Social networking sites, Web 2.0 technologies and e-learning

by
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Abstract

The purpose of this research study is to attain an understanding of the use of social networking sites and Web 2.0 technologies by computing students for e-learning.

Social networking sites have mostly been accepted by university students, and such sites are influencing many aspects of university student life. E-learning is also increasing in the tertiary industry, which is changing the way students learn and teachers instruct. In this thesis, the researcher has investigated attitudes, behaviours and knowledge of computing students towards the use of social networking sites in e-learning. Data has been collected from online survey and interviews, and analyzed to discover the current tendencies for the use of social networking sites in e-learning by computing students. In this research, an understanding of how social networking sites are being used in e-learning, why this group of students use these sites and how they use these sites is sought. Analysis and discussions in this research is aimed at answering eight research questions:

1. What social networking sites are used by computing students?
2. What is the history development status and acceptance of social networking sites?
3. What is the history development status and acceptance of e-learning?
4. What is the current status of the use of social networking sites in e-learning?
5. What are the attitudes of computing students in relation to the use of social networking sites for e-learning?
6. How will these factors affect the use of social networking sites for e-learning on campus?
7. What features of social networking sites and Web 2.0 technologies facilitate e-learning?
8. What is the perception of computing students about the future use of social networking tools in e-learning?
After investigation and doing some research, the researcher found that FaceBook is the most popular social networking site that computing students use it for e-learning to achieve their study goal.
Keywords

Web 2.0, e-learning, web2.0 technologies, social networking sites, FaceBook
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SNS: Social networking sites
LMS: Learning management system
CBT: Computer-Based Training
VICES: Virtual Instructional Classroom Environment in Science
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1. Introduction

1.1. Overview

This section introduces the topic and outlines the research conducted by the researcher. In this section is discussed the emergence of web2.0 technologies, the development of online learning and the factors that encouraged the researcher to take a serious interest in doing research in this area.

A significant part of this study is the investigation and discussion of web 2.0 technologies, e-learning and social network sites and how this helps with online learning. The objective of this study is to attain an understanding of the use of social networking sites and Web 2.0 technologies by computing students for e-learning. This research is defined by eight research questions and this research study will seek to answer these research questions.

A mixed research methodology has been chosen as the research methodology. The forms were designed and tested and a target population was identified and contacted. Data was collected using online survey and interviews. The survey was conducted using Survey Monkey.

Collected data was analysed to find answers to the research questions. Limitations of study are listed and conclusions drawn. Ideas for further research in this area are also in this thesis.

1.2. Background

With the emergence of web2.0 technologies in the last few years, social network sites have become a popular way of sharing information and discussing certain issues.
There are many social websites such as FaceBook, Flickr and MySpace that people use to create networks of friends. A massive amount of information and content are collected, shared and disseminated through social network sites. “Every minute, ten hours of video are uploaded to YouTube; Flickr contains over two billion photos”. (Cha, Mislove, & Gummadi, 2009) Consequently these social network sites have been exploited as a well-liked platform for information sharing, communication and dissemination. “Millions of people are using social network sites to connect, meet, and share. The users of the most popular sites on the Internet, MySpace.com, Facebook.com, Bebo.com, and Orkut.com, are predominantly young-twenties, college students, and teenagers.” (DiMicco et al., 2008)

Worldwide, the term “e-learning” has been used in a diversity of contexts. “e-learning” is also known as, or closely related to “telelearning,” “online learning” “distance learning,” “open learning,” “computers in education,” and “flexible learning.” All these terms have a common purpose, to allow people to communicate with each other to achieve and enhance their educational opportunities (Campbell, 2004). According to Carliner and Shank (2008), the university sector is a strong candidate for the greater use of e-learning.

E-learning provides another useful way for learners to achieve their study purposes rather than the traditional education mode (face to face in classroom). E-learning offers learners 24/7 access to study material and often support without having to commute, which encourages developing independent study culture. With the emergence of Web 2.0 technologies, a very large variety of online tools (blogs, wikis, podcasts and social bookmarking sites) have been assembled so that a highly personalized learning environment is built up by the learner. Downes (2005) suggested that this phase of e-learning in combination with Web 2.0 (current development trend in e-learning) is called e-learning 2.0. This phase powerfully focuses on the collaborative nature of e-learning, like learners creating their own studying contexts and contents, and collaborating with others to form a learning
network with distributions and responses. Along with the development of Web 2.0 technologies social networking sites, such as Facebook.com, MySpace.com and Twitter, have become more and more popular. According to DiMicco et al. (2008), tertiary students, teenagers and young people are the main users of social networking sites. Social networking sites provide professional platforms where the participants could build up connections, share their ideas, events and actions within their individual network. Learning management systems (e.g. Blackboard and Moodle) are being widely used in e-learning at tertiary level and social networking sites are being adopted as a way of studying communication between tertiary staff and students. It means that connections are being set up between social networking sites and e-learning.

The author of this study found that many tertiary students like to use social networking sites to share their interests, activities and events. In the meantime, some computing students would like to take advantage of the features of social networking sites helping their study. Thus, the researcher thought that these areas are very interesting and decided to investigate and research the use of social networking sites in e-learning by computing students. A suitable research topic was identified and research questions were formulated in accordance with the identified research objective. The researcher expected that some valuable information would be obtained after this research study, which could help computing students improving the use of social networking sites for e-learning.

1.3. Outline of the Project

The purpose of this research study is to attain an understanding of the use of social networking sites and Web 2.0 technologies by computing students for e-learning. It seeks to identify which social networking sites they often use in e-learning, why they use these sites and how they use these sites. The research questions are:

1. What social networking sites are used by computing students?
2. What is the history development status and acceptance of social networking sites?
3. What is the history development status and acceptance of e-learning?
4. What is the current status of the use of social networking sites in e-learning?
5. What are the attitudes of computing students in relation to the use of social networking sites for e-learning?
6. How will these factors affect the use of social networking sites for e-learning on campus?
7. What features of social networking sites and Web 2.0 technologies facilitate e-learning?
8. What is the perception of computing students about the future use of social networking tools in e-learning?

The objective of this research is to gain useful data and information to answer the research questions and achieve the aims of the project. All of the questions above are used to elicit response from computing students from their own viewpoint using surveys and interviews. Most survey questions require quantitative answers and interview questions need qualitative answers. Therefore the methodology of this project is designed as a mixed research method. The process of data collection is composed of literature review, survey and interview.

This thesis consists of six chapters, which includes introduction, literature review, research methodology, data collection, analysis and discussion, conclusions, limitations and recommendations.
2. Literature Review

2.1. Overview

The purpose of the literature review chapter is for the author of this research to extract related information from academic literature (books, electric database, journals, and conference proceedings) in order to investigate, summarize and review the issue of e-learning, web2.0 and social networking sites. There are four parts in this chapter: Overview, Literature, Literature Map and Summary. In the following section 2.2 Literature, the researcher will review all selected literature relevant to e-learning, Web2.0 technologies, and social networking sites defining these, tracing their history, development status and acceptance. The aim of the process of Literature Review is to help find some answer to the research questions and lay the foundation to this research. The Literature Map is presented in section 2.3 and the Summary of the Literature Review is in section 2.4.

2.2. Literature

2.2.1. E-learning

➢ Definition

Worldwide, the term “e-learning” has been used in a diversity of contexts. “e-learning” is also known as “telelearning,” “online learning” “distance learning,” “open learning,” “computers in education,” and “flexible learning.” All these terms have a common purpose, to allow people to communicate with each other to achieve and enhance their educational opportunities (Campbell, 2004). According to Carliner and Shank (2008), the university sector is a strong candidate for greater use of e-learning. In addition, Higher Education Funding Council for England (2005) defined e-learning as encompassing: “Flexible learning as well as distance learning,
and the use of ICT as a communications and delivery tool between individuals and groups, to support students and improve the management of learning.” Garrison and Anderson (2003, p6) argued that the most important feature of e-learning is “its capacity to facilitate communication and thinking and thereby construct meaning and knowledge”. Turvey (2009) emphasises that the key of e-learning is on communication and interaction based on the concept of evolving e-learning above.

Mason and Rennie (2006) indicated that e-learning can be described as an effective learning process made by combining digitally delivered content based on service and support. They also referred to e-learning as an element of flexible learning that employ any available electronic media in order to approach the way of professional education and training. According to Fallon and Brown (2003, p4), “Any learning, training or education that is facilitated by the use of well known and proven computer technologies, specifically networks based on Internet technology.” Piskurich (2004, p4) defined e-learning as: “any form of learning that utilizes a network for delivery, interaction, or facilitation. The network could be the Internet, a school or college LAN or even a complete WAN. The learning could take place individually or as part of a class. Online class meet either synchronously or asynchronously, or some combination of the two.” In other words, e–learning is learning using computing tools and communication, with the learners being able to learn anywhere, anytime. Such tools may include computing hardware and software, and mobile device. The communication technologies may include the Internet and wireless technologies.

➤ **History, Development and Future**

Anttonen, Onnela, and Terho (2006, p8) stated that “Since the 1990s there has been a vogue for e-learning in most disciplines of higher education. During our research it has become obvious that history is among those disciplines where e-learning has not been widely adopted. Nevertheless, it has become equally clear that there are great advantages in certain learning situations, with specific pedagogical cases and with certain history-specific themes.” Early E-learning systems were based on
Computer-Based Training (CBT) that endeavour to replicate autocratic teaching styles in order to achieve the goal of transferring knowledge. As early as 1993, Graziadei described an online computer-delivered lecture, tutorial and assessment project developed by him over the past few years, which is called Virtual Instructional Classroom Environment in Science (VICES). These VICES can be created by the instructor and students through electronic mail, VAX Notes conferences and Gopher/Lynx together with a few software programs.

Graziadei, Gallagher, Brown, and Sasiadek (1997) described “a process of evaluating products and developing an overall strategy for technology-based course development and management in teaching-learning. The product(s) (currently Web-based) had to be easy to use and maintain, portable, replicable, scalable, and immediately affordable, and they had to have a high probability of success, with a long-term cost-effectiveness.” With the emergence of new technologies today, there are plenty of technologies suitably used in e-learning includes blogs, virtual classrooms, collaborative learning software etc. Most current e-learning management systems in education use a combination of these technologies.

Buzzetto-More (2008) stated that “Learning that is facilitated by electronic technologies (tools), otherwise known as e-Learning, can be either fully online, mixed mode (also known as hybrid), or web assisted.” Regardless of the delivery method, a number of tools are employed by students and instructors. Buzzetto-More also argues that “students find course Websites to be helpful resources that enhance the understanding of course content, and that these Websites will continue to have an impact on higher education in the future. The strongest preference noted in this study was towards the online submission of assignments, with students overwhelmingly noting that they like having the ability to check their assignment grades online.”

E-learning management systems are a collection of online tools that can support teaching and learning. Heinrich, Milne, Crooks, Granshaw, and Moore (2006) claimed that “Today’s widely used learning management systems (LMS) such as
Blackboard and Moodle, provide basic support around the management of assignments. These systems allow the lecturer to setup an assignment definition, the students to submit their assignments, the lecturer to access the student submissions and to return marked assignments, and the students to retrieve their marked assignments. Setting up an assignment definition includes the specification of parameters for due dates, extension periods or multiple submissions. The LMS relieves the individual lecturer of the responsibilities for secure access and safe storage. The student prepares the assignment outside the LMS, using general purpose tools, submits the assignment and receives results via a web-browser interface.”

Ball (1990) suggested that education in the 21st century must be developed in more innovative and wide-ranging ways. He pointed out that the way of traditional education should be changed from passive learning to active participation. Forman, Nyatanga and Rich (2002) suggested that “E-learning is an important development in education. It recognizes the shift from teaching to learning and puts the learner before the institution. Institutions, equally, have to change their mental set and move away from traditional learning modes to more innovative, and participative ones.”

Even if e-learning is unlike other forms of education, it has been gradually accepted by the education industry on the whole. According to Greer (2010), there is exciting news that the value of e-learning in the global market had reached US$27.1 billion by 2009. They forecasted and analysed that “The demand is growing by a five-year compound annual growth rate (CAGR) of 12.8% and revenues will reach $49.6 billion by 2014. North America will be the top distance learning buyers throughout the 2009-2014 forecast period. In the 2009 market, Western Europe accounted for the second highest expenditures, by 2014, Asia will overtake Western Europe and account for the second highest global expenditures on online education after North America.”

According to report by Ambient Insight (2009), it predicted that North America would keep on being the largest e-learning market during the next five years. At the
same time, Asia would overtake Western Europe in the following five years, with an incredible development, to reach the No.2 position.

Mason and Rennie (2006) explained that student’s acceptance of e-learning is playing a significant role in fuelling the growth of e-learning. The results of recent investigations of student satisfaction with e-learning are usually affirmative. For example, a survey study of college students’ internet use in US showed (Jones and Madden, 2002) that more than 79% students agreed that the use of Internet was becoming more and more important in their academic studying experience. Approximately 50% of college students thought that online communication provide enhanced opportunities for them to discuss course related ideas with their teachers compared with traditional face to face classrooms. Hisham, Campton and FitzGerald (2004) presented some facts affecting students’ satisfaction with the use of e-learning, such as personalised feedback, content, interface and learning communication. They concluded that “Well structured, high quality content that is presented in an easy to understand format along with receiving personalised feedback on their progress are important elements of effective e-learning. Coupled with these factors is the need to learn in a community and the ability to select resources from the asynchronous e-learning system to suit their personal needs.”

Fallon and Brown (2003) indicated that: “E-learning can be classified into two broad categories, synchronous and asynchronous.” Synchronous e-learning allows participants at different locations to interact with each other at the same time using Internet technologies. There are some special collaboration tools used in synchronous e-learning, such as interactive online chat and electronic whiteboard. It is interesting that some collaboration tools used in e-learning can allow interactive session or presentations to be recorded for later watching, thus turning these into asynchronous e-learning. To put it simple, Asynchronous e-learning is “the web-based version of computer-based training, which is typically offered on a CD-ROM or across an organization’s local area network” (Fallon & Brown, 2003). It is helpful for lecturers
and learner when they wish to work and study at different times and from different places. For example, the learning contents and courseware (the combination of text, images, animation, sound or movies) are normally kept on a web-server that is available to learner 24 hours per day and 7 days per week, which is managed and monitored by e-learning management systems such as Moodle and Blackboard. Using their personal username and password, learners can take courses at any place and any time by accessing the resource on the web-server through any workstation connected to the local area network (campus network) or the Internet. Lecturers also can do their teaching work at any time and any place through the e-learning management system.

Chadha and Kumail (2003) stated that “The role of technology in e-learning has so far been that of an enabler. All the investments have been towards shifting traditional classroom on-line. Be it traditional net-based training or the more recent phenomenon of virtual classrooms or live learning, technology has been used to simulate traditional learning events. When e-learning first came to fore, it was believed that the technology would change the way people learn.” The mobile Internet is taken as one of most important tools of e-learning to push significant content to the student, anywhere and anytime. Although the technology of mobile Internet is still in its early stages today, a few knowledge building tools allow students to receive messages regarding their studies on their personal mobile phone through SMS. As mobile technologies evolve further in the near future, students will configure their preferences in their mobile phone so that they can receive useful e-learning contents, materials they actually want to learn, in addition to message related to their studies. Chadha and Kumail (2003) also mentioned that “the future without doubt, belong to just-in-time leaning, with a little help from pervasive computing.” It allows learners easy access to their courses related information stored on network and enables them to study anywhere, anytime, which will result in the performance of just-in-time learning.

Welsh, Wanberg, Brown and Simmering (2003) identified that there are four themes regarding the future of e-learning:

1. growth in synchronous learning;
2. prevalence of blended solutions;
3. improved technology and access; and
4. integration of information provision, performance support, peer collaboration, and training.

As the technologies develop and improve, synchronous learning will be becoming more and more prevalent. Meanwhile, they predicted blended learning solutions also enlarge with the trend of increasingly synchronous learning. With the technologies improved, the use of e-learning would boost and go further.

➢ Delivery Method for E-learning

Delivery method “means by which a course is accessible to the student; can be television at a remote site, cable TV, videotape, via the Internet, CD ROM, computer disk or by standard mail. Many distance education courses have a F2F (face-to-face) component as well.” (NETnet, 2010) Tertiary education makes use of different delivery method to support teaching and learning. The regular method of teaching is traditional face-to-face classroom instruction. With the emergence of new technologies and e-learning, tertiary education is developing a number of delivery methods to meet e-learning needs. E-learning is said to involve the use of technologies to allow learner to study in many different times and sites. To support these diverse learning demands, a few e-learning delivery methods will be required. Kolâs and Staupe (2004) claimed that: “E-learning systems are often dedicated to one or a few delivery methods.” Internet Time Group (2009) stated that “eLearning is not a method of training; it's a framework that invites the use of whatever method best fits the situation at hand.” They classified e-learning delivery methods, as shown as below:

➢ Classroom, instructor-led training: instructors & learners in same place at same time
➢ Virtual class: same time, different places. Two-way audio, generally shared application space, sometimes shared video. 15 to 20 learners maximum.
➢ Virtual lecture: same time (although can be recorded for replay later), different places. Often have email to lecturer, intra-group chat, poll taking.
Mentoring: one-to-one assistance & coaching. Can be email, phone, in person, instant messaging. If scheduled in advance, it's "office hours."

Discussion board, threaded discussion: any time.

Chat: real-time online "conversation." ephemeral--if you miss it, it's gone. Usually gets off track fast.

Real-time discussion: can be expert-led or confined to a single topic. Unlike a chat, the discussion may be archived for future reference.

Study group or buddy system: can be as simple as two people working at one computer (often more effective than studying solo).

Help desk: on demand. 1:1 problem-solving advice. Can be phone or email or Instant Messaging.

Email: the modern equivalent of a phone call or chance encounter in the hall. (Just make sure everyone’s got the email addresses they need.)

Kolås and Staupé (2004) noted that there is focus on “blended learning” in some education institutes, which combine online and offline delivery methods in e-learning programmes. Blended learning has been widely performed in some school as it helps instructors and learners achieve their study goals. A number of models have been developed and perfected as require. Overall, the aim of these models is to make it easy for both instructor and learner to choose the correct applications (tools) for their studying purpose. Almashaqbeh (2006) emphasized that “distance education by using electronic mail, video conferencing, and online software such as Blackboard, will surely help students to better communicate with their teachers.” It seems that Blackboard offers good opportunities for instructors to reach a broad learners audience. Learners were required to use many of functions of Blackboard to employ studying such as digital drop box, discussion board, viewing assignments, and course related material posted by the teacher. It is a useful tool that could be used as a web-based delivery platform in terms of e-learning. Moreover, learners would be motivated to employ this tool as a delivery tool for e-learning.

Learning Tools (sites) For E-learning

E-learning systems are becoming more and more useful resources to provide learners with good opportunities for learning. Therefore, features of e-learning environments and e-learning tools should include access to students with various abilities or disabilities. Freire, Linhalis, Bianchini, Fortes, and Pimentel (2010) advocate “a course site where users can access several e-learning tools, such as schedule,
announcements, portfolio, chat, whiteboard, instant messenger, and so on.” Nowadays more and more e-learning tools are created for online instruction in the field of education technology, to create a collaborative learning environment. Bonk and Wisher (2000) stated that “E-learning tools refer to Internet-based programs designed for instructional purposes, such as interactive multimedia displays or threaded electronic messaging. Web-based collaborative environments are a special category of e-learning tools that support a group of learners in achieving a common learning goal.” C4LPT(2009) classified top 100 tools for learning that include a few famous websites and course management system such as Twitter, Youtube, Moodle, Wikipedia and FaceBook. Hence, those websites can be used as individual learning tools, as well as collaborative learning environment by students. As a result, Learning Tools (sites) for E-learning could be classified as computer conferencing, Email, Instant Messenger, Online Chat and Forum, Online learning Management System (Blackboard or Moodle), and Website. As described above, it can be clearly found that some learning tools have intersected with e-learning delivery method such as e-mail, online chat, forum and learning management systems (Blackboard & Moodle).

➢ Collaborative E-Learning

Smith and MacGregor (1992) said that “Collaborative learning is an umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together. Usually, students are working in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product. Collaborative learning activities vary widely, but most centre on students’ exploration or application of the course material, not simply the teacher’s presentation or explication of it.” Collaborative learning is normally described as groups of learners studying together to explore for understanding, which includes collaborative writing, group discussion and joint problem solving, and some other activities. In short, collaborative learning refers to a situation where two or more students attempt to study together.
The intersection between collaborative learning and e-learning is collaborative e-learning. Salmons (2006) defined collaborative e-Learning as “Constructing knowledge, negotiating meanings and/or solving problems through mutual engagement of two or more learners in a coordinated effort using Internet and electronic communications.” This is a good approach to e-learning that employs collaboration skills to contribute to e-learning process. E-learning in a collaborative environment can happen at anytime and anywhere while individual students are in discussion group through the Internet or electronic communications. Anderson (2010) mentioned that “collaborative and cooperative learning increases learning effectiveness, motivation, persistence and develops interpersonal and communications skill collaborative. Social software allows groups of students to efficiently schedule their activities, meet online via text chat, audio, video or immersion technologies and to engage collaboratively in a variety of brainstorming, mind mapping, group games, simulations, project management, and other types of organisational, administrative and learning activities.” Social networking applications with sites such as FaceBook and MySpace have been incredibly popular. Those networked tools on social networking sites that provide more efficient and motivating ways to encourage learning from traditional classroom instruction to an online interaction environment whilst keeping individual control learning time, space and activity. Anderson (2010) mentioned that “Like all technologies, the use of social networking presents both opportunities and challenges to educators and learners. Social networking learning designs will prove more effective, efficient and motivating ways to support learning than any previous forms – including both traditional campus based and distance education.” Educational applications could be guided by instructors in their courses, which provide opportunities for learners and instructors to find out and evaluate how the social networking tools utilized on their learning.

- **E-learning Classification**

Garrison and Anderson (2003, p43) pointed out “e-learning technologies have developed to the extent that quality teacher-student activities can be supported either
among groups or individually, and in either real time (synchronously) or in delayed time (asynchronously).” Therefore, Sher (2009) identified that there are three types of interaction supported through e-learning.

✧ **Teacher-student interaction:** refers to the interaction between instructor and learner such as delivering knowledge, ask question and provide feedback.

✧ **Student-student interaction:** it is collaborative and co-operation learning among students in absence of the instructor, which normally take the form of exchange information and idea, group studying and discussion.

✧ **Students-content interaction:** it is the way that the learner gets the knowledge from the course content. The course content can be presented by either audio, videotape, in the form of text, CD-Rom, or online resource.

The author of this research is going to add another type of interaction supported through e-learning on the basis of current development of e-learning to Sher’s (2009) three types listed above. This fourth type of interaction added by the author is:

✧ **Students-other people with required knowledge:** it means that the learner gets required knowledge from other people. For example, a student can discusses course contents with his classmate through FaceBook. Consequently, he/she is going to learn how to use FaceBook and ask his/her friend for help. His/her friend is good at using FaceBook and willing to impact enough knowledge about FaceBook to the learning student. As a result, the student acquires adequate skills in the use of FaceBook and then starts to contact his/her classmates to discuss course content using a number of functions of FaceBook.

During the last decade of e-learning development, e-learning has begun transforming the forms of learning and education. Based on different forms of e-learning, it can be classified into several categories. E-learning classification could help researcher distinguish learning efficiency from different formats, and recognize how it change the learner studying experience. Falch (2004) advised four kinds of e-learning classifications: “e-learning without presence and without communication, e-learning
without presence but with communication, e-learning combined with occasional presence, and e-learning used as a tool in classroom teaching.”

- **Model A**: E-learning where the teacher and the students never meet physically, and where no dialogue between students or students and the teacher takes place.

- **Model B**: E-learning where the teacher and the students never meet physically, but where the dialogue between the participants is supported by use of IT based communication services.

- **Model C**: E-learning where parts of the learning takes place in a class room and parts of the learning is done elsewhere, where the students work on a computer on their own. e.g. at home or at their place of work.

- **Model D**: E-learning where all teaching is done in a classroom, and where computers are used as a learning tool.

According to Falch’s (2004) presence/communication classification for e-learning, Negash and Wilcox (2008) proposed that e-learning could be expanded to six types to distinguish between virtual presence and physical presence. The following table shows the six types of e-learning:

<table>
<thead>
<tr>
<th>Classification</th>
<th>Presence*</th>
<th>eCommunication**</th>
<th>Alias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>Yes</td>
<td>No</td>
<td>Face-to-Face</td>
</tr>
<tr>
<td>Type B</td>
<td>No</td>
<td>No</td>
<td>Self-Learning</td>
</tr>
<tr>
<td>Type C</td>
<td>No</td>
<td>Yes</td>
<td>Asynchronous</td>
</tr>
<tr>
<td>Type D</td>
<td>Yes</td>
<td>Yes</td>
<td>Synchronous</td>
</tr>
<tr>
<td>Type E</td>
<td>Occasional</td>
<td>Yes</td>
<td>Blended/Hybrid-asynchronous</td>
</tr>
<tr>
<td>Type F</td>
<td>Yes</td>
<td>Yes</td>
<td>Blended/Hybrid-synchronous</td>
</tr>
</tbody>
</table>

**Table 2.2.1: The six types of e-learning**

* Presence is defined as real-time presence where both instructor and learner are present at the time of content delivery; it includes physical and virtual presence

** E-communication refers to whether the content delivery includes electronic communication or not.
Type A: **e-learning with Physical Presence and without e-communication (face-to-face)**

Both teacher and student are physically present in the same place (classroom) that apply e-tools such as video clips, PowerPoint slides, and multimedia to deliver course contents.

Type B: **e-learning without Presence and without e-communication (self-learning)**

This format of e-learning is a method of self-learning. Students typically obtain the course related contents and study by themselves. This kind of e-learning is learning contents delivered on a particular paper/subject or application through recorded multimedia such as DVD, CD-ROM or social networking sites.

Type C: **e-learning without Presence and with e-communication (asynchronous)**

Neither physical nor virtual presences do not need to be done during studying contents delivery between the instructor and learner. The instructor prepares the course materials like lecture notes, PowerPoint slides, and assignment schedules in advance, and then publishes online for students. Learners access course materials posted online at a later time. The communication between instructor and learners is frequently made using one or more e-learning tools (technologies). Most people think this type of e-learning as “online learning”.

Type D: **e-learning with virtual Presence and with e-communication (synchronous)**

This format of e-learning can be called “real-time” e-learning. Although the teacher and student do not need to meet physically, virtual meetings should take place during course content delivery. Many technologies are applied in this format of e-learning such as chat, “Live” video/audio, instant messaging and so on.

Type E: **e-learning with occasional Presence and with e-communication (blended/hybrid-asynchronous)**

This format of e-learning is called bended/hybrid-asynchronous e-learning that is a combination of asynchronous e-learning and face to face e-learning. In this format, course content is delivered by occasional physical meetings that are face to face,
which is possibly held once a week, or a month. For example, the teacher and students make the exact meeting time through email.

Type F: e-learning with Presence and with e-communication (blended/hybrid-synchronous)

This kind of e-learning is called blended/hybrid e-learning that requires the instructor and leaner meeting at the same time during the course content delivery. Presence could be either physical or virtual. Therefore, some class sessions are held with physical presence like a traditional classroom setting (face to face), the rest of the class sessions are set with virtual presence like synchronously. Overall, it is a combination of synchronous and face to face e-learning.

2.2.2. E-learning Using Web2.0 Technologies

➢ The Definition of Web2.0

The term “Web 2.0” was firstly coined by Darcy DiNucci in 1999, and her “use of the term deals mainly with Web design, aesthetics, and the interconnection of everyday objects with the Internet; she argues that the Web is “fragmenting” due to the widespread use of portable Web-ready devices.” (Ruiz, 2008) The term Web 2.0 emerged as a new Web technology that began with a conference brainstorming session between Tim O’Reilly and MediaLive International in 2003 (O’Reilly, 2005). Web 2.0 is perceived as a second generation of web-based communities and hosted services, such as social networking sites, which provide easy to use tools for users to contribute content and share information (Carliner & Shank, 2008). Nowadays, Web 2.0 technology has become popularised and widely adopted, and has changed people’s styles for online learning. O’Reilly (2006) said: “Web 2.0 is the business revolution in the computer industry caused by the move to the Internet as a platform, and an attempt to understand the rules for success on that new platform.” It is on interface that allows internet users to interact with any contents of the WebPages, and with any other users.
McAfee (2006) pointed out that the feature of web2.0 technology can be summarized as SLATES:

- **Search**: to find out information through keyword via the Internet
- **Links**: a brilliant guide to connect information together among WebPages
- **Authoring**: Many of collaborative working would perform rather than a few of web authors. For example, posts and comments are made up in personal blog
- **Tags**: contents on sites will be categorized by means of tag (one word description)
- **Extensions**: it is easy for user to sort the contents of websites through application software
- **Signals**: the use of powerful tool is applied, such as RSS to inform user the change of contents on sites.

### Web 2.0 History Development and Future

Nowadays more social sharing and communication applications are transforming the Internet from a read-only to read-write web-based environment that is also called change from Web 1.0 to Web2.0. It is said that Web2.0 is the next stage of the Internet usage after the first stage Web1.0.

Brügger (2009) stated that a website is the collection of WebPages, images, videos etc. with the same domain name. For example, Amazon.com is a website that contains the collection of Web pages needed to set up this site. “Web 1.0 (1991-2003) is a retronym which refers to the state of the World Wide Web, and any website design style used before the advent of the Web 2.0 phenomenon. Web 1.0 began with the release of the WWW to the public in 1991, and is the general term that has been created to describe the Web before the "bursting of the Dot-com bubble" in 2001, which is seen by many as a turning point for the internet” (Wikipedia, 2010). In other words, it is called “static”, without any users’ interaction, which like a magazine or poster. You can buy many of them, read, enjoy or dislike them, but they keep the contents unchanged until the publisher modifies them.
Web2.0 technologies have become popular over the past several years, Web 2.0 is said to be a second stage web development that overtaking and dominates in numerous web-based applications and services in the traditional publishing model (Web1.0). Tredinnick (2006) observed that: “there are particular kinds of information and communications applications, such as the wiki, the blog, and RSS, and peer-to-peer networks. These applications generally put more power in the hands of users to select, filter, publish, and edit information and participate in the creation of information resources.” Since that time, the term Web 2.0 began its rise in popularity and found a place in the dictionary.

In short, comparing with Web1.0, Web 2.0 encourages and allows users to do more than read information and retrieve information from websites. Many user-interfaces have been provided through their browser, and users can publish data online through Web 2.0 tools as simply as they read online. Anyone could not only read available data from the Web but also write data to the Web. These Web2.0 applications allow users to interact, share and collaborate their available data (for instance, files, photos, video) with other users. Gillmor (2004) said, “In the past 150 years we’ve essentially had two distinct means of communication: one-to-many (books, newspapers, radio, and TV) and one-to-one (letters, telegraph, and telephone). The Internet, for the first time, gives us many-to-many and few-to-few communications.” The following table is shown the differences between Web2.0 and Web1.0:

<table>
<thead>
<tr>
<th></th>
<th>Web2.0</th>
<th>Web1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>User</td>
<td>Passive user</td>
</tr>
<tr>
<td>Write</td>
<td></td>
<td>Read</td>
</tr>
<tr>
<td>Personalisation</td>
<td></td>
<td>Lack of differentiation</td>
</tr>
<tr>
<td>Participation</td>
<td></td>
<td>Representation</td>
</tr>
</tbody>
</table>

Table 2.2.2: The differences between Web2.0 and Web1.0:
Rosen and Nelson (2008) identified three unique features of Web2.0 tools, which are useful to facilitate social sharing:

1. **User-initiated publishing of information**
2. **Social-sharing options with privacy controls that allow users to choose with whom information is shared, ranging from one-to-one to small, controlled groups to large-scale public sharing; and**
3. **Social networking options (i.e., the possibility of developing an Internet-based community around specific topics, publicly sharing, discussing, and collaborating on content, whether text, pictures, movies, or other media).** With the increased social interactivity that a Web 2.0 environment provides, information and experiences can be shared and published in many ways.

Web 2.0 tools include weblogs, wikis, e-library, and Flickr that primarily allow users to transform their individual networking activities into social networking activities. These changes mainly range from note taking, calendars, photo albums, and other personal events—into interactive, collaborative group sharing and discussion activities (text, photo, audio, video) on web-based communities, and demand for much less computing technical skill and knowledge in contrast to the precursor Web 1.0 tools.

If Web2.0 is second phase of Web development than Web1.0, the future of Web2.0 (the third generation Web development system) is Web 3.0. “Beyond the Web2.0, a vision for the Web3.0 - the Semantic Web – has already emerged, which consists of enriching data on the web with metadata conveying its meaning.” (Abadie, Maghiros, & Pascu, 2008) Meanwhile, Gillmor (2005) claimed that “the emerging Web3.0 would allow machines talk as much to each other as humans talk to machines or other humans”, and Yang (2009) declared that “Web 3.0 is defined as the creation of highquality content and services produced by gifted individuals using Web 2.0 technology as an enabling platform.” Briefly said, Web3.0 (the Semantic Web) provides an incredible data resource after integrating across a giant space of
information, and accelerates the Web 2.0 solution further, which seeks to organize the
global information in a radically more logical way rather than Web2.0.

- **Web2.0 Technologies With E-Learning**

Rosen (2009, p125) indicated that: “e-learning is a subset of the web, all trend,
technologies, and services that are found on the web can be applied to e-learning.”
He identified four types of latest web2.0 technologies, which are described as below:

- Rich site summary (RSS): a simple service that has enabled web2.0 functionality
- Podcasts: digital media files compressed
- Web Techniques: like Instant messaging (IM), Blogs, Wikis, Voice-over Internet
  protocol (VoIP)
- HTML and XML.

Furthermore, Carliner and Shank (2008, p275) also noted that Web2.0 technologies include:

- **Blogs**: which are dated online journals that are frequently updated by their
  authors, who are often called bloggers
- **Wikis**: which, like blogs, are easy to use web publishing tools and are web
  applications that allow a group of users to collaboratively add and edit web
  content without any programming knowledge
- **Social bookmarking application**: which allow users to easily save and categorize
  collections of their bookmarks of webpages using keywords called tags
- **Voice over Internet protocol (VoIP)**: a group of technologies that facilitate
  transmission of voice conversations over a data network
- **Podcasting**: a methodology for publishing multimedia file
- **Instant messaging (IM)**: a tool for real time, synchronous communication and
  collaboration through the Internet or a network
- **Mashups**: which pull together content from more than one source to create
  completely new online services.

The functions of web2.0 are being improved as the needs of learner. It is time to
consider improving the nature of e-learning as web2.0 arisen. A Kaiser Family
Foundation (2003) found that many young children are developing their digital literacy. It is critical for them that the Internet is a part of their lives. They are using social networking sites such as FaceBook and MySpace, Instant messaging tools like MSN and Yahoo Messager, in order to share information, communicate with each other, have fun, and so on. Children also shared tips and advice when doing their assignments. As a result of these experiences, these children could feel empowered to keep in touch with anyone, learn about everything, anywhere and anytime.

Renner (2006) claimed that “second generation web applications (web2.0) are transforming e-learning and opening new frontier for learner empowerment, control and engagement. New online technologies allow individuals to filter and control existing content (aggregation), easily create new content (personal publishing) and rapidly communicate, inform and distribute this information with peers through online social service.” With a very large variety of online tools (blogs, wikis, podcasts and social bookmarking sites) assembled, a highly personalized learning environment is built up by the learner. Downes (2005) suggested that this phase of e-learning in combination with Web 2.0 (current trend in e-learning) is called e-learning 2.0. It powerfully focuses on the collaborative nature of e-learning, like learner creates studying contents, and collaborates with others to form a learning network with distributions and responses. E-learning 2.0 approaches to personalization that utilizes diverse tools including courseware, search, online reference, and collaboration is more oriented to the social network service. In other words, effective e-learning 2.0 is taking advantage of social network service where students can share their idea and discuss course contents with peers. Social space can be created based on existing social networks. Take Wiki as example, it provides a full-featured platform for students to post and edit each other's content. Without time and space constraints, online communities can link up people from all over the world, which transform the traditional classroom into virtual classroom, and extending into the wider community. With the help of online community, students at a certain place could communicate with their classmates and friends far from their classroom.
2.2.3. E-learning using Social Networking Sites

➢ The Definition of Social Networking Sites

Social networking sites (SNS) are examples of Web 2.0 technologies, which can help people find connections that may be hidden in the real world. “A social network is a social structure consisting of individuals or organizations that are like-minded and are tied by specific types of interests, values, visions, friendships, kinships, lifestyles, etc.” (Northern Illinois University, 2009). Social networking sites are not only creating connections between people, but also providing great value for the educational sector and other organisations. Current popular social networking sites include FaceBook, MySpace, Hi5, Bebo, Friendster, Twitter, and Windows Live Space.

Boyd and Ellison (2007) defined social networking sites (SNS) as “web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site.” Most social networking sites allow users to upload profile photos, add or change multimedia contents on their profile. Other sites such as FaceBook encourage their users to upload and display information about themselves and their friends. That is to say, social networking sites provide a service that reflects social relations among people through the internet, which means users can interact with each other using services such as instant messaging. In short, social networking sites provide professional platforms where the participants could share their ideas, events and actions within their individual network.

Boyd and Ellison (2007) present the feature of social networking sites as “Beyond profiles, Friends, comments, and private messaging, social networking sites vary
greatly in their features and user base. Some have photo-sharing or video-sharing capabilities; others have built-in blogging and instant messaging technology.” Boyd (2008) emphasized that “Most social network sites support private messaging so that people can contact other members directly. Some sites support blogging and posting of videos. MySpace and Friendster have a bulletin feature where participants can post messages that all of their Friends can read. Other features that appear on social network sites include instant messaging, teacher ratings, message boards, groups, and classified ads. Exactly how these features are implemented differs by site.” In other words, it consists of social interaction, personalization, data portability and privacy. Social interactions mean how people find the social network sites and make a connection, and communicate with other people through a social network such as online discussion forum. Personalization signifies that people can design and decorate their own page (personal profile and blog) on social networking site to show it as a form of self-expression. Data portability indicates that users have the opportunity to import and export information from social network sites anywhere, anytime provided Internet access is available. Privacy means it can keep users’ social activities private as required. For instance, if the user does not want his friends to know what he is doing on the social networking sites, his friend cannot know it.

➢ The History and Development of Social Networking Sites

Raphael (2007) briefly described a time line of the history of social networking, which is presented below:

- 1995 = Classmates.com founded
- 1997 = Six Degrees of Separation founded
- 1999 = Circle of Friends founded
- 2002 = Friendster.com founded
- 2003 = MySpace.com founded
- 2004 = Orkut.com founded
- 2004 = Facebook.com founded
- 2005 = Yahoo!360 founded
The author of this research is going to add another period (2006-2011) of the history of social networking based on current development of social networking to Raphael (2007) time line listed above. This period of social networking development added by the author is:

- **2006-2011**: FaceBook being most popular social networking sites in the world

According to the above, the first identifiable social networking site was founded in 1995. Before that era, it was called The Infant Years of social networking sites. It tracked back to the BBS (Bulletin Board System), which allowed users to download and upload files and games, communicate with other users, read news and bulletin and so on. BBSs were popular among computer users in the 80s and 90s. In the mid-nineties, social networking reached adolescence with the booming of the Internet. The first site (Classmates.com) to fulfil the definition of social networking site was born. With a free membership of Classmates.com, users can create their unique profile and search their previous and currently classmates from kindergarten to college period. Nickson (2009) reported that “social networking hit really its stride with the launch of Friendster in 2002.” People enjoy posting message and blogging, keeping in touch with their friends through Friendster.com. As is known to all by few of years, many social networking sites were launched with a biz growing up. The most famous social networking sites are FaceBook and MySpace. FaceBook has current features similar to Friendster, which focused on the university and college communities. To become a member of FaceBook, users must have a working email. MySpace is a pleasurable and artistic social networking site that allows users to share their favourite music, music videos etc. after creating their personal profiles. However, the leading social networking site in the world is the ubiquitous FaceBook. It was founded in 2004 with opening to a campus-oriented area, and finally opened to the public in 2006. FaceBook experienced rapid growth in its first two years. At present FaceBook is serious business with many millions US dollar invested. (Nickson, 2009)

“Supported by Web 2.0, now if anyone wants to ‘know’ they are more likely to go to Google or Wikipedia. Many, particularly young, consumers of news are cynical about
what they read in newspapers or see on television. They read blogs from people on the scene, get personal opinions from postings on Myspace or Facebook, become immerse in virtual worlds on Second Life, interact on Twitter, see pictures on Flickr or videos on Youtube.” (Hasan & Ghose, 2009). The initial motivation to build social networking sites on the web was to reconnect with former school friends. With the vigorous development of social networking and enormous popularity, it expanded to sharing message (information), videos and music with others. In particular, they shared thoughts and perspectives of their culture and life interests by means of social networking.

Along with the development of Web 2.0 technologies, social networking sites, such as Facebook.com, MySpace.com and Twitter, have become more and more popular. There are millions of people, who are using social networking sites to share their stories, meet new friends, and catch up with old friends. In addition to the features of any other websites, social network website is different from “Old Web” that used web1.0 technologies. Cormode and Krishnamurthy (2008) said that: “there is a clear separation between a set of highly popular Web 2.0 sites such as Facebook and YouTube, and the “old Web”. These separations are visible when projected onto a variety of axes, such as technological (scripting and presentation technologies used to render the site and allow user interaction); structural (purpose and layout of the site); and sociological (notions of friends and groups).” To put it simply, social network sites enable users to share and exchange their ideas, event and activities. They allow users to take part in online social activities. Social networking sites facilitate the participation of the users such as personal blogs and e-commerce websites that provide many opportunities for each user to publish their ideas, actions and events in social network websites.

➢ The Future of Social Networking Sites

Along with the development of website technologies, social networking sites will become even more important in the future. The expansion of social networking
platforms (MySpace, FaceBook) will make our life easier and more convenient. Much change has already been taking place on a small scale since a few businesses were already exploiting social networking actively. Mobility is one of the important features of the future of social networking sites, along with using of 3G phones; the function of mobility for social networking sites will be developed and expanded gradually. It means people would have social networking sites in the pocket and travel with you anywhere. Location awareness is another feature for the future social networking websites; your friends would be able to see your location by using the global position systems (Harvey, 2008).

Social networking sites are becoming smarter. By memorising user behaviour, such as websites browsed, music listened to, friends talked to and articles read. Social websites will understand the basic interests of the person. According to Schmugar (2008): “Next-generation sites, called Social Networking 3.0, may in fact be perceived as spooky in the level of accuracy of this ‘artificial intelligence.’” Schmugar also mentioned that: “social bookmaking site functionality such as Digg will be married with social networks and enhanced with self-learning technology.”

Social networking sites can lead to more efficient learning, for example, people can study online, chat with classmates, ask questions on the social websites and review other students’ comments, etc. As well as the increased benefits, there will be some risks such as personal privacy on social networking will become a big concern by using the social networking sites. People’s life will become more transparent, there will be no secrets. Regardless social networking sites are rapidly expanding; more function is being added on the sites, and the number of users growing.

➢ Social Networking Sites With E-Learning

According to DiMicco et al. (2008), tertiary students, teenagers and young people are the main users of social networking sites. Because the predominant users of social
networking sites are school and college students, this is sufficient for the education industry to attract students to use social networking sites as learning tools.

“From an educational perspective, online social networking is also a learning practice for university students, since the learning environment of the university itself is a social system of individuals’ interacting within a shared academic context. Students’ social networking, especially when the networking increasingly shifts to online, is more likely to be self-initiated learning, in which individuals create a system of information and support by building and nurturing personal links” (Yu, Tian, Vogel & Kwok, 2010). Students would benefit by using social networking sites to help them with learning, because, the nature of using social networking sites is to maintain and establish relationships. Social networking not only impacts on tertiary students’ learning outcomes, but also assists them to obtain social acceptance from other people and acclimatize to university culture.

Traditionally, students are formed into study groups related by particular courses, they normally gather into a study room and discuss the assignments face to face. “Social interaction within an online framework can help university students share experiences and collaborate on relevant topics.”(Liccardi et al., 2007). With the emergence of social networking sites, students can change their studying way from face to face studying group to social web-based learning group. In other words, social networking sites can perform as a tutorial instrument for web-based learning. Additionally, social networks brought mobility and diversity into the university study life, “wireless connectivity and E-group allows student to become members of collaborative online networks and study groups.” (Liccardi et al., 2007). Students can talk and discuss any assignments with anyone while sitting at home, even in a Café, thus, students can save a lot of time on travel, and have more time for study.

It is a valuable method to utilise online social networking sites such as Facebook, MySpace to conduct learning activities, to work together with other students and
generate sound online learning environments. According to Yu, Tian, Vogel & Kwok (2010), these activities “will provide individuals with access to a diversified set of information from multiple sources, and help fulfil students’ ever growing networking needs and, therefore, improve their social learning effectiveness.” This makes it possible for people to share contents online and keep in touch with their online social friend networks. In general, it facilitates change from e-learning to social e-learning and makes learning more effective.

The social network provides opportunities for students to take part in planning classes, which allow teachers to identify which sports students prefer to play in a gym class. They could instruct each other in a group they have already created. Those working groups are like learning communities (Barbour & Plough, 2009). According to Ismail (2010), “Facebook, as well as other SNS’s, can be used as a platform for collaboration of course contents. It can link the students in a ‘Group’ to related articles, websites, social bookmarks, videos and blogs, to expand the students’ knowledge and support learning activities. The ‘Group’ could be used to announce latest updates on the course assessments and class activities, and to encourage discussion among students regarding the difficult topics and finding friends to form groups for their group assignments.” These students review their colleagues’ ideas and then discuss any suggestions about their studying and obtain useful information on each study working group. Social networking sites provide a valuable platform or virtual place where students can search academic help without physically face to their collaborator, which also motivated students to collaborate learning online and learn in what they are interested.

2.2.4. Current Issues regarding E-learning using Social Networking Sites

There are many different activities that are available on Social Networking Sites. Using Social Networking Sites for learning activities is one of the recent efforts from
both education providers and students. However, there are two sides, students do not only gain benefits from using Social Networking websites, there are also some issues regarding the use of Social Networking Sites for E-learning that needs to be considered.

Firstly, how to increase the awareness of using Social Networking Sites for learning is one of the vital issues. Online social networking has entered into people’s social life, along with the continuous development and improvement of web technologies, people’s social life would be even more influenced by these technologies. Facebook has over 500 million active users as at 2010 (Facebook, 2010). According to Light and McGrath (2010), “Facebook is a social networking site that was founded in the USA in 2004, by a Harvard University student, Mark Zuckerberg. The site initially targeted fellow students at Harvard but later expanded to include other universities, colleges and high schools.” However, tertiary students, teenagers and young people are mainly using the sites to connect with friends, sharing stories. For instance, “users can keep in touch with friends and family, especially with people not seen on a regular basis, find old friends, contact friends of friends, even contact people they didn’t previously know at all.” (Aïmeur, Gambs & Ho, 2009), Therefore, to increase the awareness of using Social Networking Sites for learning activities for students is an important issue and an essential step for developing the use of SNS in e-learning.

The other issue is privacy of using social networks; “the focus of current SNSs is interaction and sharing information between users without much concern about user privacy.” (Aïmeur, Gambs & Ho, 2009) Almost all Social Networking sites allow users to design their profiles that contain private information; and this information is seen and shared with other friends on these sites. “In these online social networks, people can form social links with others through making friends or joining groups with similar contents. Most of the time, online social networks acquiescently allow
people to publish all their profiles.” (Mo, Wang, Li, Hong & King, 2010) “However, due to the lack of user awareness and proper privacy protection tools, huge quantities of user data, including personal information, pictures and videos are quickly falling into the hands of authorities, strangers, recruiters and even the public at large.” (Aïmeur, Gambs & Ho, 2009). For example, a worker at Dunedin Burger King New Zealand, has been charged with serious misconduct after writing "Real jobs don’t underpay and overwork people like BK does" on her private Facebook wall. (Donnell, 2010) There are an increasing numbers of users, who take privacy as a top issue when they are using the social network sites. Therefore, to provide users with a flexible and trouble-free way to communicate their privacy concerns to third parties, others user and service providers, in particular, for SNS providers should create a strong privacy enhanced environment for users.

Thirdly, security is the other important issue, when people register on the social networking sites, most websites require an E-mail address, and requires true information for registration. According to Facebook’s privacy policy, when users want to create a new account on Facebook, they will be asked to provide their real personal detail such as date of birth. “Because your date of birth and gender are required, you cannot delete them. You can, however, edit your profile to hide all (or part) of such fields from other users.”(Facebook, 2011) However, social networking sites providers do not authenticate a registrant’s information, such as name, birthday, address or contact details, when they set up a new account. In other words, on Social networking sites, such as Facebook, the validation process of the site allows users to easily generate fake profiles, which enclose submission that is shared with other users (Light & McGrath, 2010). “In order to protect themselves, SNS users should be conscious about the danger of divulging their information and the security risks awaiting them within SNS.” (Aïmeur, Gambs & Ho, 2010). For example, users can use personal information gleaned from social networking sites, to hack into others email accounts; or using some fake identification to make friends, to conduct fraud and/or criminal action.
In conclusion, Social Networking sites have a number of beneficial functions for social networking, but the current issue for SNS is privacy and security, which are the common issues for social networking that have attracted more and more attention from users. Using social networking sites for learning purposes is a social issue that cannot be ignored, so finding out how to encourage students to use social networking sites for studying and learning activities is a valuable issue to explore.

2.3. Literature Map

A literature map is a useful tool to help the researcher identify the relationship between these publications and research questions. “This map is a visual summary of the research that has been conducted by others, and it is typically represented in a figure.” (Creswell, 2003, p. 39). The central idea of building literature map is to draw a visual picture of the research topic to present an outline of found literatures. Figure 2.3.1: Flow-chart Literature Map is the Literature Map for this study:
### E-learning
- **Definition**: Fallon and Brown (2003); Garrison and Anderson (2003); Campbell (2004); Piskurich (2004); Higher Education Funding Council for England (2005); Heinrich, Milne, Crooks, Granshaw, and Moore (2006); Mason and Rennie (2006); Carliner and Shank (2008); Buzzetto-More (2008); Turvey (2009);

### E-learning using Web2.0 Technologies

### E-learning Using Social Networking Sites

### Current issues for E-learning using SNS

### Research Questions

---

### E-learning Classification

### Learning Tools (sites) For E-learning

### Collaborative E-learning
2.4. **Summary**

This chapter reviewed the literature that included three fields in relation to the research topic: e-learning, web2.0 technologies, and social networking sites. In the meantime, some of discussions regarding the use of e-learning by web2.0 technologies and social networking sites have been presented. Some literature also suggested issues need to be considered when e-learning using social networking sites. Finally, the literature map was presented to provide a scoping document for this research topic.
3. Research Methodology

There are six sections in this chapter including chosen research method, survey process, interview process, data collection method, data analysis method and summary.

3.1. Chosen Research Method

According to Creswell (2003), there are three research methods that can be chosen by researchers to design their research studying. These are quantitative, qualitative and mixed research methods.

“Qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomena. Qualitative research involves the use of qualitative data, such as interviews, documents, and participant observation data, to understand and explain social phenomena.” (Myers.2007) According to Creswell (2003), qualitative research contains five sub categories that are, ethnography, grounded theory, case study, phenomenology and historical research. Qualitative research is used through observation, open-ended questions and semi-structured interview questions.

“A quantitative approach is one in which the investigator primarily uses postpositivist claims for developing knowledge, employs strategies of inquiry such as experiments and surveys, and collects data on predetermined instruments that yield statistical data” (Creswell, 2003, p.18). This kind of research method is often called “post positivist” and carried out through numerical and statistical data.

“Mixed methods research offers great promise for practicing researchers who would like to see methodologists describe and develop techniques that are closer to what researchers actually use in practice. Mixed methods research as the third research paradigm can also help bridge the schism between quantitative and qualitative research” (Onwuegbuzie & Leech, 2004a cited in Johnson and Onwuegbuzie, 2004).
According to the perceptive and specific research topic of this research study, the mixed research approach has been chosen by the researcher. Creswell (2003, p208) pointed out that “With the development and perceived legitimacy of both qualitative and quantitative research in the social and human sciences, mixed methods research, employing the data collection associated with both forms of data, is expanding.” The use of a mixed research method can offer a robust way for researchers to obtain rich qualitative and quantitative data in order to achieve research goals. This research study aims to attain an understanding of the use of social networking sites and Web 2.0 technologies by computing students for e-learning. It seeks to identify which social networking sites they often use in e-learning, why they use these sites and how they use these sites. By means of the mixed research method for this research study, the author of this research applied the corresponding data collection methods at different aspects of this research. A mixed research method is often called a combination of quantitative and qualitative data. This is because data collection of mixed research method is mainly done by both quantitative and qualitative data. As nine interviews and the online survey were conducted to collect primary data for this research, both qualitative and quantitative elements were involved into this research. The researcher used e-mail communication and face-to-face interviews to connect the geographical distance. An online survey was conducted using Surveymonkey.com to obtain comparable and structured data, the results from these survey questions like multiple choices and rating scale questions needed to be analyzed quantitatively. In addition, due to the qualitative aspects of the research data such as interview results, the researcher could use a qualitative analysis method and data collection. Therefore, the mixed research method was designed to handle this research study.
3.2. Survey Process

There were 25 survey questions in the online survey via Survey Monkey. Most of the questions were single or multiple choice questions. The online survey questions were designed to find out the attitudes, behaviours and knowledge of the respondents towards the use of social networking sites in e-learning. The attitudes were identified by respondents’ opinions about what they thought about the use of SNS in e-learning. An example question in the online survey was “In your opinion, how relevant are social networking sites for e-learning?” The behaviours were reflected by respondents about what they were going or were going to do. Two example questions in the online survey were “Do you often use social networking sites to discuss course related topics with classmates?” and “Are you willing to use social networking sites for e-learning.” The knowledge gained was to investigate what respondents know about SNS in e-learning. This information was found from some questions in online survey such as “Does your department have an e-learning service such as Blackboard or Moodle?” or “Do you know what Web 2.0 technology is?” or “Do you often use social networking sites?” The final outcomes from the online survey were summarized to directly or indirectly provide answers to research questions. The final survey questions are attached in Appendix C. In order to collect data from the survey, the researcher designed a research matrix for the survey questionnaires that provide the details of which research question has been covered in the survey questions. This matrix is attached as Appendix E.

In order to obtain enough online survey responses, the program leader of the computing department at Unitec helped the researcher send an invitation letter to computing postgraduate and undergraduate students by email. This invitation letter included a web link of the online survey and information sheet. If computing students accepted to do this online survey after reading the information sheet, they then clicked on this web link to complete the online survey. Eventually, there were 60 online survey responses from computing students at Unitec. Each respondent should have answered 25 survey questions. The level of the completed survey question was over 80%. The candidate pool was around 300 students that included 250 undergraduate and 50 postgraduate students.
3.3. The Interview Process

Eight open-ended interview questions were designed to explore and investigate more deeply about the participants’ attitudes, perception and behaviours towards the use of SNS in e-learning. The final interview questions are attached in Appendix D. There were nine interviewees involved in this research study. The nine interviewees were from 60 survey respondents who agreed that they would be willing to be interviewed by answering survey question 25 “Would you be willing to be interviewed about social networking sites, Web 2.0 technologies and e-learning?” Before conducting the interviews, each participant was required to sign a consent form. Interviews were held on the campus where the participants preferred to be. Interviewees chose either a face-to-face mode, or an email interview. Four participants were interviewed through face-to-face, and five participants were interviewed with the researcher by email. Each interview was conducted in 30 minutes.

There were different answers to each interview question because of different interviewees, so it would be interesting to identify whether different background computing students have dissimilar attitudes and behaviours towards the use of SNS in e-learning such as the different qualification (postgraduates and undergraduates) computing students’ opinions in SNS for e-learning. In order to collect accurate data from the interviews, the researcher prepared a research matrix for the interview questionnaires to help the researcher understand the relationship between the research questions and the interview questionnaires. This matrix is attached in Appendix F.

The researcher endeavoured to collect the data and analyze the data for the 9 interviews in order to obtained answers to the research questions. However, it was hard for the researcher to ask research questions to the interviewees directly, because the participants may not have completely understood the research questions. If the interviewees were directly asked the research questions during an interview, the answers from interviewees might have possibly uncovered some aspect of the research design requirement.

The following Figure 3.1 describes the interview procedure for this research study.
Figure 3.1. The interview process
3.4. Data Collection Method

The purpose of data collection is to find answers to the defined research questions. Each question can be clearly linked to certain data collection element with the whole process of data collection. After all, the link between research questions and data collection tools is vital for the researcher to make sure that the research is properly completed.

In this section, a number of different ways of data gathering will be discussed in more detail. According to Creswell (2003), data collection can be divided into different parts based on mixed research method, which contain observations, documents, interviews, audiovisual materials, and questionnaire. In this research study, documents (literature review), interviews and questionnaires will be conducted into the process of research approach. The following information is shown in more detail:

First Step: Documents (Literature Review) ---- Secondary Data

Secondary data in this research mainly comes from academic resources including academic electronic databases, books, journals, and conference papers. At this stage, the researchers reviewed recent and past literature trying to identify existing issues, gaps and solutions regarding the defined research topic, main research questions, and sub research questions. Traditionally, the best literature resources are journals, books and conference papers; however, it does not mean that there was not good selection of literature from online resources. When some relevant literature was found, the researcher took some notes and highlighted these, and recorded key points and quotes.

In this stage, the collected resources were reviewed to provide background information for this research, and to assist in exploring and examining the growing use of social networking sites in e-learning so as to situate this thesis results in a wider context. The literature review can assist the researcher to attain useful information relevant to the research topic, and to know how much data could be found and how much could not be currently found, which may then collected from surveys and interviews. Meanwhile, a literature map was set up by the researcher and used to classify all found literature to help research further.
Second Step: Questionnaires and Interviews----Primary Data

In this phase, the primary data gathering for this thesis was accomplished by conducting an online survey (see Appendix C for the survey questionnaire) and interviews (see Appendix D for the Interview Questions) with computing students. Quantitative data was collected using a survey questionnaire (online survey) and qualitative data was collected via interviews.

All results of the online survey (via Survey Monkey) were fully obtained after the target responses were reached. The collected data from the online survey was downloaded in different formats such as Excel format and Word format.

It is popular to collect research data by means of interview method, and it is insightful and targeted for this research study (Ladner, 2008). The word “targeted” here means this research study focuses on the topic about the use of social networking sites and Web 2.0 technologies by computing students for e-learning. As the interview questions were designed to cover the stated research questions for this study, the gathered data (answers from interview questions) were targeted towards the research topic. “Insightful” here represents the gathered data from the interviews included personal perceptions and expectations. Since the interviewees were selected from 60 survey respondents who are computing students, it was assumed by the researcher that they had enough professional background to understand the research questions, and answer them. During the face-to-face interviews, the process of each interview was recorded by a digital recorder. In addition to email interviews, each email letter was kept in safe place. Since the interview questions were semi-structured, all the answers from interview questions were transcribed and backed up.

In short, a number of (face to face or email) interviews have been made to bridge geographical distance. Online surveys that comprise multi-choice and rating scale questions (quantitative analysis) and interview open questions (qualitative analysis) were used to obtain comparable and structured data. Interview data provided in-depth information and refined the survey results.
3.5. Data Analysis Method

There are two kinds of data in this research study: quantitative data (survey data) and qualitative data (interview result). Suitable tools and methods were used as data analysis for each type of data.

Quantitative Data Analysis (Survey Results)

Trochim (2006) indicated that: "statistics are always used to describe the basic feature of data in a study." Full results of surveys were obtained after enough respondents were received through SurveyMonkey website. In fact, all the data from the online survey was downloaded in different data formats such as Excel format and Word format. After that, all data was categorized according to participants' education level, namely: undergraduate and postgraduate. Then the researcher summarised to generate categories or themes including image, text, table, graph, or picture. This data was then analyzed and studied in different colour, graph, table and text by mean of some useful software (such as Microsoft Word and Excel), which will help the researcher identify the facts that can help to generate possible answers to the research questions.

As the results of the online survey were downloaded from Survey Monkey website by Excel format directly, Microsoft Excel 2007 was chosen to be the analysis tool in the present research study. Of course, there are also some tools available on SurveyMonkey website to help in the analysis of data. These Survey Monkey tools were appropriate for use in this research study, and the “Filter” tool especially was of much help to the researcher in analyzing the data based on respondents' answers. Although Excel’s equivalent tool is quite similar to the filter tool, the function of the Filter tool is more powerful and useful in this project. With the configuration of the parameters within a single filter, a set of survey results that met specific criterion would be seen clearly and easier to analyze. For example, the number of respondents who chose their qualification—postgraduates computing was selected out after filtering out the respondents whose qualification was postgraduate computing. Hence two parts of the results of the online survey that contained undergraduate and postgraduate responses in this research project were filtered out by study level. Additionally, Survey Monkey website also provided diverse ways for downloading
the data from the online survey via different patterns and figures: tables and graphic. The presented colour, patterns and figures could be customized by personal expectations. Each online survey question was also chosen to download as the appropriate figures or tables, and maybe some tables and figures would be compared to analyze as required.

Burke (2008) pointed out that, by comparing previous data from literature with recent experimental findings, trends to identify and analyze research questions further may be discovered. Consequently, in this research study, some related and similar results gathered from the online survey or well-known literature were compared and analyzed together by different tools such as Excel software or the Survey Monkey Filter tool. After comparing and integrating those data, new figures and graphics were generated in order to analyze the data.

**Qualitative Data Analysis (Interview Results)**

In order to identify and categorize the perception and expectations of the computing students regarding the use of social networking sites in e-learning, interview data analysis is essential for the researcher to complete this research study. “*The process of data analysis involves making sense out of text and image data. It involves preparing the data for analysis, conducting different analyses, moving deeper and deeper into understanding the data, representing the data, and making an interpretation of the larger meaning of the data*” (Creswell, 2003, p.190), which involves the following steps:

- Organize and prepare the data for analysis
- Read through all the data
- Begin detailed analysis with a coding process
- Using the coding process to generate a description of the setting or people as well as categories or themes for analysis
- Advance how the description and themes will be represented in the narrative
- Making an interpretation or meaning of the data.

Briefly, the researcher carefully looked through all data gathered from interview, and made sense as a whole. After that, the interview data in this research study was
distinguished by two categories: answers from undergraduates who use social networking sites in e-learning and answers from postgraduates who use social networking sites in e-learning. In the meantime, the researcher used the method of “coding” to generate categories or themes including images, text, tables, graphs, and pictures. For example, the notes and audiotapes recorded during each face to face interview were transcribed and backed up. The transcripts and notes were studied in more detail and classified into some themes such as usage, attitudes, and factors. This data was fed into some software (such as Microsoft Word, Excel, or Access) to be analyzed and summarized in different colour, graph, table, and text. Some tables and graphics were produced to help the researcher identify what information could be of use in answering the research questions.

3.6. Summary

The mixed research methodology (qualitative and quantitative research method) was chosen for this thesis. By means of mixed research method, more detailed information regarding computing students using social networking sites in e-learning could be collected to identify and analyse which social networking sites they often use in e-learning, why they use these sites and how they use these sites, what are their perceptions towards the use of social networking sites in e-learning.

In this research study, the chosen mixed research method contains Literature Review, Questionnaire, and Interview. The Literature Review is used to review current and past literature in order to collect the basic information about the research topic and questions, to find out some identified issues about the research topic, and to help understand this research topic deeply. Questionnaire and Interview in this research study are used to collect detailed and in-depth information to investigate and analyze, and find answers to the research questions.
4. Data Collection

4.1. Introduction

The data collection method has already been discussed in chapter 3, Research Methodology. Two types of data, survey results and interview results, are presented and analysed in this chapter. The survey data were gathered from 60 online surveys and the interview data were collected from nine interviews. Four interviews were conducted face to face and five by email depending on the preferences of individual interviewees.

The survey data were separately coded and organized by tools such as Microsoft Excel, Word, as well as selected tools from the online SurveyMonkey. The interview data were collected, summarized and coded to generate categories or themes.
4.2. Survey Data

- General information about survey participants
All online survey respondents were computing students at Unitec, and included postgraduate and undergraduate students. Out of a total population of about 300 computing students, 60 took part in the survey. Of these, 50 were male and 10 female. There were 19 postgraduate and 41 undergraduate respondents (See table 4.2.1).

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male students</td>
<td>50</td>
<td>83.3%</td>
</tr>
<tr>
<td>Female students</td>
<td>10</td>
<td>16.7%</td>
</tr>
<tr>
<td>Undergraduates</td>
<td>41</td>
<td>68.33%</td>
</tr>
<tr>
<td>Postgraduates</td>
<td>19</td>
<td>31.67%</td>
</tr>
</tbody>
</table>

Table 4.2.1: Basic information of survey respondents

- Awareness of e-learning, web2.0 technologies, social networking sites
Five survey questions were related to this topic, and each question was summarized as a table or figure to help with analysis.

Table 4.2.2 presents the percentage of respondents who were aware that e-learning services were available on campus.

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t know</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Yes</td>
<td>57</td>
<td>95%</td>
</tr>
</tbody>
</table>

Most respondents (95%) were aware that e-learning services were available on campus, which shows that most students were aware of e-learning.

The figure 4.2.3 below shows the responses to the question on whether e-learning is useful or not. Over 73% respondents strongly agree or agree that e-learning is useful. 8.3% respondents had neither positive nor a negative comment on this question. The rest of the respondents (18.3%) strongly disagree that e-learning is useful.
According to these 60 respondents, 25 participants (41.67%) were familiar with Web2.0 technologies. Only three of the 60 participants (5%) were not familiar with Web2.0 technologies. 19 participants (31.67%) said that they were somewhat familiar with Web2.0 technologies, and seven participants (11.67%) knew quite a lot about those technologies, and 6 participants said that they were not sure. (See Table 4.2.4 as below)

<table>
<thead>
<tr>
<th>Awareness Level</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiar</td>
<td>25</td>
<td>41.67%</td>
</tr>
<tr>
<td>Know quite a lot</td>
<td>7</td>
<td>11.67%</td>
</tr>
<tr>
<td>Know a little</td>
<td>19</td>
<td>31.67%</td>
</tr>
<tr>
<td>Not sure</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>3</td>
<td>5%</td>
</tr>
</tbody>
</table>

Table 4.2.4: Awareness of Web2.0 technologies among the respondents

According to the figure 4.2.5 which shows the percentages of respondents whether often use social networking sites or not, it is obvious that about 50 out of 60 (85%) Unitec respondents often use social networking sites such as FaceBook, MySpace,
and Flickr etc. Only less than 20% people said they did not often use social networking sites. (See Figure 4.2.5 as below) 

![Figure 4.2.5: Percentages of respondents who often use social networking sites](image)

Linked to the last figure 4.2.5., most respondents (over 60%) answered that they had been used social networking sites for more than three years. On the other hand, less than 18% people said that they used social networking sites for about one or two years. About 22% of respondents said that they used social networking sites between two and three years. (See figure 4.2.6 as below.)

![Figure 4.2.6: The number of year of respondents who have been using social networking sites](image)
• The relationships between social networking sites and e-learning

Two survey questions are related to this topic, which are shown as figure 4.2.7 and table 4.2.8.

With reference to figure 4.2.5., 50 of 60 participants often use social networking sites. Based on these 50 respondents, there are 5 out of 50 (10%) computing students who thought social networking sites are very relevant to e-learning. Another 17 (34%) students believed that social networking sites are relevant to e-learning. Additionally, there were still 16 (32%) computing students whose ideas were “neutral” on this issue. The rest of 12 (24%) computing students considered that social networking sites are not really relevant to e-learning. (See the following figure 4.2.7.)

![Figure 4.2.7: Relevance of social networking sites for e-learning](image)

According to figure 4.2.5., 50 of 60 respondents often use social networking sites. Based on these 50 respondents, a few of computing students (8%) always use social networking sites to discuss course related topics with classmates. Most computing students (34%) sometimes use social networking sites to discuss course material with classmates. Only 20% students stated that they seldom use SNS to discuss course
topic with their classmates. On the other hand, quite a few students (24%) said that they never use SNS to discuss course topic with their classmates. (See Table 4.2.8)

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>Often</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>17</td>
<td>34%</td>
</tr>
<tr>
<td>Seldom</td>
<td>10</td>
<td>20%</td>
</tr>
<tr>
<td>Never</td>
<td>12</td>
<td>24%</td>
</tr>
</tbody>
</table>

Table 4.2.8.: Frequency of the use social networking sites to discuss course related topics with classmates

- **Ways of discussing course related topics with others**

Most computing students discuss course related topics with other people by either Face to Face (87.8%) or Email (85.7%). The second level popular ways to discuss course material with other people are social networking sites and phone, which are 44.9% and 49%. There are only 14.3% choices to use other way to discuss course related topics with classmates, friends or lecturers. See the following table 4.2.9. The way of discussing course related topics with others.

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face to Face</td>
<td>43</td>
<td>87.8%</td>
</tr>
<tr>
<td>Social networking sites</td>
<td>22</td>
<td>44.9%</td>
</tr>
<tr>
<td>Phone</td>
<td>24</td>
<td>49.0%</td>
</tr>
<tr>
<td>Email</td>
<td>42</td>
<td>85.7%</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>14.3%</td>
</tr>
</tbody>
</table>

Table 4.2.9.: Ways of discussing course related topics with others

- **The current status of using social networking sites**

The following figure 4.2.10 show the social networking sites which respondents prefer to use either at home or on campus. FaceBook, MySpace, Wayn.com, Flickr.com, Secondlife.com, Bebo.com, Friendster.com, Linkdle.com, and Twitter.com were 9 popular social networking sites that the students usually visit. The first option for social networking site that computing students would like to use at
campus is FaceBook, followed by MySpace, Twitter and Flickr.com. FaceBook is also the first choice by computing students at home. This suggests that the FaceBook is the most popular social networking site used by computing students, after that, MySpace Twitter.com and Flikr.com also are attracting computing students’ attention.

![Figure 4.2.10.: Which social networking sites the computing students like to use](image)

- **Frequency of the use of social networking sites to find students to study with**

There are only 49 responses and the other 11 participant’s choice was to skip this question. More than half (51%) of these students said that they had never tried to find students to study through social networking sites. Only 7 out of 49 students said they always or were often on social networking sites to find students with whom to study. Less than one third (28.6%) of computing students stated that they sometimes use social networking sites with whom to find students to learn.

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>3</td>
<td>6.1%</td>
</tr>
<tr>
<td>Often</td>
<td>4</td>
<td>8.2%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>14</td>
<td>28.6%</td>
</tr>
<tr>
<td>Seldom</td>
<td>3</td>
<td>6.1%</td>
</tr>
<tr>
<td>Never</td>
<td>25</td>
<td>51.0%</td>
</tr>
</tbody>
</table>

Table 4.2.11: Frequency of the use of social networking sites to find students to study with
• **Factors that affect the use of social networking sites in e-learning at campus**

According to the answers from participants, about 61.9% respondents thought that the most important factor affecting the students to use social networking sites in e-learning at campus is network speed. Approximately 35.7% respondents believed that network access is the second factor. 31% respondents said that network security and privacy is a no neglected factor. There are also some students (9.5%) who considered other factors affecting the use of social sites in e-learning at campus. (See figure 4.2.12 :)

![Figure 4.2.12: Factors that affect the use of social networking sites in e-learning on campus](image)

• **Features of Web2.0, Websites, Social Networking Sites facilitate students’ e-learning**

There are three survey questions in relation to this topic, which are shown as figure 4.2.13, table 4.2.14, and figure 4.2.15.

To the survey question “What features of Web2.0 facilitate your e-learning” over 42 computing students thought online search was the most important features of Web2.0. The next highest choice was nearly 33 participants who said “Wiki”. 28 participants were aware of “online search”. 19 participants select “social network service”. In
addition, 9 participants wished it was “RSS” and only 2 participants preferred other features. In short, most of the surveyed participants believed online search (85.7%), online link (57.1%) and wiki (67.3%) facilitated their e-learning. (See figure 4.2.13)

Figure 4.2.13: Features of Web2.0 that facilitate e-learning

The following Table 4.2.14 illustrates that over half respondents (32) thought upload and watch ‘Video & photo’ is a feature of websites (including social networking websites) that facilitated their e-learning, followed by Mail (64.6%), Blog (58.3%), Forum (54.2%), and Chat Room (52.1%). Whereas, a few of the surveyed participants said that “event”, “Games”, and “other” were a feature of websites that facilitated their e-learning, with 10, 7 and 5 responses.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upload/Watch Video &amp; Photo</td>
<td>32</td>
<td>66.7%</td>
</tr>
<tr>
<td>Chat Room</td>
<td>25</td>
<td>52.1%</td>
</tr>
<tr>
<td>Games</td>
<td>7</td>
<td>14.6%</td>
</tr>
<tr>
<td>Forum</td>
<td>26</td>
<td>54.2%</td>
</tr>
<tr>
<td>Mail</td>
<td>31</td>
<td>64.6%</td>
</tr>
<tr>
<td>Blog</td>
<td>28</td>
<td>58.3%</td>
</tr>
<tr>
<td>Event</td>
<td>10</td>
<td>20.8%</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>10.4%</td>
</tr>
</tbody>
</table>

Table 4.2.14: Features of websites (including social networking websites) that facilitate e-learning
The following figure 4.2.15 shows that almost all the computing students had multiple choices to the question “What features of social networking websites facilitate your e-learning”. The features of social networking websites that most computing students prefer are Instant Messaging and View Friend’s Webpage & Blog, which are chosen by 35 participants (74.5%) and 28 participants (54.9%). Another three provided features of social networking websites (Add Friends, Make Friends, Create Group and Join Group) were respectively selected by 40.4%, 46.8%, and 46.8% computing students. Only 6.4% students chose the option “others”.

Figure 4.2.15: Features of social networking websites that facilitate e-learning

• Attitudes of the computing students in relation to the use of social networking sites in e-learning

There are four survey questions related to this topic, which are shown as figure 4.2.16, Table 4.2.17, figure 4.2.18 and figure 4.2.19.

The attitudes of the computing students in relation to the use of social networking sites in e-learning are clearly seen as optimistic and encouraging. More than half of
these computing students thought it was helpful for them in one course or more than one courses when they used social networking sites in e-learning, with 53.1% and 8%. On the other hand, there were still 39% computing students who did not accept it was helpful.

Table 4.2.17 shows that about half of these respondents (50.9%) may be willing to use social networking sites for e-learning and 40.4% respondents make sure that they would use it soon. In total over 90% respondents accepted the use of social networking sites in e-learning. Only 8.8% respondents did not have a plan to use social networking sites in e-learning.

<table>
<thead>
<tr>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>23</td>
</tr>
<tr>
<td>Maybe</td>
<td>29</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 4.2.17: Attitudes of being willing to use social networking sites for e-learning

The below figure 4.2.18 clearly showed a comparison of the methods where student would find the answer when they needed assistance with a related course, which include FaceBook, Blackboard, Wikipedia, Lecturers, Classmate and Google search. According to the diagram, the three most popular ways where students find answers
were Google search, your classmate and your teacher/lecturer. Google search was a very important choice at 61.8% and an important choice was 27.3%, followed by lecturers with 55.6% responses as very important and 40.7% responses as important, and ‘ask classmate for help’ was at 33.3% very importance and 52.6% importance. Over 80% of students neither use FaceBook nor care to use FaceBook for searching answers.

Figure 4.2.18: Ways of finding the answers when students need to answer a question related to their course

The next figure 4.2.19 illustrates what factors such as Security, Privacy, Blackmail and Bullying prevent computing student using social networking sits for learning. With regard to the diagram, the most important two factors that affect computing students using social networking sites for e-learning are security and privacy. Most of these computing students thought Privacy was very important concern with 58.9% and important concern with 30.4%, which was followed by Security with very important concern at 47.3% and important concern at 30.9%. In contrast, Bullying and Blackmail were two factors with only 20.4% and 24.4% that computing students said
were very important concerns. The percentages of saying important concerns were only 18.4% and 20.0% respectively in Bullying and Blackmail.

![Bar chart showing concerns](image)

**Figure 4.2.19: Reasons of preventing students from using social networking sites for learning**

- **Perceptions of computing students about the future of the use of social networking tools in e-learning**

There are two survey questions related to this topic, which is shown in figure 4.2.20 and figure 4.2.21.

According to figure 4.2.20, there are more than one third (38.8%) of computing students who agreed that the use of social networking tools in e-learning played an important role in the tertiary education sector in the future. Besides, over 14.3% computing students strongly agreed with this issue and about 24.5% computing students kept a neutral position. Nevertheless, there were 12.2% and 10.2% computing students who strongly disagreed or disagreed with the use of social
networking tools in e-learning in playing important position in the tertiary education sector in the future.

With reference to figure 4.2.21, there were 40.4% and 24.6% computing students who agreed and strongly agreed that tertiary institutions should make use of more e-learning in the future. In the meantime, up to 19.3% students made a choice to stand neutral on this issue. In contrast, it means that only 10.5% and 5.3% of the surveyed computing students strongly disagreed and disagree that their tertiary institutions should make use of more e-learning in the future. From the data for this survey question above, most computing students thought that tertiary institutions should make use of more e-learning in the future.
4.3. Interview Data

9 interviews were conducted and these 9 interviewees were selected from 60 survey participants. Each interviewee completed the online survey before starting their interview. Each interviewee read the information sheet (Appendix A.) and signed the consent form (Appendix B.) when the interview started. In the light of the preference of each interviewee, these nine interviews were carried out either face-to-face or email. There were four face-to-face interviews and five interviews by email. All data from these nine interviews were categorized and grouped in more detail to make sense of the whole information.

In order to prevent the participants’ confidential information from being identified in the research documentation that has been mentioned in the consent form (Appendix B.), each participant was given a unique code name instead of their real name. The researcher will use their code name to refer to these interviewees in the following section.
4.3.1. Interview Results [Undergraduates]

There were four interviewees studying the Bachelor of Computing Systems at Unitec. Two participants were studying full time and the other two interviewees were studying part time course.

➢ What are the advantages of using social networking sites for e-learning? Why?

Participant M:
Participant M thought Social networking sites allowed users to share ideas, activities, events, and interests within their individual social networks. Social networking sites were the perfect spot to meet new people to discuss what they were interested in studying.

The advantages of social networking were real, even though most parents see it as another way that kids waste time. Social networking for e-learning has opened up a new way to communicate, so while a child's studying posts may not be essential today, a child is still learning skills that could be very valuable tomorrow.

Participant P:
Participant P believed that the most important advantages of using social networking sites for e-learning was that many e-learning resource could be found from these social sites. They were good platforms provided for learners to study online and find useful learning materials. Social networking sites save study time and increase study efficiency more than traditional ways of studying.

Participant T:
Participant T felt that it was easy to collect different opinions: friends who were in social networking sites could give their opinions about a topic, and it was easy to collect valuable information: people could find more valuable information from social networking sites. This information could come from other sites.

Participant R:
Participant R said that it was a good way for users to communicate with each other through social networking sites, especially, to create groups through social networks.
People felt comfortable using email, Blackboard, or txt messages via social networks. Participant R used to use Google group with his friends to discuss course topic sometimes.

According to what four participants’ said, the researcher coded and summarized their idea about the advantages of using social networking sites for e-learning, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>P</td>
<td></td>
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<td></td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1- Share opinion  
2- Meet new people  
3- Communication  
4- Useful e-learning resource  
5- Studying efficiency  
6- Convenience and comfortable  
7- Group (collaborative) studying

➢ **What are the disadvantages of using social networking sites for e-learning?**  

**Why?**  

**Participant M:**  
Participant M thought that security was one of the top most current concerns for social networking sites. When social networking sites were used in e-learning, security issues were also an important concern. This was mainly because social networking sites allow users to display personal information such as name, location, and email address. There were some people who were always in search of a fake identity. If they obtained all the information about you on internet, they may use your identity for different types of illegal activities, which may cause you problems in future. It is always advisable to not provide your entire identity information online.

**Participant P:**  
Participant P said that it was hard to obtain an answer immediately when asking a question, and some online sources were not up to date in time especially for IT
technologies. Sometimes the servers of social networking sites were not 24 hours 7 days online.

**Participant T:**
Participant T felt that there were two disadvantages of using social networking sites for e-learning. **Waste time:** social networking sites need a lot of time to management. You cannot find valuable learning information although you spend a lot of time; **Authority:** most information is personal idea and not from academic education industry.

**Participant R:**
Participant R said that it was difficult to state disadvantages. Sometime he found it was hard to have conversations immediately through social networks. For example, sometimes he had problems in his study and wanted to ask his friends through FaceBook, however, his friend was not online and could not answer his questions. As a result, it does not suit everyone for e-learning on social networks.

According to what these four participants’ said, the researcher coded and summarized their idea about the disadvantages of using social networking sites for e-learning, which is shown as follow:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
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<tbody>
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<td>M</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1- Security and privacy issue
2- Hard to get answers immediately from SNS
3- Online resource not be updated in time
4- Waste time
5- Authority(learning resource)
What experiences do you have using social networking sites and/or Web2.0 technologies in e-learning?

Participant M:
Participant M experiences included using FaceBook forum to discuss assignments with other people, and using FaceBook to look for resources for his study.

Participant P:
Participant P did not have any experience with the use of social networking sites in e-learning, and only had the experience of using social networking sites such as FaceBook.

Participant T:
Participant T was using a FaceBook forum at present to learn job search skills such as interview skills.

Participant R:
Participant R had many Web1 experiences, and a little Web2 experiences. He was used to learning by Google group, FaceBook, Blog, online discussion, and watching videos online.

According to what these four participants’ said, the researcher coded and summarized their idea about the experiences of using social networking sites for e-learning and/or Web 2.0 technologies in e-learning, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>FaceBook</th>
<th>Other experiences about SNS in e-learning</th>
<th>No experiences about SNS in e-learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Discussion</td>
<td>Look Resource</td>
<td>Little used</td>
</tr>
<tr>
<td>M</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
➢ In your opinion, do social networking sites help in your e-learning now and future? If yes, how? If no, why?

Participant M:
Participant M answer was yes. He thought social networking sites assisted people in e-learning in the following four ways: “

• Work Connections
Social networking provides a great way for learner to keep in touch with other learner who may have moved away. Normally, people try to contact with their friends via phone and the occasional letter or e-mail, but busy lives make it hard to communicate with each other. However, social networking is such a regularly used medium that it’s simple to keep in touch with people even if they move away.

• Share Multiple Points of View
Social networking helps students learn about diversity and get exposure to multiple points of view. Ultimately, this exposure can help learner to learn to look at things from different angles, and be more tolerant of other people's opinions, things that go a long way in the working world.

• Talking to Other Students
Many student organizations have specific social networks designed to help students connect. Social networking tools can be a great way for students to get in touch with other students in the same school, or when they're considering a college or new school. Check with student organizations to see if they have a particular social networking tool, or type the school into your favourite social networking Web site and see what you find.

• Keep in Touch Anywhere
Mobile social networking is becoming increasingly popular as more and more people have cell phones capable of running social networking applications. People can use mobile social networking tools to stay in touch with friends, and make plans on the fly. Mobile social networking tools are also great if you've got a long train or subway commute and want to stay in touch with friends and find out what they're doing.”

Participant P:
Participant P answer was yes. He often went to online forums of social networking sites to find solutions to his study problems.
**Participant T:**
Participant T said that it was definitely social networking sites that helped him with e-learning. He obtained help from social networking sites, such as FaceBook, communication with friends on FaceBook and obtaining some learning help.

**Participant R:**
Participant R said “yes”, sometimes social networking sites helped his e-learning. Social networking sites created friendship like colleagues that kept in touch with group members. If a group member answered a question about his course topic, other group members could response with what they know.

According to what these four participants’ said, they all agreed that social networking sites helped their e-learning. The researcher coded and summarized their ideas of social networking sites helping their e-learning or not, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>P</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>T</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

1- Work connections (group studying)  3- Talk to other students  
2- Share multiple points of view  4- Keep in touch anywhere

How many people you know are using social networking sites? How many of them use these sites for e-learning? What are their attitudes to the use of social networking sites for e-learning?

**Participant M:**
Participant M said that a number of people around him had been using social networking sites such as Facebook and Twitter. Many of his friends especially students used these sites for e-learning since they could always find useful learning resources quicker than reading books. Therefore, they turned out to be positive about using social networking sites.
Participant P:
Participant P did not know how many people used e-learning online. Most of his friends and his colleagues had no experience with online e-learning. They often used Google to find solutions.

Participant T:
Participant T had over 200 friends on his FaceBook page and most were using it for e-learning. Their attitudes were definitely positive.

Participant R:
Participant R stated that according to informal news, there were a very large number of people (400 millions) around the world using social networking sites. He did not know how many people used these sites for e-learning, but he thought most people used it for communication. As a result, he believed their attitude to the use of social networking sites for e-learning was neutral because they mostly used social networking sites for communication.

According to what these four participants’ said, the researcher coded and summarized their attitudes to the use of social networking sites in e-learning, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>Lots of people use SNS</th>
<th>Lots of people use SNS in e-learning</th>
<th>Positive attitudes</th>
<th>Neutral attitudes</th>
<th>Negative attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
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<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

➢ Are there any features of social networking sites that affect your decision to use social networking sites to help with you e-learning? How do these features affect your decision? What features help your e-learning?

Participant M:
Participant M believed that there were many features of which the following were a few of them:
• Personal profiles. Create and customize a profile with certain content such as name, location, interests, website links, and more.

• Personal user image. Upload a user image to represent you on the social networking website.

• Communicate with text-based comments. Many social networks allow you to communicate with friends either by private e-mail-like correspondence, public message board-like posts, or both.

As talking about the benefits from the features, the following can be considered as important:

• Share personal story, success, services and products with the community on social networking website.

• The social community can put a face with personal name, and come to recognize you based on your familiar avatar.

• Stay in touch with contacts, reach out to new people, and show the community you care about company-to-client communication!

In terms of e-learning, the following features are important and most useful:

• Blogging,

• Chatting room

• Group

• bulletins

• e-Book collections

Participant P:
Participant P thought some features of social networking sites that affected his decision to use social networking sites to help with his e-learning, which made him satisfied with e-learning such as the feature: online forum.

Participant T:
Participant T said it was yes. There were two features of social networking sites he found useful. One was sharing information with each other through social networking
sites; another was publishing personal opinions that allowed people to publish their articles, video and pictures. Also, people could post their study problems to an online forum of a social networking site, and wait for someone answer their questions.

He believed that the most features to help e-learning his idea was that new information was updated as fast as possible, he could find friends, and friends management was effective.

Participant R:
Participant R felt some features of social networking sites that affected his decision to use social networking sites to help e-learning were instant messaging on FaceBook and online forum on Blackboard, which provided conversation for people instead of face to face meeting and direct communication with people. People just had to pick up and use it, which was necessary for course in which you were enrolled.

According to what these four participants’ said, they all believed that some features of social networking sites that affect their decisions to use it for e-learning. The researcher coded and summarized their idea about the features of social networking sites facilitating e-learning, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>Blogging</th>
<th>Chatting room</th>
<th>Group</th>
<th>Bulletins</th>
<th>e-book collections</th>
<th>Online forum</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<tr>
<td>P</td>
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<tr>
<td>T</td>
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<tr>
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<td></td>
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<td>Yes</td>
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</tbody>
</table>

➢ In your opinion, do the factors (such as network access, speed, security and privacy) encourage and discourage you using social networking sites in e-learning on campus? Why?

Participant M:
Participant M thought that fast internet access was the most important reason that could encourage learners using social networking sites in e-learning. Students could have 24 hours 7 day access to the internet at a school lab. Unfortunately, current
network speed and access at Unitec was not good. Sometimes it was very slow and hard to access the Internet.

**Participant P:**
In his opinion, when he expected to learn some knowledge from the Internet, these factors were not barriers him.

**Participant T:**
In his opinion, Unitec discouraged students from using social networking sites currently, because the network speed was too low, and some website could not be accessed because of security policies at Unitec.

**Participant R:**
Participant R said the mentioned factors neither encouraged nor discouraged anything.

According to what these four participants’ said, the researcher coded and summarized their idea about whether the factors (such as network access, speed, security and privacy) impact their on using social networking sites in e-learning on campus or not, which is shown as follow:

<table>
<thead>
<tr>
<th></th>
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<td></td>
</tr>
<tr>
<td>T</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

➢ Do you have any suggestions about the use of social networking sites for e-learning at present or future?

**Participant M:**
His suggestion had two points: one was the integration with other social networks so that all the users could share more and more resources. No matter how small or focused the community, it needed to integrate with the wider world (Facebook, Twitter, Linked-In). Another point was that Automatic import of contacts/friends
from standard services (above, plus email), so that new users could add and join much sooner.

**Participant P:**
Participant P said he had no idea. But he expected that he could choose a virtual tutor from the social networking sites as his tutor to learn something that could improve his knowledge.

**Participant T:**
Participant T pointed out two suggestions:
- Saving valuable information: saving valuable information to personal local computer when learners were studying on social networking site, otherwise it may lose useful knowledge, because that information would be removed from the website sometimes;
- Need to do enough research: it was better to do enough research when a learner was using social networking site for e-learning, because most content in social networking sites were personal opinions.

**Participant R:**
Participant R said: “one thing he was concerned with is Social networking joining the open source community”. It may make sure that data security and users could identify what happens with their personal data when they use social networking sites for e-learning.

According to what these four participants’ said, the researcher coded and summarized their suggestions about the use of social networking sites for e-learning now or future, which is shown as follow:

<table>
<thead>
<tr>
<th></th>
<th>Virtual Tutor</th>
<th>Authority(quality learning resource)</th>
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</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>P</td>
<td>Yes</td>
<td></td>
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<tr>
<td>T</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>
4.3.2. Interview Results [Postgraduates]

There were five interviewees who were studying at the postgraduate level in computing at Unitec. One participant was studying part time and the other were studying full time.

➢ What are the advantages of using social networking sites for e-learning? Why?

Participant S:

Participant S felt that the advantages were to discuss course topic by online discussion board and live chats through programs such as Twitter with friends and classmates. Also, they used sites (Facebook) as a shortcut to share answer and information online.

He said that it was easy to communicate with each other online, no physical distance limitation, save time, instant message. In a word, it allowed people to share any resources or experiences, and collaborate in many different ways for learning.

Participant V:

Participant V said that he was not very sure about SNS for e-learning. Most of time, when he used social networking sites (FaceBook), he just met friends, chatted with them, or caught up with them. He had not used any SNS for e-learning. In his opinion, he thought the advantage could be said to be shared ideas, just like group work.

Participant N:

Participant N said that the advantages were discussion topics, creating study groups, and managing group members. Because they were all free applications on most social networking sites and it was easy to access and use these for any purpose such as e-learning.

Participant B:

Participant B mentioned that there were four points about advantages, which are shown as below:

- Minimise and avoid the difficulty of physical distance of teaching and learning.
- Green ICT. Minimise the use of paper and petrol, thus saving natural resources and reduce green house gas emission.
- Ubiquity. Nowadays most of people have internet access at home and increasingly amount of people started to use social networking technologies for instance, Web 2.0. It makes the coverage of teaching and learning become larger.
- Cheaper fees. With the reduction of costs and the simplification of teaching and learning process, he guess the fee should be lower than choosing traditional ways of teaching and learning.

**Participant A:**

Participant A thought there were some advantages of using social networking sites for e-learning: to ask questions and obtain answers from friends or friends of friends through social networking sites, discuss with friends who were online to join a group with the same interests. This was because social networking sites could provide an easy way to communicate with friends if they were online. Those kinds of social networking sites allowed groups to be formed and members to join for free.

According to what these five participants’ said, the researcher coded and summarized their idea about the advantages of using social networking sites for e-learning, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
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<tr>
<td>N</td>
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<td></td>
<td>Yes</td>
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<tr>
<td>B</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</tr>
<tr>
<td>A</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

1- Share opinion                5- Studying efficiency
2- Meet new people              6- Convenience and comfortable
3- Communication               7- Group (collaborative) studying
4- Useful e-learning resource   

83
What are the disadvantages of using social networking sites for e-learning?

Why?

Participant S:
From his experience, he said that the most important issue was communication delay. When learners leave a message on an online board, he often waited one or two days to get the answer. For example, Participant S used to learn Linux through an online discussion board that was provided by a social networking site. When he had a question, he just wanted to get the answer immediately after he posted his question to the online discussion board and waited for other people to answer it. Unfortunately, it was impossible to get an answer straight away. Normally he often waited one or a few days to get an answer. Sometimes, after a few days he forgot to see whether any other people had answered his questions or not.

Participant V:
Participant V had no idea. That was because he had not used social networking sites for e-learning. However, in his opinion, he felt that the disadvantages were isolated space. In the course of e-learning, sometimes the learners may prefer to sit together to communicate, like face to face.

Participant N:
Participant N believed that the most important disadvantage was the privacy issue. That was because the use of social networking site for e-learning that mean that the leaner must use social networking sites, but some users liked to upload their personal and family’s photo, file, video. Sometime they did not want to share such material with others. That is privacy issue arose.

Participant B:
Participant B thought that there were three disadvantages:
1. Poorer interaction between students and teachers rather than fact to face. It was not as good as traditional learning in terms of physical interaction between students and teachers.
2. Quality of Internet connections. Lower quality Internet connection limited the learning experience. For instance, data delay, and loss of connection.
3. Performance of computers. There are a number of users still using lower performance computers to access Internet. As far as he had found, the graphic, animation and data processing of the Web 2.0 of e-learning consumed a large amount of system resources. Some computers could not afford this level of usage.

Participant A:
Participant A believed that time delay about answering questions was quite a large disadvantage. When a learner asked a question in their study group through the social networking sites, no people could answer this question at once because the other group members were not online.

According to what these five participants’ said, the researcher coded and summarized their idea about the disadvantages of using social networking sites for e-learning, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>B</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

1. Security and privacy issue
2. Hard to get answers immediately from SNS
3. Network access
4. Waste time

➢ What experiences do you have using social networking sites and/or Web2.0 technologies in e-learning?

Participant S:
As his friends often used Twitter and FaceBook, he was told to use it. Even if he did not know how to use many applications like FaceBook and Twitter, his friends could teach him how to use it. At present, he often used an online discussion board and live chats through Twitter and Facebook. It was more like the visual meeting places where people could hang out with friends. They could discuss, share course information, and exchange ideas about what they thought.
Participant V:
His experiences were only using Blackboard and Moodle. He had not done much for Moodle, which is open source, now he preferred to use blackboard (Whole Group discussion, send assignment, email) because it was more user friendly, he thought Moodle would be used rather than Blackboard in the future.

Participant N:
His experience was that he used MSN to discuss his assignment with his classmate when he was studying Bachelor of Information System one year ago. Also he sometimes used Blackboard and e-library.

Participant B:
He said he only had experiences with Unitec’s Blackboard and United Library and not much more than this with social networking sites.

Participant A:
Participant A said: “Social networking sites have wide information and a huge same interesting group. I used to learn with group member in the same interesting way.”

According to what these five participants’ said, the researcher coded and summarized their idea about the experiences of using social networking sites for e-learning and/or Web 2.0 technologies in e-learning, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>FaceBook</th>
<th>Other experiences abut SNS in e-learning</th>
<th>No experiences about SNS in e-learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Discussion</td>
<td>Look Resource</td>
<td>Little used</td>
</tr>
<tr>
<td>S</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

86
In your opinion, do social networking sites help in your e-learning now and future? If yes, how? If no, why?

Participant S:
Participant S said: “yes, we could find friend, add friend to talk about course topic by live chats or instant message etc. To set up studying group through social network sites, we might talk, communicate, discuss with each group member.”

Participant V:
Participant V really agreed that social networking sites could help e-learning now and in the future. For example, if his tutor wanted to give a piece of information to the whole class of students, the tutor preferred to put information on a social networking site such as wiki and provide web-link address for the students. Then the students might learn information online.

Participant N:
Participant N thought so, and said that most of his friends had an account for FaceBook and Google. They often communicated with each other via FaceBook, and sometimes they discussed their assignments as well.

Participant B:
Participant B thought it was not helpful for him now, but maybe helpful in the future. He was physically living beside campus and he was a lazy person, he felt it was too complicated to learn how to use Blackboard. He only used a limited amounts of features provide by Unitec’s Blackboard.

In the future, he thought if he needs to get education or training from somewhere, then he might form a discussion group with teachers and students online because they could not see each other very often. Then he may use social networking sites to diffuse is ideas and values about some concepts and educate people.

Participant A:
Participant A felt it was yes, and it did help in her e-learning now and future. She could find what other people said about knowledge she required.
According to what these five participants’ said, they all agree that social networking sites help their e-learning. The researcher coded and summarized their ideas of social networking sites helping their e-learning or not, which is shown as follow:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>V</td>
<td>Yes</td>
<td></td>
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<td>Yes</td>
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<tr>
<td>N</td>
<td></td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>B</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

1- Work connections (group studying)  
2- Share multiple points of view  
3- Talk to other students  
4- Keep in touch anywhere

- **How many people you know are using social networking sites? How many of them use these sites for e-learning? What are their attitudes to the use of social networking sites for e-learning?**

**Participant S:**

“That is quite a lot.” Participant S said. He thought about 90% of his friends used social networking sites. He also said that, it was about 15% of people that he knew were using these sites for e-learning. He believed their attitudes were quite positive. They were happy to use social networking sites for e-learning.

**Participant V:**

Participant V had not confirmed any user SNS for e-learning. He believed that there were lots of uses of social networking sites, but not many uses for e-learning. He had not come cross anyone who was using social networking sites for e-learning. He was on FaceBook and MySpace but had not come cross any uses for e-learning. He had than 250 friends through social networking; there were many people using social networking sites.

He thought it was a way that had not started yet. Once people were used to it, it could happen as well. For instance, Google’s, web technologies were “pretty smart”, “you don't have to buy a space, or anything from domain you create websites for own, it is brilliant what Google has started”.
Participant N:
Participant N estimated his friends all used social networking sites, but was not sure how many were using it for e-learning. However, he used FaceBook for e-learning while he was studying for his master of computing.

Participant B:
Participant B stated that hundreds of his friends were using social networking sites. Some of them were using it for e-learning, but he knew that at Unitec lots of students were using Blackboard and Web2.0 tools provided by Unitec’s library.

As far as he knew, most of them were positive about using social networking sites for e-learning. A few of them felt it was complicated to learn how to use it, including him

Participant A:
Participant A knew many people were using social networking sites. Half of them obtained knowledge from these sites. She did not know what percentages of them used it for e-learning.

According to what these five participants’ said, the researcher coded and summarized their attitudes to the use of social networking sites in e-learning, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>Lots of people use SNS</th>
<th>Lots of people use SNS in e-learning</th>
<th>Positive attitudes</th>
<th>Neutral</th>
<th>Negative attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Yes</td>
<td>Not many</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Yes</td>
<td>Not many</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Yes</td>
<td>Not many</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Yes</td>
<td>Not many</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Yes</td>
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<td>Yes</td>
</tr>
</tbody>
</table>
Are there any features of social networking sites that affect your decision to use social networking sites to help with you e-learning? How do these features affect your decision? What features help your e-learning?

Participant S:
Participant S felt that these feature such as Instant message, online discuss board, live chats were convenience for them. These tools are popular communication tools currently. Most of his friends are using these tools through FaceBook or Twitter. However, e-learning uses the features of: online discussion board and Instant Message of social networking sites. These tools provide an easy way for them to discuss the course topic. When they had a problem with their study, they could find, or add friends on FaceBook, and create a study group to discuss this course topic.

Participant V:
Participant V said that he did not use social networking sites for e-learning, so he did not know.

Participant N:
Participant N pointed out that creating and downloading his own page was a good function of social networking sites. He found that he could upload course materials to a social networking site, and then ask classmates and friends to update and modify these notes after reading them. They could also discuss some topics related to the course through social networking.

Participant B:
Participant B answer was no, and he said he had not found any features of social networking sites affecting his decision to use SNS for e-learning.

Participant A:
Participant A reflected that blog, forum, send email, and chat, were features that helped her with e-learning. These features made it easy to obtain information online.
According to what these five participants’ said, participant S, N and A believed that some features of social networking sites that affect their decisions to use it for e-learning. Participant V and B did not think that the features of social networking sites affect their decision to use it for e-learning. The researcher coded and summarized their idea about the features of social networking sites facilitating e-learning, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>Blogging</th>
<th>Chatting room</th>
<th>Group</th>
<th>Bulletins</th>
<th>e-book collections</th>
<th>Online forum</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
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<td></td>
<td>Yes</td>
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<tr>
<td>N</td>
<td>Yes</td>
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<td></td>
<td>Yes</td>
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<tr>
<td>B</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Yes</td>
<td>Yes</td>
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<td></td>
<td>Yes</td>
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</tbody>
</table>

➢ In your opinion, do the factors (such as network access, speed, security and privacy) encourage and discourage you using social networking sites in e-learning? Why?

**Participant S:**
In his opinion, network access and speed were not good. Participant S believed that the network access and speed were restricted too much. For example, the student used to download and upload study files on FaceBook at the computer lab on campus. If he could not download and upload anything or it cost too much time to finish, he used social networking sites in e-learning at home rather than at campus. Security and Privacy were another important issue. If he thought it was not safe to use FaceBook or Twitter in e-learning in a public place, there may have been some risk in disclosing his e-account information or “I do not want someone to see what I study, so I will not use it.” he said. Finally, in his opinion, security and privacy were the most important factors.
Participant V:
Participant V did not think network access could actually stop e-learning. Speed, however could stop it. Bad security and privacy definitely could do that because there was the sort of information that people were not supported to put on the Internet, so he thought privacy and security should be one of the key affects for this area. If the student had any e-learning websites like blackboard or any other module, the tutor would put the course material online. So the student could learn the course online. If you do not learn the course, you do not have the access to the e-learning website. Privacy and security were the two factors stopping him using social networking sites in e-learning.

Participant N:
His idea was the same as Participant V. He believed security and privacy were the important issues in this area.

Participant B:
The network speed at campus was sometimes an issue for participant B in using Unitec’s Blackboard. The speed was sometimes very slow and this discouraged him. Because he believed that most people had experienced this when they were spending half an hour to try to open the Blackboard Web page or upload files, which made people upset. However, he thought the important thing should be privacy and security.

Participant A:
Participant A thought it was ok. She was neutral on this issue. “Our campus computer should be used only for study, in this point I think it discourage students using social networking sites because a lot of other information there.” Participant A said. In other words, the network did not deny people access social networking. So for those who wanted to use the campus computers they were free to use them. In the meantime, she said the most concerning issues were security and privacy when she wished to use social networking sites for e-learning at campus. Because she did not want someone to see what she was studying.

According to what these five participants’ said, the researcher coded and summarized their idea about whether the factors (such as network access, speed, security and
privacy) impact their on using social networking sites in e-learning on campus or not, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>Impact</th>
<th>Neutral</th>
<th>No impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
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<td></td>
<td></td>
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<tr>
<td>V</td>
<td>Yes</td>
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<td>N</td>
<td>Yes</td>
<td></td>
<td></td>
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<tr>
<td>B</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Yes</td>
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</tbody>
</table>

- Do you have any suggestions about the use of social networking sites for e-learning at present or future?

**Participant S:**
Participant S hoped that social networking sites could provide more powerful functions for e-learning in the future. For instance, if people left a study message on an online discussion board, his entire group member could not get his message immediately as they may not have been available online. It meant that the group members would not answer and discuss the studying topic instantly. He wished social networking sites could support all 3G mobile not partly mobile. This meant that when users left a message on an online discussion board, all his group friends’ Mobile could receive a text message to know what the new study question in the group was. They could then access the sites on their mobile phones through social networking sites mobile pages for learning and discussion with their study topic.

**Participant V:**
Participant V hoped that social networking sites could provide more powerful features to help e-learning in the future. He believed that if this became more popular, more and more people would use it, and the more they were going to like it. The presentation of e-learning has to be in a way that was very friendly and adaptable. If not, no one would use it

**Participant N:**
Participant N wished that the developer could integrate e-learning system into FaceBook, and encourage many students to use it for e-learning in the future.
**Participant B:**
Participant B stated that at present, it definitely needed to supply more training and education for Web 2.0 on e-learning. There were a large number of people who did not use it because they felt that the new technology was too complicated to use. In the future, he encouraged organizations to investigate more in this field and to develop better, more simple-to-use, user-friendly Web 2.0 applications for e-learning. This could also be combined with other ICTs, such as HCI, VoIP and Video conferencing. In addition, participant B believed that Green ICT should be maximised to have a contribution to the “Green” aspect of ICT.

**Participant A:**
Participant A wished that people in the same class could form and join the same group in social networking sites to discuss and learn from each other. People could join groups to ask and answer questions about some subject. All social networking sites were free web spaces for people to use.

According to what these five participants’ said, the researcher coded and summarized their suggestions about the use of social networking sites for e-learning now or future, which is shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>3G mobile technologies support</th>
<th>More powerful features</th>
<th>Integrate e-learning system in SNS</th>
<th>Supplying training and education for web2.0 on e-learning</th>
<th>Developing online group study in SNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>V</td>
<td></td>
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<td>N</td>
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<td>Yes</td>
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<td>Yes</td>
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</tbody>
</table>
4.4. Summary

In this chapter, the results of 60 surveys and 9 interviews were presented. The data from 60 surveys could be categorized as quantitative data through SurveyMonkey.com statistical tool, and the data from nine interviews could be classified as qualitative data because of grouping and coding the whole answers from the interview questions from 9 interviewees.

The results of the survey were collected from each respondent through SurveyMoney.com that could be considered each as a particular case. The outcomes of each interview were gathered from each interviewee that was firstly divided into two groups: undergraduates and postgraduates, then coded into the responses from different interviewees for the same interview questions under each group. All data from surveys and interviews were summarized with key points, which will be analyzed to answer the research questions in chapter 5.

According to the current data results from survey and interviews, FaceBook is the most popular social website among computing students at Unitec. Most of the computing students enjoyed sharing events, live chat, meeting new people, uploading and downloading videos and photos. Some of participants also used FaceBook in e-learning such as online study groups and learning resource searches. Security and privacy issue were concerns of the users who used social networking sites in e-learning.
5. Data Analysis and Discussion

The purpose of data analysis is to find the answers to the research questions. In this study, 60 responses to the online survey and 9 interviews were analysed to assist the researcher in answering the research questions. The process of data analysis is to assist the researcher to address the final achievements of this research.

In this data analysis, the data from survey and interview will be analyzed to connect to the research questions through data integration and crossing comparison. Survey and interview questions were designed to answer the research questions, therefore, the results from the survey and interview were analyzed and summarized to generate the answers to the research questions.

Table 5.1. shows the relationship between research questions and survey / interview questions.

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Literatures/Survey Questions (SQ)/Interview Questions (IQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What social networking sites are used by computing students?</td>
<td>SQ12, SQ13, IQ3, IQ5.</td>
</tr>
<tr>
<td>2. What are the history development status and acceptance of social networking sites?</td>
<td>SQ6, SQ7, SQ8, IQ3, IQ4. Literatures:</td>
</tr>
<tr>
<td>3. What are the history development status and acceptance of e-learning?</td>
<td>SQ4, SQ5, IQ3, IQ4, IQ5. Literature:</td>
</tr>
<tr>
<td>4. What is the current status of the use of social networking sites in e-learning?</td>
<td>SQ9, SQ14, SQ19, SQ23, IQ3, IQ4, IQ5</td>
</tr>
</tbody>
</table>
5. What are the attitudes of computing students in relation to the use of social networking sites for e-learning? | SQ7, SQ8, SQ9, SQ10, SQ11, SQ21, SQ23, SQ24, IQ1, IQ2, IQ4, IQ5.
6. How will the factors affect the use of social networking sites for e-learning on campus? | SQ16, SQ24, IQ7.
8. What is the perception of computing students about the future of the use of social networking tools in e-learning? | SQ20, SQ22, IQ4, IQ8.

| Table 5.1. The relationship between research questions and survey questions and interview questions |

From Table 5.1 above, it can be seen that the data from the online survey and the interviews could be categorized and coded in accordance with the research questions. Therefore, this section will be divided into 8 parts to discuss the 8 sub-research questions. Each interview/survey question may help to answers multiple research questions.
5.1. Popular social networking sites used by computing students

According to the 60 responses of the online survey, all the respondents believed that FaceBook (nearly 100%) was their first choice social networking site either at campus or at home, followed by Twitter (around 30%), MySpace (about 18%) and Flickr (almost 15%). Meanwhile, some respondents also mentioned that they sometimes used social networking sites such as Friendster.com (2.20%), Wayn.com (2.20%), and Bebo.com (4.30%). Relating to the interview results, most of the interviewees (over 70%) said they often used FaceBook applications for e-learning such as looking for online resources for their study, discussing assignments with others, and downloading and uploading course materials. The data from interviews and online survey suggested that most computing students at Unitec sometimes used FaceBook in e-learning. Additionally, according to interview results, no obvious evidences showed that current participants used the non-popular social networking sites in e-learning. Based on these results, the social networking sites used by computing students could be divided into two groups: the most popular social networking site and non-popular social networking sites. The most popular social networking site was FaceBook; non-popular social networking sites included Twitter, MySpace, Flickr, Wayn.com, Friendster.com, and Bebo.com.

According to this research study and the literature reviews, the reasons why FaceBook was extremely popular social networking site have been identified: Firstly, Golden, Hughes, McCabe and Roberts (2009) claimed: “The main reason people use Facebook is that it is an effective communication tool. We assert that Facebook is not simply a fad, and has meaningful value as a communication platform.” It was a significant factor to push users to join and keep them participating. That is to say, communication is powerful in FaceBook and it has become a very popular communication tools on the internet. Apart from this valuable feature, FaceBook also provided different ways for users to use applications on social networking sites. For example, FaceBook applications, such as games, can encourage more online social activities. People can play poker online rather than face to face. Making use of
FaceBook’s gift feature, users can select and send one or more the virtual gifts to their friends. Secondly, another reason that makes FaceBook popular is that many users on FaceBook prefer to ask their friends use FaceBook as well. For example, the interviewee Participant S said he first used FaceBook because he was asked to use it by his friend. Everyone in his school has a FaceBook account, so he used it. They posted their social activities along with photo and video, so he could keep up to date with those who had joined. Ismail (2010) said that social influence was vital factor for students to believe that they should use social networking site as learning tools. In other words, the more students use social networking sites, the more their friends use the social networking sites. Thirdly, the last reason that made FaceBook so popular was that it provided a simple and fast way to create invitations for any sort of event. FaceBook also let users invite other people directly through their own FaceBook website. At the same time, users could keep track of their guests’ responses so as to monitor how many guests were attending or not. In brief, FaceBook could cross community boundaries. The invitation email could be sent to anyone from the users’ email list, which impelled FaceBook to improve the network to suit more users.

According to the survey results, even if FaceBook was the first choice amongst computing students, few of these computing students used the other social networking sites such as Twitter, MySpace, Flickr, Wayn.com, Friendster.com, or Bebo.com. Moreover, the data from the online survey and interviews did not show any evidences about why computing students used non-popular social networking sites besides FaceBook.

To sum up, based on current results from the online survey and interviews, social networking sites used by computing students could be divided into two groups: the most popular social networking site (Facebook) and non-popular social networking sites (Twitter, MySpace, Flickr, Bebo.com). The current social networking site in e-learning used by computing students was FaceBook.
5.2. History, development status and acceptance of e-learning

In my point of view, the history of e-learning could be divided into three stages: the first stage may be called the electronic devices period. The second stage may be called e-learning 1.0 and the third stage may be called e-learning 2.0.

In the first stage, the delivery content of e-learning include audio, videotape, interactive TV, and CD-ROM. “E-learning covers a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, and CD-ROM.” (Erskine, 2003, p3). E-learning is deemed to be learning done using tools or technologies such as a computer through a certain network, which provides us the chance to study anytime and anywhere. Any technology (tool) involved in e-learning could assist learning; it may be digital projectors, television, or computers. For example, e-learning in Tertiary education is often made in a specific mode to deliver any course related material and activities.

In the second stage of e-learning, the emergence of an e-learning management system means e-learning went into new era. In this time, many online tools were used in e-learning by students and instructors. E-learning management systems were a collection of online tools that could support teaching and learning. Heinrich, Milne, Crooks, Granshaw, and Moore (2006) claimed that “Today’s widely used learning management systems (LMS) such as Blackboard and Moodle, provide basic support around the management of assignments. These systems allow the lecturer to setup an assignment definition, the students to submit their assignments, the lecturer to access the student submissions and to return marked assignments, and the students to retrieve their marked assignments. Setting up an assignment definition includes the specification of parameters for due dates, extension periods or multiple submissions. The LMS relieves the individual lecturer of the responsibilities for secure access and safe storage. The student prepares the assignment outside the LMS, using general purpose tools, submits the assignment and receives results via a web-browser.
interface.” E-learning is a wide range term that could be any sort of learning environment enhanced by computer. Of course, many technologies are used in e-learning. When a computer was developed for practical personal use, e-learning started to be employed. The early use of computer was aimed at helping instructors who taught students in the classroom. With more and more personal computers being available, online classroom gradually began to be used. Graziadei et al (1997) said “a process of evaluating products and developing an overall strategy for technology-based course development and management in teaching-learning. The product(s) (currently Web-based) had to be easy to use and maintain, portable, replicable, scalable, and immediately affordable, and they had to have a high probability of success, with a long-term cost-effectiveness.” With the emergence of new technologies today, there are plenty of technologies suitably to be used in e-learning including blogs, virtual classroom, and collaborative software. Of course, most e-learning management systems in Education Industry use a combination of these technologies.

The third stage of e-learning is e-learning 2.0. The emergence of web2.0 has enabled changes for the needs of learners, new tools and ways to learn. It is time to consider the changing nature of e-learning as web2.0 has arisen. A Kaiser Family Foundation (2003) found that many young children were using social networking sites such as FaceBook and MySpace, Instant messaging tools like MSN and Yahoo Messenger, in order to share information, communicate with each other, or for fun. They also shared tips and advice when doing their assignments. Renner (2006) claimed that “second generation web applications (web2.0) are transforming e-learning and opening new frontier for learner empowerment, control and engagement. New online technologies allow individuals to filter and control existing content (aggregation), easily create new content (personal publishing) and rapidly communicate, inform and distribute this information with peers through online social service.” With a very large variety of online tools (blogs, wikis, podcasts and social bookmarking sites) assembled, a highly personalized learning environment was built up by the learner. Downes (2005) suggested that this phase of e-learning in combination with Web 2.0 (current trend in e-learning) be called e-learning 2.0. It focuses on the collaborative nature of e-learning, like learners creating study contents, and collaborating with others to form a learning network with distributions and responses. Effective e-learning 2.0 is taking
advantage of social network service where students can share their idea and discuss course contents with peers. Social space can be created based on existing social networks. Take Wiki as example, which provides a full-featured platform for students to post and edit each other’s content.

According to Greer (2010), the value of e-learning in the global market reached US$27.1 billion in 2009. The demand was forecasted to dramatically increasing with 12.8% compound annual growth rate (CAGR) of five-years. In the meantime its revenues are predicted to achieve $49.6 billion by the end of 2014. Ambient Insight (2009) predicted that North America would keep on being the largest e-learning market on the next five years. At the same time, Asia would overtake Western Europe in the following five years, with an incredible development, to reach the No.2 slot.

As the results from this research were gathered from the online survey, 95% computing students know the e-learning service in their service and over 73% of them thought that e-learning were useful for their academic study. Results obtained showed that most computing students accepted e-learning as a learning method in their tertiary studying when they knew there were e-learning services in their school. Meanwhile, most interviewees believed e-learning was useful. Only a few of the interviewees’ attitudes were neutral. The main reason that they were not willing to accept e-learning was due to complicated user interface of the e-learning system. Through categorizing and coding the results of interviews, the researcher found two of the four (50%) undergraduate interviewee’s attitudes were neutral and one of the five (20%) postgraduate interviewee’s attitude was neutral. This implies that in this sample, students studying at a different qualification level have a different knowledge about learning. Postgraduates computing students may have enough computing skills and knowledge to handle the complicated user interface of e-learning system. Therefore, most of them were happy to accept e-learning and thought e-learning was useful. Their attitudes were active and positive. Whereas, undergraduates computing student could not deal with the complicated user interface of e-learning system by themselves due to a lack of computing learning skills. Thus, some of these participants were not willing to accept e-learning. Half of them took a neutral attitude to e-learning. Hisham et al (2004) pointed out that some facts such as personalised feedback, content; interface and learning communication have an effect on students’ satisfaction with the
use of e-learning. Also, Keller, Hrastinski and Carlsson (2008) declared that “Individual background variables found to have an impact on students’ acceptance of e-learning are: gender, learning styles, age and organisational factors (i.e. school).”

Yiong, Sam and Wah (2008) summarized five factors, in accordance with past researches, that could affect students’ acceptance of e-learning. Those were “students’ and instructors’ characteristics, technology support and system, institutional support, course content and knowledge management, and online tasks and discussion groups”. Mason and Rennie (2006) explained the students’ acceptance of e-learning was playing an important role in fuelling the growth of e-learning in the education industry. With regard to a survey study of college students’ internet use in USA showed (Jones and Madden, 2002) that over 50% students thought that online communication provided good opportunities for them to share course related ideas with each others rather than expressing themselves face to face in class. More than 79% students believed that the use of the Internet had become more and more significant in their academic study experiences.

To sum up, combining the results from the online surveys and the interviews with literatures reviewed, most of the computing students in this study accepted e-learning and their attitudes were activate and positive, even if a few of these computing students took a neutral attitude to e-learning.

5.3. History, development status and acceptance of social networking sites

According to Raphael (2007), a time line of the history of social networking was:

- 1995 = Classmates.com founded
- 1997 = Six Degrees of Separation founded
- 1999 = Circle of Friends founded
- 2002 = Friendster.com founded
- 2003 = MySpace.com founded
- 2004 = Orkut.com founded
- 2004 = Facebook.com founded
2005 = Yahoo!360 founded

Meanwhile, authors’ research (2011) results indicate that Facebook being most popular social networking sites in the world from 2006 to 2011.

It could be called the Infant Years of social networking sites before the first identifiable social networking site named Classmate.com was established in 1995. At that time people mainly used BBS (Bulletin Board System) to communicate with each other via the Internet. For example, users could upload and download files and games, and read news and bulletin through BBS. BBSs were developing and thriving from the 80s to the 90s. With the Internet booming in the middle of 90s, social networking’s Adolescence was coming. The first social networking site in accordance with the definition of social networking was born. After a few of years, many social networking sites emerged like bamboo shoots after a spring shower. At present, the leading social networking site in the world is the FaceBook that was found in 2004. The initial idea of FaceBook was opened to campus-oriented area, to help students to make friends. After FaceBook was decided to be opened to the public in 2006 with the speedy growth of two years, it has been a successful business with a huge of million US dollar invested (Nickson, 2009).

The initial purpose to build up social networking sites on the Internet was to reconnect with former school friends. With the development and gain in popularity of social networking sites, it has been expanded to share files, photos, videos, music and information with each other. Certainly, people usually share their ideas and viewpoints of their life interest and culture through social networking sites.

“Supported by Web 2.0, now if anyone wants to ‘know’ they are more likely to go to Google or Wikipedia. Many, particularly young, consumers of news are cynical about what they read in newspapers or see on television. They read blogs from people on the scene, get personal opinions from postings on Myspace or Facebook, become immerse in virtual worlds on Second Life, interact on Twitter, see pictures on Flickr or videos on Youtube.” (Hasan & Ghose, 2009).

According to the results of 60 responses, 85% of these respondents knew Web2.0 technologies, and only 5% rest of respondents did not know Web 2.0 technologies. About 10% respondents said that they were not sure what Web 2.0 technologies were.
These results imply that most of the respondents in this research study have enough knowledge about Web2.0, therefore they should also know many social networking sites that are used by Web 2.0 technologies. The results of online survey question 7 and 8 showed that there were about 85% respondents using social networking sites such as FaceBook, MySpace, and Flickr. Most of them (over 60%) had used social networking site for more than 3 years. Furthermore, most of the interviewees (7 out of the 9 interviewees) said they had experiences using social networking sites and believed that using social networking sites helped in their e-learning experiences. Two out of nine interviewees had no experiences about SNS in e-learning, but they had e-learning experiences such as using Blackboard, Moodle and e-library. Some interviewees said that the reason why they used social networking sites was that their many friends use social networking sites now. For example, interviewee Participant S said he was told to learn using FaceBook because many of his friends’ demands. In other words, the more students use social networking sites, the more their friends use the social networking sites are required. According to Aimeur, Gambs and Ho (2009), social networking sites become popular because: “Most social networking websites let members design their profile page in order to express themselves and to reflect their personality. Another important part of the user’s profile page is his list of Friends, who are also members of the SNS. Through SNSs, users can keep in touch with friends and family, especially with people not seen on a regular basis, find old friends, contact friends of friends, even contact people they didn’t previously know at all. Some SNSs can also help users find a job or establish business contacts.”

According to Ismail (2010), students’ acceptance of social networking sites relies highly on four factors:

1. **Performance expectancy (PE)** is defined as the degree to which the students believe that using the SNS will help support their learning activities.

2. **Effort expectancy (EE)** is defined as the degree of ease associated with the use of the SNS.

3. **Social influence (SI)** is defined as the degree to which an international student perceive that it is important for others to believe that he or she should use the SNS.
4. **Facilitating conditions (FC)** represents the organisational support, which include the constructs of perceived behavioural control, facilitating conditions, and compatibility with other platform of technology.

These four factors enlarge the possibility for the use of social networking sites to support e-learning activities among tertiary students. Linked to the results of interviews, the reason why computing students at Unitec accepted social networking sites were social influence (SI): Students were asked by their friends who already had an account on social networking sites, to use the social networking sites. Also it implies that the purposes for using social networking site by computing students were joining social activities via social networking. At the same time, some computing students sometimes use social networking sites in e-learning. However, only FaceBook was used by some students in e-learning, there was no obvious evidence about the use of other social networking sites for e-learning by computing students in this study.

From the analysis above and literatures reviewed, it can be seen that currently most respondents (85% computing students at Unitec) would like to use social networking sites such as FaceBook, MySpace, Flickr. The acceptance of social networking sites was positive and encouraging.

5.4. **Current status of the use of social networking sites in e-learning**

According to the data from the online survey question 9, over 24% of participants believed that e-learning was not really relevant to social networking sites, and about 44% participant thought the relationship between e-learning and social networking sites was relevant. 32% of participants said that their relationship was neutral. It implied that more participants held positive attitude towards the use of SNS in e-learning. According to the online survey question 14, over 51% of participants claimed that they never found students to study together by social networking sites. It showed less than 50% participants used social networking sites for e-learning currently. Linked to the result of the online survey question 10, the data of online survey 14 suggested that most participants did not actively use social networking sites
for their study, and they would only use SNS for their study when encountering their study problem.

Additionally, according to online survey question 19, 60% of participants agreed that the use of social networking sites in e-learning may help them in one course or more courses. In the online survey question 23 and 24 most participates took their teacher or classmate or Google as their first choice when they needed to find an answer about studying. Social networking sites such as FaceBook only were taken as second choice to find an answer. Over half participants stated that the reasons that prevented them from using social networking sites for learning were privacy and security. Results from the survey show that most survey respondents wished to use social networking sites in e-learning. Unfortunately, only less than 50% responses sometimes used the social networking sites in e-learning at present.

After investigation and doing some research, the research summarized that the reasons why many students did not often use social networking sites in e-learning in this research. The first reason was that social networking sites did not provide enough applications for computing students to support e-learning. Current applications of social networking sites did not combine e-learning system well to develop web-based social learning system. Husband and Bair (2007) claimed that the core of current e-learning was collaborative learning such as a group of students writing on report within a wiki environment. Bader-Natal (2009) stated that “While many web-based learning systems connect students asynchronously, fewer systems focus on facilitating synchronous interactions among learners. Given the value of real-time communication – the social and motivational benefits of having a cohort of peers and the ability for a student to get immediate answers to pressing questions – it is perhaps surprising that more systems do not support interaction synchronicity.” Therefore, it could be said that the ideal web-based social learning is to develop synchronous and collaborative social learning system. If this ideal learning system exists on social networking sites, the students would be happy to use more social networking sites in e-learning. For example, students can contribute online feedback for quiz in e-learning and submit their assignments through LMS at present. Nevertheless, social networking sites still do not have this feature to help students contribute online feedback for quiz and submit their course assignments. On the other hand, e-learning
management systems (LMS) have developed to e-learning 2.0 over the past several years. Currently e-learning 2.0 systems were not available to all students because some schools did not update to an e-learning 2.0 system. Consequently, some students may lack knowledge of e-learning 2.0 systems. Even if some social networking sites had a number of features for e-learning, students did not have enough e-learning skills to use them. Thus, current computing students used social networking sites in e-learning infrequently although they may have accepted the use of social networking sites in e-learning.

Another reason may be called the authority issue. From the results of nine interviews, four undergraduates’ interviewees had some experience regarding using social networking sites such as FaceBook. Three of these students sometimes used FaceBook in e-learning such as search study resource, group discussion for course topic. Meanwhile, two of the five postgraduates’ interviewees had experiences using social networking sites in e-learning. Three of these students had some experiences about e-learning for Blackboard, Moodle, and the Library. The above observations suggest some differences in the nine interviewees. Undergraduate computing students were more likely to use social networking sites, so the percentage of using social networking sites in e-learning for undergraduate students was more than for postgraduate students. Undergraduate students did not mind where the study resource came from, whereas postgraduate students were concerned about the authority for the study resource and preferred to search academic resource to help their course study. Therefore, postgraduate students would like to find study resources from academic sites (Blackboard, Moodle, and the Library) rather than social networking sites, because information from social networking sites may not be an academic resource. In short, the higher qualification the computing students were studying, the less they searched for study resources from social networking sites. If the social networking sites could be combined with the current e-learning system well, this might mean that students could accept the authoritative status of the study resource and use any features of the e-learning system via social networking sites. In the meantime, the education industry also needs to instruct students’ e-learning skills to help students e-learning. Consequently, it could be predicted that more and more computing students will be using social networking sites for e-learning in the future.
Nine interviewees agree social networking sites helped in their e-learning now or future. For example, most of them (over 55%) used a FaceBook forum to discuss assignments with other people, looked for useful resources for studying, and learning job search skills. They said they kept in touch with other learners through FaceBook, shared multiple studying viewpoints, and found solutions for their study problems from online forums. Sometimes they could form a discussion group with teachers and students online because they could not see each other very often. They believed that many people in the world used social networking sites such as FaceBook, Twitter, and MySpace. Some of these (not many) students used these sites for e-learning. Therefore, the researcher believes their feelings are quite positive, and they were happy to use social networking sites for e-learning. Although they rarely used social networking sites in e-learning at present, they were willing to use social networking sites in e-learning currently or in the future. Although interactive educational options such as Blackboard exist, social networking sites were rarely used for academic purposes. (Pempek, Yermolayeva & Calvert, 2009)

To sum up, the above observations suggest the current status of the use social networking sites in e-learning is that most computing students at Unitec in this study are using social networking sites, and FaceBook is the most popular site. Although most computing students are willing to use social networking sites for e-learning now or in the future, only a few of these computing students are using social networking sites for e-learning. Additionally, there is no apparent evidence to confirm that other social networking sites except FaceBook are used in e-learning by computing students at present.

5.5. Attitudes of computing students in relation to the use of social networking sites for e-learning

In order to gain an understanding of the use of social networking sites by computing students for e-learning, we should take into account students’ attitude toward this issue. Smith and Mackie (2000, p247) found that attitudes are “cognitive representations that summarise an individual’s evaluations of particular objects”. White et al (2005) suggest that “Attitudes consist of both cognitive (beliefs and
knowledge) and emotional (influenced by values) elements that allow a personal evaluation of an object represented in the individual’s mind.” Using the data from surveys and interviews, an understanding of computing students’ attitudes towards the use of social networking sites in e-learning was gained.

The data from surveys showed that about 85% of participants often use social networking sites such as FaceBook, MySpace, Flickr, and most of them (over 60%) had used social networking sites for more than three years. From the data presented, it shows that two-thirds of the respondents often used some social networking sites, and social networking sites have become a part of their life. In addition, the data from online survey question 9 showed that over 44% of participants thought social networking sites were relevant to e-learning, and 32% of participants believed their relationship was neutral. Only 24% of participant said that social networking sites were not really relevant to e-learning. According to the online survey question 10, it showed that only 24% of participants never used social networking sites to discuss course related topics with classmates. These results above meant that most of the participants believed that social networking sites are relevant to e-learning, and they already started to use social networking sites helping their study. Lined to the result of online question 21, over 91% of participants said that they would use social networking sites for e-learning. Through these data above, it can be seen that the relationship between social networking sites and e-learning is a close connection for computing students study. The most of the computing students in this research are gradually use social networking sites for e-learning more and more.

According to survey results, although most of them (91%) were willing to use social networking sites for e-learning now or in the future, less than 50% participants currently used social networking sites in e-learning. Answers to survey question 24, 58.9% of respondents showed that they did not use social networking sites for e-learning due to security concerns. Answers to the same question also indicate that 47.3% of respondents did not use social networking sites for e-learning due to privacy concerns. These results implied that some reasons (such as security and privacy issue) led a few of respondents (less than 50%) to use social networking sites for e-learning, although 91% of respondents were willing to use SNS for e-learning now or in the
future. When these concerns are gradually solved now or in the future, the number of computing students who use SNS in e-learning will increase.

According to the results of interviews, nine interviewees presented some advantages of using social networking sites for e-learning: easy to communicate with other people, share ideas, studying efficiency, creating study groups to learn more collaboratively, useful e-learning resource. Some disadvantages were also presented by the nine interviewees: security and privacy issues, some online resource not up-to-date especially IT technologies, authority (learning resource), and communication delay (not synchronously). From interview questions four and five, all nine interviewees believed that social networking sites would help in e-learning in the future. For example, they can group studying, share multiple ideas, talking to other students and keep in touch anywhere through social networking sites. Six out of nine participants had a positive attitude towards the use of social networking sites in e-learning. Three out of nine participants just had a neutral attitude because they had no much idea about this interview question.

According to White et al (2005) attitudes’ theory linked to the results of the online surveys and interviews, it can be seen that these computing students at Unitec believe the use of social networking sites in e-learning is a time-saving and efficient learning method. They were happy to share their experiences and ideas with other people by collecting, retrieving, and sharing value studying resources from social networking sites. Although they rarely used social networking sites in e-learning, they were willing to explore ways of using social networking sites in e-learning in the future.

Due to the fact that some computing students believe that the use of social networking sites in e-learning has some disadvantages such as security and privacy, and communication delay (not synchronously), they thought that this may lead some of computing students to take neutral attitudes in relation to the use of social networking sites in e-learning. Thus, the researcher tried to find out the reasons why a few participants’ attitudes in relation to the use of social networking sites in e-learning are not positive currently. There are three reasons found as below:
Based on presented disadvantages of the use of social networking sites in e-learning, about 50% interviewees mentioned the same disadvantage: communication delay (not synchronously). Participant R said that sometimes he had some problem in studying and wanted to ask his friend through FaceBook, his friends were not online and could not answer his questions. Participant S said that he used to learn IT technologies through FaceBook. When had a question, he just asked group member from his study group on FaceBook. Unfortunately, it was normally impossible for him to obtain an answer right away because group members were not always online. Participant V and Participant A said that sometimes learners may prefer to sit together and learn together. Four interviewees all pointed out that communication delay (not synchronously) was a big problem while using social networking sites in e-learning. Thus, even if current computing students wished to learn course knowledge more effectively through online group discussion with synchronicity, their friends or studying group members were not always online to answer their questions straight away. According to Means, B., Toyama, Y., Murphy, R., Bakia, M., and Jones, K. (2009), their research provided sufficient evidence to suggest that students study in a blending learning group or online studying group performed higher rate than those of traditional classroom studying. Bader-Natal (2009) stated that: “one interesting observation noted in this work was that the retention rate of learners in the synchronous DE groups was higher than that of those in the asynchronous DE groups, suggesting that synchronicity may offer social or motivational benefits. Additional learning gains may be achieved simply by creating a more engaging learning environment in which students choose to spend more time, and real-time social interactions seem to provide a promising path to achieving this.” With the arrival of web 2.0 technologies, web-based collaborative learning provided more opportunities for students to fully control their own studying. They could not only be actively learners absorbing new information, but also combine previous knowledge with new knowledge. Learning with peer in online group (synchrony) cannot only help individual learner achieve their study goals, but also improve group team performance through synchronous online discussion. For instance, a group of students could write a group assignment together by wiki. Firstly, they could write down personal own personal ideas on in wiki webpage, at the same time, they may use FaceBook applications to communicate with other group members, and discuss the topic related to their assignment. After that, they could write and finish the report together based on
revised ideas and information from the wiki webpage. “While the motivation for supporting synchronous interactions among peers was primarily intended to provide a compelling social experience that motivated students to engage in learning collaboratively, it also had the effect of opening an interesting new set of questions.”

Bader-Natal (2009)

With the invention of the internet, security and privacy issues are always import issues of which the users of the Internet are concerned. Thus, when the instructor and learner start to use web-based learning, security and privacy also are taken into account. “Web-based learning systems are becoming popular in the recent years. Many courses and lectures are now conducted online. Similar to other web-based applications, security and privacy of Web-based learning systems should not be overlooked “(Chan, Leung and Liu, 2003). For example, Participant S said he would like to not use FaceBook in e-learning at public place because he did not want someone to see what contents he was studying(keep privacy), and he was afraid it may be threatened to disclosed his e-account information. According to the results of online survey question 24, security (58.9%) and privacy (47.3%) were two of the most important reasons that prevent the surveyed computing students from using social networking sites for e-learning.

The researcher summarized the third reason why 30% participants’ attitudes (data from interviews) were neutral: current social networking sites were not integrating e-learning systems well. For instance, a learner could download lecture notes via Blackboard; however, social networking sites could not provide the same function. This may therefore discourage users to use social networking sites for the purpose of e-learning. In the meantime, although e-learning 2.0 arrived, learners may not be familiar with e-learning 2.0 systems because of a lack of computing skills and knowledge. Briefly, integrating e-learning management system into social networking sites could be effective at enhancing learning ability, students’ satisfaction with their course, and interaction with others. E-learning on social media can possibly changes students’ learning performance from passive to active.
To sum up, the attitudes of computing students towards the use of social networking sites in e-learning were mostly positive, only 30% participants’ attitudes (data from interviews) were neutral.

5.6. Factors that affect the use of social networking sites for e-learning on campus

According to the results of survey question sixteen, the most significant factor affecting students towards the use of social networking sites in e-learning at campus was networking speed with 61.9%, followed by networking access (35.7%), security and privacy (31%). In addition, the result of survey question 24 revealed that security and privacy were most concerns that prevented these computing students from using social networking sites for e-learning. In short, the computing students were more concerned about network speed and network access when they wanted to use social networking sites for e-learning at campus. Certainly, the computing students also worried about the security and privacy issue when they used social networking sites for e-learning.

Security and privacy are significant issue in many ICT areas, however, these issues have been considered in the design and performance of social networking sites for e-learning. According to Chan, Leung and Liu (2003), “security threats become more severe when the learning venue is migrated to the networked environment.” For example, weak passwords could be easily broken by someone; when students use social networking sites for e-learning at computing lab, hackers may masquerade as the original users through copying session cookies from any networked computer with the same domain name. At the same time, Chan, Leung and Liu (2003) also said that privacy of users could be accomplished when taking web-based e-learning. An example from Chan Leung and Liu: “user specific information, such as student profiles, learning habit as well as examination performance must not be disclosed to unauthorized parties”. Therefore, it could be said that most of the current social networking sites are not flexible enough for users to stop the privacy risks even if they provide a few of privacy tools. In order to protect themselves, students should be
conscious about security and privacy risks during they using social networking sites in 
e-learning.

According to the interview question 7, all the interviewees presented their thoughts 
and concerns about the factors of their institution affecting their using social 
networking sites for e-learning. The undergraduates said that easy network access and 
fast network speed at campus were the most important reasons to encourage them in 
using social networking sites for e-learning. After that, they considered security and 
privacy issues. On the contrary, postgraduates believed that security and privacy were 
vital factors for them in using social networking sites for e-learning at campus. In 
view of keeping their e-account of social networking sites not disclosed when using it 
for e-learning at public place, the postgraduates wished to avoid using SNS at campus. 
At the same time, network access and network speed at campus were also taken into 
account by them.

In brief, in order to obtain useful information about a course through the social 
network, the undergraduate computing students care about network access and 
network speed rather than security and privacy. In contrast, postgraduate computing 
students preferred considering security and privacy issue than network access and 
network speed. Consequently, the higher qualification the computing students were 
studying, the more they were concerned security and privacy issues when using social 
networking sites for e-learning.

5.7. Features of social networking sites and Web 2.0 
technologies that help facilitate e-learning

According to the results of online survey question 15, 17, and 18, most of the 
surveyed respondents believed that online search (85.7%), online link (57.1%) and 
wiki (67.3%) were the most important web 2.0 technologies features facilitating 
e-learning. Upload/ Watch Video& Photo (66.7%) were an important feature of 
websites (including social networking websites) facilitates their e-learning. They also 
believed that Instant Messaging (74.5%), View Friend’s Webpage and Blog (59.6%) 
and Creating Social Group and Joining Group (46.8%) were the most social
networking sites features facilitating e-learning. These results from the online survey implied that the most of these features had the same point: communication, in particular synchronous communication. That is to say, communication such as synchronous communication was an important reason that helps facilitate e-learning.

In addition to that, seven interviewees confirmed the same opinions. They also provided more information about social networking sites features facilitating e-learning: live chat, and online forum. Only 2 interviewees had no idea in relation to social networking sites features facilitating e-learning, because they did not have experience in using social networking sites in e-learning.

Through data from online survey and interviews, the researcher found out that all related results could be categorized two ways: web-based collaborative learning and synchronous e-learning. Those features including Wiki, view friend’s webpage and blog, and online forum could be seen as web-based collaborative learning. The other features including Instant Messaging, group, and live chat could be taken as synchronised e-learning. Students could set up study groups based on the same studying interest. This kind of study group could support synchronised e-learning through instant messaging or live chat. At the same time, the instructor and the learner could view each other’s webpage/blog and discuss study topics by online forum to develop web-based collaborative learning. Husband and Bair (2007) declared that the centre point of current e-learning was collaboration learning such as a group of students writing a report within wiki environment. Web-based collaborative learning can facilitate learner’s studying performance and improve capability of studying creativity. Bader-Natal (2009) said that current web-based learning system mainly focussed on students asynchronously learning, and that fewer systems pay more attention to improving synchronous e-learning among students. It is possibly more valuable for students to obtain immediate answers to their questions through real-time communication (synchronised e-learning). This implies that current computing students hope social networking sites in e-learning having two key features: web-based synchronised learning and collaborative e-learning. If these two key features were integrated into social networking sites in e-learning, the students would be glad to obtain more chance to use social networking sites for e-learning. In short, it
could be said that ideal web-based social learning for computing students is to have synchronous and collaborative features.

To sum up, there are a number of features of social networking sites/web2.0 technologies that the respondents said could facilitate e-learning. In fact, it could be said that web-based collaborative learning and synchronised e-learning may facilitate e-learning if any features of social networking sites and web2.0 technologies have the function of web-based collaborative learning and synchronised e-learning.

5.8. Perception of computing students about the future of the use of social networking tools in e-learning

According to the results of online survey, over 50% surveyed respondents agree or strongly agree that the use of social network tools in e-learning will play an important part in studying at a tertiary level in the future. Meanwhile, about 65% respondents agreed or strongly agreed that tertiary institutions should make use of more e-learning in the future. Based on interview results, all interviewees agreed social networking sites helped their e-learning now or in the future. Participant P said that he often goes to online forums on social networking site to find solutions to his study problems. Participant T said that he usually obtained help from group members on FaceBook, and kept in touch with group members and helping this manner. Moreover, all interviewees had suggestions about the use of social networking sites for e-learning in the future. For instance, participant N advocated that the developer could integrate e-learning system into FaceBook and encourage students to use it for e-learning. Participant B suggested that much more training and education for web 2.0 on e-learning was needed because a large number of students lacked of e-learning 2.0 knowledge. Participant P hoped that social networking site could provide a virtual tutor for him to help his studying. According to all suggestions from interviewees, the researcher summarized three point: to enhance security and privacy concerns towards the use of social networking sites for e-learning, to integrate e-learning management system into social networking sites, and to develop powerful web 2.0 feature (function) of social networking sites helping e-learning 2.0.
Firstly, according to El-Khatib, Korba, XU and Yee (2003), “most e-learning innovations have focused on course development and delivery, with little or no consideration to privacy and security as required elements. However, it is clear from the above trends that there will be a growing need for high levels of confidentiality and privacy in e-learning applications, and that security technologies must be put in place to meet these needs.” The ‘savvy’ of learners concerning their rights to privacy has increased, and the new privacy policy on social networking sites or e-learning has also been launched by the developer. Additionally, the role of security contain: data integrity (avoid data corruption by attackers) and user authorization (keep users private information safe under authentication). It is obvious for learners that the confidentiality of personal information is important in web-based social learning activities. Why did all interviewees mentioned security and privacy issue with the use of social networking sites in e-learning? The researcher thought that most of the users hope to keep their personal information private and secure when they use social networking sites for e-learning. They do not want their e-learning data missing because of anonymous attackers from the internet. They do not want someone to know what they are studying by social networking sites. They do not want someone know their personal e-account information for a social network site. For example, participant S mentioned that he did not like someone see what he was studying on Facebook because he was afraid there was some risk in disclosing his personal e-account information. The researcher believes learners will not worry about security and privacy issue in the future with the advance in technologies, and they might have enough confidence to employ e-learning on social networking sites.

Secondly, the evolution of e-learning management systems has brought a large number of changes of functions, in particular, the function of communication and collaboration. Students can study more efficiently and effectively through e-learning systems. Meanwhile, current social network allow instructors and learners to build personal network with their friends and colleagues. They might keep in touch with each other through social networking sites such as Facebook. Therefore, to integrate e-learning system into social networking sites would be another way to help teachers and students achieve their education and studying purpose. Participant P expected he would choose a virtual tutor from the social networking site as his tutor to learn something in the future. Participant T suggested that given knowledge from social
networking sites would be more authoritative in the future because currently most contents in social networking sites were personal opinions. Why did some interviewees hoped to integrate e-learning system into social networking sites? The researcher thought current social networking sites mainly provided social network activities for users to make friends and keep their social relationships, which focussed more on entertainment, not learning. Even if instructors could create their personal social network with their students, and students could develop collaborative learning by the features of social networking sites, the existing features of most social networking sites did not have enough learning features to support social learning. For example, students could not submit their assignment through a social networking site. Students could not do online grade quizzes through social networking sites. Students could not directly download lecture notes from a social networking site. As mentioned above, students could only obtain them from the e-learning management system (LMS) such as Blackboard. Because most students are digital natives who are good at computing skills and often use social networking sites such as FaceBook, it would be one way to integrate e-learning system into social networking sites in the future. In the future, the users of e-learning management systems might login in with their Facebook ID and password. Students could confirm how many number of new posting on their Facebook wall through the e-learning management system. They might be able to retrieve course related data from the Facebook wall posting. They could submit their assignment, download lecture notes and do online grade quizzes through social networking sites.

Thirldly, according to Zhang, Racham and Firpo (2008), “Web 2.0 technologies such as blogs, wikis, podcasts, and other powerful tools for education can help strengthen students’ critical thinking, research, writing, learning, and reflective abilities, and engage students in a new world of information sharing and social learning.” Thus, it is important for instructors and learners to develop powerful web 2.0 feature (function) of social networking sites helping e-learning. When e-learning courses are used to enhance students’ learning interaction with web 2.0 technologies, this kind of new e-learning style is called e-learning 2.0. That is to say, e-learning 2.0 utilizes different tools that consist of courseware, online reference, and online search. It pays more attention to collaborative nature of learning by social network service. Based on data collected in this research study, the researcher thought that the core of developing
powerful web 2.0 feature (function) for social networking sites helped e-learning as synchronous collaborative learning. With web2.0 technologies used in social networking site, learners could establish their study contents and apply collaborative leaning with each other to form personal study groups or learning networks. At the same time, learners and instructors could also utilize synchronous learning by live chat or instant messaging of social networking sites. If this phenomenon (synchronous learning combined with collaborative learning by social networking sites) became more prevalent, this real-time social interaction learning would help learners achieve their study goals more rapidly. For example, when a learner answers a question on a social network site, and other students saw this answer immediately. When a student has a study problem, the full expert explains it at once by live chat or instant messaging. On the other hand, to enhance training and education for students is keep up date with the development of web 2.0 technologies. Thus, the learners might use e-learning 2.0 more effectively and efficiently to achieve their studying purpose.
5.9. Summary

The above data analysis and discussion section has presented the whole data results collected from surveys, interviews and academic literatures. It also showed the relationships between research questions and surveys, interviews questions, which helped the researcher look at each particular research question, and compare and summarise all data from different respondents in the interview or survey questions. The researchers analysed and discussed the data after coding and group it, then answered each of the research questions separately.

Social networking sites used by computing students at Unitec can be grouped into the most popular social networking site and non-popular social networking sites. The most popular social networking site is FaceBook; non-popular social networking sites include Twitter, MySpace, Flickr, Wayn.com, Friendster.com, and Bebo.com. Most of the computing students at Unitec in this study accept e-learning and their attitudes are activity and positive and only a few of these computing students took neutral attitudes to e-learning. In the meantime, currently most respondents (85% of these computing students at Unitec) preferred to use social networking sites such as FaceBook, MySpace, Flickr. The acceptance of social networking sites is positive and encouraging. Although most computing students are pleased to use social networking sites for e-learning now or in the future, only a few of these computing students were using social networking sites for e–learning. The attitudes of computing students in relationship to the use of social networking sites in e-learning were mostly positive. These computing students at Unitec are more concerned with network speed and network access if they wanted to use social networking sites for e-learning. Security and privacy issue also were taken into account. Any features of social networking sites having the function of collaborative learning and synchronous e-learning could facilitate e-learning. The perception of these computing students at Unitec about the future of the use of social networking tools in e-learning could be outlined in three points: to enhance security and privacy in relation to the use of social networking sites for e-learning, to integrate e-learning management system into social networking sites, and to develop powerful web 2.0 feature(function) of social networking sites helping e-learning2.0.
6. Conclusions, Limitation and Recommendations

6.1. Limitation of the Research

During the research process, some limitations of this research have been identified. There were only 60 respondents from undergraduate and postgraduate computing students at Unitec for the online survey, and only nine interviews were conducted by the researcher. This research was conducted over 12 months, and the research scope has been limited to complete the required goals. Some surveyed computing students were first year computing students so that they did not have enough computing skills and e-learning knowledge to answer the survey questionnaire properly.

6.2. Conclusion

The tertiary education industry has expanded into e-learning. Social networking sites have had an important impact on e-learning with the arrival of web 2.0 technologies. This research study systematically examines the status of the use of SNS and Web 2.0 technologies by computing students at Unitec for e-learning. The eight research questions concerned with the use of SNS and web 2.0 technologies by computing students at Unitec for e-learning were formulated in accordance with the preliminary literature review, and the researcher collected research data from participants through online survey and interviews. According to respondents’ opinions (attitudes, behaviours, knowledge) of the research area, the researcher made efforts to find the answers to the eight research questions. Meanwhile, the researcher took advantage of interview and survey matrix approach to answer eight research questions through data analysis and discussion. The most significant contribution of this research study was obtain a comprehensive understanding of the use of social networking sites and web...
2.0 technologies by computing students at Unitec for e-learning, and provided suitable recommendations for further research in the future.

There is increasing focus on the use of social networking sites in e-learning with the information era today, and some publications pointed out the practices and suggestions in this area. Tertiary education industry may need to pay more attention to the use of social networking sites in e-learning by computing students, and knowing students’ opinions (attitudes, behaviours and knowledge) at their study. The result of online survey and interviews in this research have indicated or implied more work to help computing students change and improve their opinions towards the use of social networking sites in e-learning is required. Some hints and advice for making use of SNS in e-learning effectively was presented in chapter 5, however, nine interviewees have also provided some valuable suggestions that were not found in the literature.

The results from this research study are strongly encouraging. Computing students at Unitec involved in the use of social networking sites for e-learning not only have a high level of comfort and satisfaction, but also their perceptions of advantages of the use of SNS in e-learning considerably exceeded disadvantages. Judging from the overall results from the online survey and interviews, it can be said that the use of social networking sites for e-learning is another way to help achieve study goals in contrast to face-to-face learning. It is significant to remember that overall results in this research were influenced by the respondents that were selected, both in relation to their qualification and in the clarity of their opinions.

FaceBook supported by web 2.0 technologies provides the potential for having an effective on classroom learning in a wide diversity of ways. Under some circumstances, computing students may discover helpful and enjoyable experiences (such as the use of social networking sites for e-learning) and study for longer, and therefore it becomes feasible that there may be greater learning possibilities connected to the use of social networking sites in e-learning. For example, social plugins supported by FaceBook are tools that allow users to see what their friends have shared or contributed on sites via the web.
The education industry provides an e-learning service to students, and the essential purpose of this service is for learners convenience and to take advantage of the affordances offered by e-learning. Social networking sites provide a social network platform for users to keep in touch with each other, join social activity and events. Different students have diverse expectations of the use of social networking sites for e-learning, and therefore education industry and developers of social networking sites should look again at how to satisfy students’ needs.

6.3. Recommendations for Further Research

According to this research, the use of social networking sites for e-learning is not widely used by computing students at Unitec. Although many computing students believe it is important for them, not every student thought it was necessary. Further research study could pay more attention to investigations into how to make the use of social networking sites for e-learning by computing students more effective, and what their tendencies will change in the future. In addition, the finally completed report of this research may help some tertiary students to research their studies further; also knowing the use of social networking sites by computing students will be beneficial if the adoption of Web 2.0 technologies and e-learning is being considered.

Further research might be done in different universities and polytechnics; in particular, further research needs to investigate those universities and polytechnics that do not have the use of social networking sites for e-learning at present. As different universities and polytechnics are located in different cities, the situation would also be varied. Thus, it is possible to explore the different situations at those universities and polytechnics without the use of social networking sites for e-learning. For example, what are the thoughts of students who are using e-learning without social networking sites? And their expectations of the use of social networking sites for e-learning. This type of data should be vital and valuable for increasing the use of social networking sites for e-learning at different tertiary institutes.

With the fast development of web 2.0 technologies, future research may be essential to identify the best ways of the use of web 2.0 technologies to improve e-learning
efficiency. In addition, further research also needs to keep update with the changes of situation.
References


Facebook (2010). *Facebook hits 500 million, aims for more growth.* Retrieved


Ladner, S. (2008). *Qualitative versus quantitative research, Part II.* Retrieved May 6,


Turvey, K. (2009). Pedagogical-research designs to capture the symbiotic nature of professional knowledge and learning about e-learning in initial teacher education in the UK. *Computers & Education 54* (3). Retrieved March 27, 2010 from Science Direct Database.


Yang, C. (2009). *Prototypes for open mesh services and user interface technologies.* Retrieved October 8, 2010 from http://www.google.com/url?sa=t&source=web&cd=1&ved=0CBsQFjAA&url=http%3A%2F%2Forbit.dtu.dk%2FgetResource%3FrecordId%3D248267%26objectId%3D1%26versionId%3D1&ei=_y0T77DjegsQOvysmaCA&usg=AFQjCNEyZaeWoW42ykReyLR3YPq06AmYLg&sig2=8fCw32ig7DXQWPeg0MhNw


**Appendices**

**Appendix A: Information for Participants**

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**Social networking sites, Web 2.0 technologies and e-learning**
I am a student enrolled in UNITEC’s Master of Computing Programme and completing my thesis. I invite you to participate in my research project which looks at the use of social networking sites by computing students for e-learning.

What it will mean for you
50 participants will be involved in this research project. The survey will be conducted online with Unitec computing students being emailed (via Blackboard) an invitation to participate. The first ten participants who say “yes” to survey 25 (“Would you be willing to be interviewed about social networking sites, Web 2.0 technologies and e-learning?”) will be invited to come for interview at a time and place that suit them after doing survey.

A few of categorical and single choice questions will be included in the research survey. Its will be about 25 survey questions and taken 10 minutes to finish. There are around 15 Open-ended interview questions be asked during the interview, which will be taken 30—40 minutes.

We want to interview you and talk for 30—40 minutes about the social networking site(s) you use for e-learning, how you use the site(s) now and your attitudes for e-learning. We will meet at a place and time that suit you. I would like to tape the interview for transcribing later.

Consent
Completing this research survey is taken as consent to participate in the research project. When the participants who say “yes” to survey 25 (“Would you be willing to be interviewed about social networking sites, Web 2.0 technologies and e-learning?”) will be invited to come for interview at a time and place that suit them after doing survey.

If you agree to be interviewed, you will be asked to sign a consent form. This does not stop you from changing your mind if you wish to withdraw from the project. However, because of our schedule, any withdrawals must be done within 2 weeks after we have interviewed you.

Confidentiality
The transcription of interview tapes will be done by researcher. If any other person is being asked to transcribe the tapes they are required to sign a confidentiality statement.

Your name and any information that may identify you will be kept completely confidential. All information collected from you will be stored on a password protected file and only you, the researcher and his supervisors will have access to this information.

Please contact me if you need more information about the project. At any time if you have any concerns about the research project you can contact my supervisor:

My supervisor is Xiaosong LI, phone 815 4321 ext. 6019 or email xli@unitec.ac.nz

UREC REGISTRATION NUMBER: (insert number here)
This study has been approved by the UNITEC Research Ethics Committee from (date) to (date). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 6162. Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix B: Consent Form

Social Networking Sites, Web 2.0 Technologies and E-Learning

This consent form will help us get information for a research project focus on understanding the use of social networking sites by computing students for Web 2.0 technologies for e-learning.

I have had the research project explained to me and I have read and understand the information sheet given to me, and I have had the opportunity to ask questions and have them answered.

I understand that I don't have to be part of this if I don't want to and I may withdraw at any time prior to the completion of the research project.

I understand that everything I say is confidential and none of the information I give will identify me and that the only persons who will know what I have said will be the researchers and their supervisor. I also understand that all the information that I give will be stored securely on a computer at Unitec for a period of 5 years.

I understand that my discussion with the researcher will be taped and transcribed.

I understand that I can see the finished research document.

I am aware that I or my parent or guardian may contact the Research Co-ordinator/Supervisor, Xiaosong LI at Unitec, (09) 815-4321 ext. 6019 if I have any queries about the project.

I have had time to consider everything and I give my consent to be a part of this.

Participant Signature: ………………………….. Date: ……………………………

Parent/Guardian Signature…………………… Date……………………………

Project Researcher: ………………………….. Date: ……………………………

UREC REGISTRATION NUMBER: (insert number here)
This study has been approved by the UNITEC Research Ethics Committee from (date) to (date). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 6162). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix C: Survey Questionnaire

This is a survey regarding the use of Social networking sites, Web 2.0 and E-learning.

*Please select the appropriate answer(s)*

1. What is your gender?
   - Male
   - Female

2. What is your major/specialisation?
   - Computing
   - Other (please specify) ___________

3. What is your highest completed qualification, in what programme are you currently enrolled?
   - Highest qualification_______________,   currently enrolled_________

4. Does your department have an e-learning service such as blackboard or Moodle?
   - Yes (please specify) ___________________________      Don’t know

5. E-learning is useful for my study.
   - a) Strongly Disagree
   - b) Disagree
   - c) Neutral
   - d) Agree
   - e) Strongly Agree

6. Do you know what Web 2.0 technology is? (e.g. this technology can make people upload, share, and disseminate information through the Internet)
   - Familiar
   - Know quite a lot
   - Know a little
   - Not Sure
   - Don’t know

7. Do you often use social networking sites? (e.g. FaceBook, MySpace, Flickr etc.)
   - Yes
   - No (Go to Question 21)

8. How long have you been using social networking site?
   - a) Never
   - b) Less than 1 year
   - c) 1---2 years
   - d) 2---3 years
   - e) More than 3 years

9. In your opinion, how relevant are social networking sites for e-learning?
   - a) Very relevant
   - b) Relevant
   - c) Neutral
   - d) Not really relevant
   - e) Not relevant at all

10. Do you often use social networking sites to discuss course related topic with classmates?
    - Always
    - Often
    - Sometimes
    - Seldom
    - Never
11. Which ways would you like more to discuss course related topic with your classmate, friend or lecturer? (You can choose more than one options)

   a) Face to Face       b) Social networking sites       c) Phone       d) Email
   d) Others (please specify) ______________

12. Which social networking sites do you use on campus? (You can choose more than one options)

   a) Facebook       b) MySpace       c) Wayn.com       d) Flickr.com
   e) Secondlife.com       f) Bebo.com       g) Friendster.com       h) Linkdle.com
   i) Twitter.com       j) Others (please specify) ______________

13. Which social networking sites do you use at home? (You can choose more than one options)

   a) Facebook       b) MySpace       c) Wayn.com       d) Flickr.com
   e) Secondlife.com       f) Bebo.com       g) Friendster.com       h) Linkdle.com
   i) Twitter.com       j) Others (please specify) ______________

14. Do you use social networking sites to find students to study with?

   Always       Often       Sometimes       Seldom       Never

15. What features of Web2.0 do you think that facilitate your e-learning? (You can choose more than one options)

   a) Online Search       b) Online Links       c) RSS       d) Wiki       e) Social Network Service
   f) Others (Please specify) ______________

16. Do any of the following affect your use of social network sites for e-learning at campus? (You can choose more than one options)

   a) Network Access       b) Network Security and Privacy       c) Network Speed
   d) Others (please specify) ______________

17. What features of websites (including social networking websites) that facilitate your e-learning? (You can choose more than one options)

   a) Upload/Watch Video& Photo       b) Chat Room       c) Games       d) Forum
   e) Mail       f) Blog       g) Event       h) Others (Please specify) __________

18. What features of social networking websites that facilitate your e-learning? (You can choose more than one options)
a) View Friends' webpages/blogs etc.  
b) Add Friends  
c) Make Friends  
d) Create Social Group and Join Group  
e) Instant Messaging  
e) Others (Please specify) _________

19. Does the use of social network site(s) in e-learning help you in one course or more than one course?

a) Some courses  
b) Only one course  
c) None

20. In your opinion, use of social network tools in e-learning will play an important part in studying at tertiary level in the future.

a) Strongly Disagree  
b) Disagree  
c) Neutral  
d) Agree  
e) Strongly Agree

21. You are willing to use social networking sites for e-learning.

a) Yes  
b) Maybe  
c) No

22. In your opinion, tertiary institutions should make use of more e-learning in the future.

a) Strongly Disagree  
b) Disagree  
c) Neutral  
d) Agree  
e) Strongly Agree

23. When you need to find the answer to a question related to your course, where do you go to find the answer? (Ranking question)

| FaceBook | Very Important Choice |
| Blackboard/ Moodle | Important Choice |
| Wikipedia | Doesn't Matter Much |
| Your Teacher/ Lecturer | Not Important |
| Your Classmate | N/A |
| Google | |
| Other Websites (please specify) | _____________ |

24. What concerns do you have that prevent you from using social networking sites for learning? (Ranking question)

a) Security  
b) Privacy  
c) Bullying  
d) Blackmail  
e) Others (please specify) _____________

25. Would you be willing to be interviewed about social networking sites, Web 2.0 technologies and e-learning? (It will take about 20 minutes)

Yes (please email topcpu2003@hotmail.com)  
No
Appendix D: Interview Questions

1. What are the advantages of using social networking sites for e-learning? Why?
2. What are the disadvantages of using social networking sites for e-learning? Why?
3. What experience do you have using social networking sites and/or Web2.0 technologies in e-learning?
4. In your opinion, do social networking sites help in your e-learning now and future? If yes, how? If no, why?
5. How many people do you know that are using social networking sites? How many of these people use these sites for e-learning? What are their attitudes to the use of social networking sites for e-learning?
6. Are there any features of social networking sites that affect your decision to use social networking sites to help with your e-learning? How do these features affect your decision? What features help your e-learning?
7. In your opinion, do the factors (such as network access, speed, security and privacy) encourage or discourage you using social networking sites in e-learning on campus? Why?
8. Do you have any suggestions about the use of social networking sites for e-learning at present and future?
Appendix E: Matrix (Research Question & Survey Question)

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RQ = Research Question,    SQ = Survey Question, IQ=Interview Question
Appendix F: Matrix (Research Question & Interview Question)

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*RQ = Research Question,  SQ = Survey Question, IQ=Interview Question*