students who attended the Facebook Social Learning Project training during the first week of the semester already had a Facebook account, and most used Facebook on a regular basis. Thus, the two instructors trained and instructed all students how to use Facebook to collaborate and communicate with other members within the "IS201 Group." Our goals were 1) to explore how users use Facebook in the context of a course, 2) to investigate the extent to which using Facebook would lead to collaboration amongst all members, and 3) to examine if Facebook could help foster an engaging learning environment and 4) to form a community of practice that enables the students to achieve learning through social interaction via the Social Networking artifact.

4. Results

4.1. Overview

The five-month study took place during the second semester of the 2009-2010 academic year at the Faculty of Commerce and Accountancy, Thammasat University. Altogether, 69 students, 2 lecturers, and 1 assistant instructor took the role of active participants, while 6 non-registered students and 3 faculty members from the MIS and Finance department took the role of non-active participants. The observation period lasted 15 weeks – 105 days – wherein all members played different important and interrelated roles in using the system. We explained the system usage protocols and designated different users' clusters to the initial three groups (Learning Facilitators, Active Participants, and Learning Assistants), while the latter two groups (Observers, Friends of the Community) subsequently joined us during the rest of semester. We also limited the number of privileges for the members of the latter groups, in order to prevent certain possible misuse scenarios (e.g. breach of students' privacy). The five groups were:

1) Learning Facilitators (LF) – The two instructors attempted to guide and facilitate all students to both learn from in-class exercises and discussions. We provide students with class slides and case studies and usually allow students to share their IT-related experiences, such as their favorite IT

gadgets and their how their use helps them in their everyday lives, i.e. day-to-day life management. The teaching pedagogy in enabling all the students to fully participate during class discussion proved to be very popular amongst all members, where lively conversation often led to student-generated discussion within in the classroom. In addition, the instructors often guided the in-class discussion and assigned students a weekly assignment where students need to complete the assignment before the next class discussion. This strategy allowed the instructors to further promote collaboration amongst all members, who can carry on class discussion online through Facebook and allow all members to voice and respond to each other thoughts outside of the classroom.

2) Active Participants (AP) – 69 students used Facebook to communicate with each other outside of classroom. They play the important role of creating User-Generated Content (UGC) through wall posts, commenting on others' content, and posting photos and videos. The active participants also constantly update the Facebook group by posting IT-related news, as well as responding to each others' comments, answering and responding to others' questions, and asking others questions through their Facebook wall.

3) Learning Assistant (LA) - A teaching assistant was assigned to oversee the communication lines between all members. Her main task was to answer class related inquiry by students, as well as send out assignment reminders to students.

4) Observers (O) – Three faculty members from the MIS and Finance Department who were interested in using Facebook for their future courses. They joined the IS201 subgroup but they mostly observed the ongoing activities without any active role in system usage. However, they often gave the 2 instructors off-line suggestions and feedbacks.

5) Friends of the Community (FOC) – Six students from prior classes who requested to join the Facebook subgroup. There was no definite task assigned to this group, but they occasionally made comments on various wall posts and conversed with friends who were taking the course to advise them and share knowledge gleaned from prior experience.

The researchers relied on data triangulation to gain research outcomes. We employed different data gathering techniques to obtain our data.

- Usage Analysis – We tracked and analyzed the activities over the 5 months period. We counted all activities from the four groups (AP, LF, LA and FOC). We did not record the activity by the Observer group, as they play an inactive role in the system.

Furthermore, we analyzed the activity according to a chronological timeline to see the usage behavior over the entire period of the study.

- Semi-Structured Interviews – To gain better understanding on how users use the system, we asked all students to submit a 3 minute video for system evaluation. In addition, both instructors also gained user feedback from weekly in-class discussions.
- Survey – We also distributed a survey at the end of semester. We intended to see if students were able to learn by using Facebook as a learning artifact.

4.2. How are students using Facebook in the context of a course?

To answer this question, we employ usage analysis to track all posts. There were a total of 2640 posts in the Facebook Social Learning Project. All posts were tracked, coded and categorized as to whether:

- it includes the posts by instructors, students and teacher assistant. This content included mainly class announcements and homework inquiries (Wall)
- it includes the weekly assignment posts where instructors and students collaboratively converse about IT-related issues (Discussion)
- it includes class attendants taken by instructors (Professor Cam), student presentation, group work and whiteboard photos taken by students. Also, students upload current IT news that are directly link to in-class discussions (Photo)
- it includes instructors' class introduction and assignment example videos. Students also submitted a 3 minutes Facebook system evaluation video as a class assignment (Video)
- comments from both instructors, students, the teacher's assistant, and friends of the community. The comments were counted from the wall, photo, and video sections (Comment)
- it includes a tag from photo and video sections (Tag)
- it was one of the quizzes generated by students (Quiz)
- it was the private communications between instructors and students (Private Message)

All posts were examined, analyzed, and coded by the 2 instructors to ensure the reliability of the coding process (See Table 1). It can be stated that the most popular activity occurred in the comments section, where users made comments and responded to each other. All user groups (AP, LF, LA and FOC) were involved in this section. Most of the comments were students' responses to different sections, such as IT news, as well as their back-and-forth conversation amongst themselves. Discussion also had a high amount of activity, however all of the activity in this section was mandatory, as most discussion were based on the weekly assignment that students have to answer the IT related questions. Three groups (AP, LF and LA) participated in this with the exception of FOC. Posting photos was also a popular activity, where students used this feature to post pictures related to IT news, as well as pictures of class attendance. Only two groups (AP and LF) utilized this section. Wall posts and private messages were used as a communication channel between all members (AP, LF, LA and FOC), and UGC such as tagging and quizzes were used by students to tag their friends in Facebook content, as well as create informal and fun quizzes for others. Only Active Participants used this section.

Table 1. Active participation by group member

| | Summary | AP | LF | LA | FOC |
|-----------------|---------|------|-----|----|-----|
| Wall | 163 | 105 | 45 | 10 | 3 |
| Discussion | 678 | 648 | 27 | 3 | 0 |
| Photo | 194 | 150 | 44 | 0 | 0 |
| Video | 78 | 75 | 3 | 0 | 0 |
| Comment | 1363 | 1173 | 155 | 20 | 15 |
| Tag | 104 | 104 | 0 | 0 | 0 |
| Quiz | 25 | 25 | 0 | 0 | 0 |
| Private Message | 35 | 25 | 6 | 2 | 2 |
| All Posts | 2640 | 2233 | 282 | 33 | 20 |

As shown in Table 1, Observers were not directly involved, but rather, constantly gave off-line feedback to the main researchers on the system's performance.

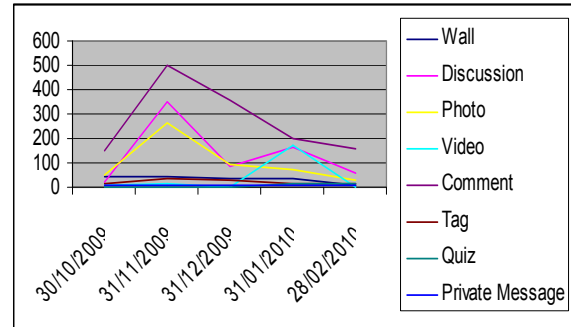


Figure 1. Chronological timeline of activity

Figure 1 above shows the chronological timeline of all activities. The highest amount of activity occurred in November- December. These months were the busiest in terms of class assignments, as well as members starting to get acquainted with one another in ways which involved generating a high amount of discussion and comments between participants.

4.3. Can Facebook be used as a collaborative technology?

Table 1 and Figure 1 show a surprising number of posts on the Social Networking Site. On average each students wrote 34 posts or 2 posts per week. The most used feature was commenting (about 53% of content), which shows lively communication between students or between students and instructors. To gain a better understanding of how students used the system in a collaborative manner, we asked the students to explain how they used the system to collaborate with other students or the instructors. Below are what some of the students said about using Facebook as a collaborative tool:

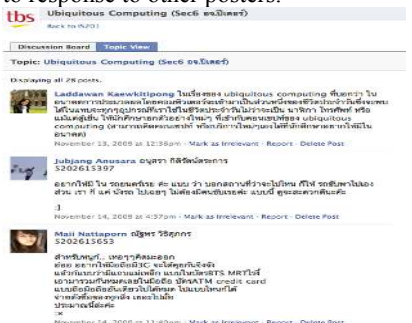
"I like using Facebook in IS201; it gives me the chance to interact with my classmates and the teachers outside of classroom. Since I already use Facebook on the daily basis so it's nice for me to just browse on Facebook and then visit the IS201 group to see what others are up to."



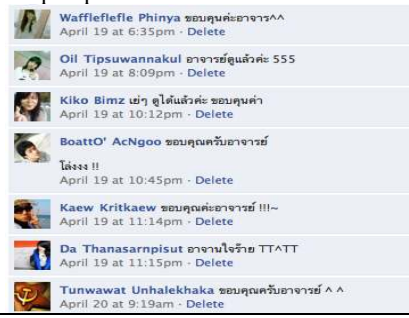
"Facebook provides a good tool that integrates existing web technology such as Discussion board, chat, blog and YouTube. The tool provides more of the 'community-based' feeling where I feel comfortable sharing knowledge with the people I network with from my class."

"I like the ability to ask questions on the Facebook Wall where I can some answers from both my classmates and our instructors"

Along with the combination of descriptive data available from Table 1 and the qualitative data obtained from the evaluation video, this information shows strong evidence of a high number of communicative and collaborative activities amongst all students. Students were able to use different sets of Facebook features to achieve collaboration and help each other. Furthermore, Facebook provided a familiar tool with which to provide a community-like artifact where users felt comfortable to help each other to achieve their goals. Table 2 shows how each features was used as a collaborative tool by users

Table 2. Summary of features

| Features | Collaboration protocols |
|------------|---|
| Wall | <p>Instructors and students use the Wall to communicate with each other. Oftentimes, students help each other in answering each other's questions.</p>  |
| Discussion | <p>Students shared knowledge with one another by sharing their answers to the discussion assignments. In addition, many returned to the discussion thread to response to other posters.</p>  |
| Photo | <p>Students scanned and posted IT news on Facebook and gave summaries of the</p> |

| | |
|---------|---|
| | <p>posted news. Many students oftentimes made interesting comments and responded to each other in this section.</p>  |
| Video | <p>Students made evaluation videos voicing how they want to see the system improved and subsequently suggested that the class should use the Facebook Quiz feature as another fun tool for use in the class.</p>  |
| Comment | <p>Students made constructive comments on each other's posts, sometimes helping other class members to answer some simple questions.</p>  |
| Tag | <p>Student tagged each other in pictures and videos. They usually tagged each other to identify their friends who attended the class, thus they might borrow their class notes if they missed lecture.</p> |

"I really like to share knowledge with others on the discussion board. Often times I would be able to clarify what the professor said during his lecture by looking at others' posts. Also I can read my classmates' input on difficult topics I did not understand."

"One particular topic I really like was for us to discuss our tacit knowledge and share with the rest of the class, that discussion help me to know my classmates' skills or hobbies."

5. Further outcomes

The main purpose of the setting was to set up an informal social constructivist learning environment. The artifact and the setting provided students with familiar technology to serve their different purposes. Although many students were not familiarized with using Facebook as a collaborative learning tool, over time the amount of usages increased at a healthy pace (See Figure 1). A number of features, such as Discussion, Wall Posts, and Tagging were used by students to converse and subsequently participate in different collaborative activities. Sharing IT news and responding to others in the Photo section were popular amongst all users. Also, the Quiz feature was a big hit, where a lot of students could create and take each others quizzes. Furthermore, most also shared

We also distributed a set of surveys to all users at the end of the semester. Out of 75 surveys distributed, 58 were returned, of which 55 were valid. The results show that 78% of the students think it's useful to use Facebook as a supplemental learning

the Quiz results on their friends' Facebook pages as well.

5.1. Proposed new features

In addition to the primary features that Facebook offered, we also asked our students what they would like to see in future systems. Many students suggested that we should include different edutainment, such as Quizzes, Games, and Mobile features to make the class more fun.

Table 3. Proposed new features

| Future Features | Survey Results | Suggestions |
|------------------------|----------------|---|
| <i>Facebook Quiz</i> | 39 out of 55 | 70% of students believe that Facebook Quizzes have strong potential for future courses. However many cautioned that if students were the allowed to create their own quizzes, the content validity might be compromised. A student suggested: "I like to see more quizzed for our class. It is fun, but I am not sure if the answers were all correct." |
| <i>Facebook Game</i> | 32 out of 55 | 58% of students believe that Facebook Games should be included for future courses. However, most did not mention specifically what type of game they are interested in. A student suggested: "The instructors should offer the fun Facebook game for our class" |
| <i>Facebook Mobile</i> | 52 out of 55 | 94% of students want us to integrate mobile phone technology for the class. A student suggested: "I usually use my mobile phone to answer the question in the discussion forum. I wish the instructors will offer other Facebook related homework, so I can do it on-the-go." |

6. Conclusion

In terms of information learning via social networking technology, as the results of the surveys and in-depth interviews showed, informal learning

occurred in a social constructive manner where students, instructors, and other community members collaborated, conversed, shared knowledge, and helped each other to gain better understanding of the subject matter through vigorous discussion. Social networking technologies such as Facebook allows members to participate in a learning environment where the learning process can occur interchangeably from both inside and outside of the classroom. However, the execution of certain class activities such as lectures, homework, assignments, and participation (both in-class and virtual) must be well organized. An instructor should employ different learning strategies that are well suited for her/himself, while constantly remaining aware of the importance of keeping the interaction fun, honest, and – most importantly – articulated.

To summarize, the successful use of Social Networking technology in service of social constructivist learning and the increased value of using the tool is substantial to both students and instructors. For the students and the instructors, this can be summarized with the following points:

For Students;

- *Some degree of informal learning through informal communication*
- *Support for collaboration*
- *Feedback on thoughts*
- *Collaboration independent of space and time*

For Instructors;

- *Gaining feedback from students*
- *Constant communication with students*
- *Produce an effective instructional technology for their customers*

It can be concluded that Social Networking Sites such as Facebook have great potential for the future by expanding teaching and learning beyond the classroom. It provided users with a familiar and easy-to-use technology, which could easily be adapted from use in a personal setting to use in an educational setting. The smooth transition from using Facebook at their own leisure to using Facebook in a group setting provided great incentive for all parties to embrace the adaptation process and subsequently provide lively and meaningful social interaction. Thus, we conclude that social networking technology can be used effectively to foster a culture of learning, as a learning tool within a small group of users. Further research on mobile learning through smartphones, as well as different strategies to

transcend from informal to formal learning should be investigated.

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