ASSESSING THE AWARENESS AND PERCEPTION OF STUDENTS IN USING E-LEARNING TOOLS IN A TERTIARY EDUCATION: A CASE STUDY ON SUNWAY UNIVERSITY MALAYSIA

By

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ABSTRACT

ASSESSING THE AWARENESS AND PERCEPTION OF STUDENTS IN USING E-LEARNING TOOLS IN A TERTIARY EDUCATION: A CASE STUDY ON SUNWAY UNIVERSITY MALAYSIA

Sophia Latt btn Hj.Hasan Latt @ Hnin Wai Latt

The aim of this project is to investigate the use of e-learning tools among students in one of the private universities in Malaysia, namely Sunway University. Specifically, this study is intended to examine the opinions of students towards e-learning tools by investigating their awareness and willingness to use e-learning tools and to examine the perceptions and challenges they faced using e-learning tools. A total of five schools have been chosen for the study, namely School of Computer Technology, School of Business & Law, School of Creative Arts & Communication, School of Health & Natural Sciences and School of Hospitality, Tourism & Leisure Management. All the schools fall under the umbrella of Sunway University entity.

A theoretical framework called "**Learner –centered framework for e-learning by McCombs"** is used as a guide to determine the significant relationship between e-learning and four domain factors identified by the framework, namely cognitive and meta-cognitive factors, motivational and

affective factors, development and social factors and individual – difference factors. The outcome from this study is to find out whether are there any significant relationship between the four domain factors identified by the framework and the usage of e-learning tools. Questionnaires are derived from the framework and are designed to test hypothesis regarding the four domain factors identified by the framework. The results from the questionnaires are used to determine the viability of the proposed hypothesis. An analysis of these results and their relevance to the current research in this area, as well as the current situation in four Malaysian universities is conducted. Directions for future work will be identified as well.

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The completion of this degree would have not been possible if not for the support and advice of a number of important individuals. First and foremost, I would like to thank GOD, ALLAH S.W.T for blessing me. A million of thanks should go to my master dissertation supervisor, Dr. Siew Pei Hwa for her dedication and patience in supervising. Dr. Siew was more than generous with her time. She was always available to read through and edit the chapters, and get it back to me rapidly with invaluable advice and recommendations. Without her dedicated supervision, I would not be able to complete my dissertation on time. I would like to also thank the Head of Programme (Information Systems), Dr. Victor for his motivation and inspiration in completing my master on time.

This study was made possible because of the support and help from head of departments and lecturers in Sunway University. It was an honor working with them. They have always been supportive of my academic aspirations, and have provided valuable assistance in the construction of this work. Without the consent of the staff, the questionnaire data would never have been collected, so my utmost appreciation goes out to each and every participant. Your help was much appreciated. Sincere appreciation goes out to my husband, Saddique Khan, my son, Saifullah and my sister, Rubiah Latt for all their love and support, as this endeavor would not have been possible without their great strength. Words truly do not do justice to the gratitude I have for their love, support, and understanding during this arduous journey.

APPROVAL SHEET

This dissertation/thesis entitled "**ASSESSING THE AWARENESS AND PERCEPTION OF STUDENTS IN USING E- LEARNING TOOLS IN A TERTIARY EDUCATION: A CASE STUDY ON SUNWAY UNIVERSITY MALAYSIA"** was prepared by SOPHIA LATT and submitted as partial fulfillment of the requirements for the degree of Master of Information Systems at Universiti Tunku Abdul Rahman.

Approved by:

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Universiti Tunku Abdul Rahman

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UNIVERSITI TUNKU ABDUL RAHMAN

Date: 29.05.2012

SUBMISSION OF DISSERTATION

It is hereby certified that **Sophia Latt Btn Hj.Hasan Latt @ Hnin Wai Latt** (ID No: **08UIM08079)** has completed this dissertation entitled "**ASSESSING THE AWARENESS AND PERCEPTION OF STUDENTS IN USING E-LEARNING TOOLS IN A TERTIARY EDUCATION: A CASE STUDY ON SUNWAY UNIVERSITY MALAYSIA**" under the supervision of Dr. Siew Pei Hwa (Supervisor) from the Department of Multimedia Design & Animation, Faculty of Creative Industries.

I understand that the University will upload softcopy of my dissertation in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

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Sophia Latt Btn Hj.Hasan Latt @ Hnin Wai Latt

DECLARATION

I Sophia Latt Btn Hj.Hasan Latt @ Hnin Wai Latt hereby declare that the dissertation is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

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(SOPHIA LATT)

Date 29.05.2012

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LIST OF ABBREVIATIONS

APA	American Psychological Association
AVI	Audio Video Interleave
BB mobile	Blackboard mobile
CD-ROM	Compact Disc Read-Only Memory
GPS	Global Positioning System
IT	Information technology
P.D.A	Personal Digital Assistant
JAS	Java Assisted SMIL
Java GUI	Java Graphical User Interface
JMF	Java Media Framework
MSC	Multimedia Super Corridor
PDF	Portable Document Format
SCT	School of Computer Technology
SCAC	School of Creative Arts & Communication
SUBS	Sunway University Business School
SHNS	School of Health & Natural Sciences
SHTLM	School of Hospitality, Tourism & Leisure Management
SMIL	Synchronized Multimedia Integration Language
SPSS	Statistical Package for Social Sciences

CHAPTER 1

INTRODUCTION

1.1 Introduction

Computers have become the most important tool not only to the businesses but also to the education arena. The connection between computers and the World Wide Web become the secondary library of the students and through it, the students not only able to develop their communication skills but also able to gather tremendous knowledge and skills within a short time. E-learning is also best described as an online learning and the networked learning. Through the usage of computer based education, computer based instruction, and computer supported learning, the distance or obstacles in education are not more a limitation to University students (Coldwell, 2008).

The adoption of e-learning tools has developed tremendously in higher education (Long, 2006). These e-learning tools range from blogs, wikis, instant messengers, social networks, podcast, vodcasts, blackboards, and so forth. With the creation of these e-learning tools, the Web is transforming into an interactive space and control of content that has been decentralized to allow the learners to collaborate, create, publish, subscribe, and share information (Saeed & Yang, 2008).

Rate at which institutions are looking into e-learning tools are increasing rapidly but yet, there are many researchers and practitioners have lacked in identifying the suitable research validated framework.

This study aims to assess the level of awareness and perception of university students towards the use of selected e-learning tools such as Blackboard E-learn, search engines, instant messaging, YouTube, Microsoft Power Point, Facebook and email in campus-based classrooms. It also investigates the relationship between the four domain factors in the McCombs's learner-centred framework (i.e. cognitive and meta-cognitive, motivational and affective, developmental and social, and individual-difference factors) and the use of e-learning tools among university students. So far, no research has been done in Sunway University to examine the awareness and perception of students on the use of selected e-learning tools.

1.2 Background of the Study

The growing interest in e-learning seems to be coming from different directions such as corporate and educational sectors. Corporate sees e-learning as a tool to save cost in terms of training and travelling to the learning centre. (Bassi, 2010) As from the educational point of view, it is an additional access to improving the teaching and learning process and to provoke a better communication between the teachers and learners.

In this study, Sunway University has been chosen as the ground for information gathering and collection of data. Information to be gathered is to assess the level of awareness the students have towards e-learning tools and their perception on the e-learning tools. Sunway University, which is situated in Bandar Sunway, has been established since 1987. Started its business in Petaling Jaya, it moved to Bandar Sunway in 1991 with just few courses such as A-Levels and other pre-University programmes such as Canadian matriculation programme, Business Diplomas, to name a few. Now it has numerous additional home-grown degree courses which have been running for a couple of years now. Formerly known as Sunway College, it has changed its name to Sunway University College between the year of 2003-2005 after getting the MSC status from the Ministry of Education and MSC Corridor organisation in Cyberjaya.

At the end of 2010, Sunway University College has upgraded its status to Sunway University after being certified by Ministry of Education for providing high- quality education. Since the institution is still providing pre-University courses, that cannot be offered under the umbrella of Sunway University. Therefore, the directors have decided to divide the institution into two entities namely Sunway University for home-grown degree courses and Sunway College for pre-University courses. Both companies came under the umbrella of Sunway Education Group (Human Resource Div., 2012). This study is only targeted at Sunway University students.

So far, Sunway University lecturers are heavily using word processing and presentation tools such as Microsoft Word and Microsoft PowerPoint. Microsoft Word is usually used to create notes, assignments and tutorials, whereas Microsoft PowerPoint is used to create lecture slides. Some of the lecture slides are available as instructor resources from book publishers (W.N. Lim, personal communication, January 15, 2012). These course materials are uploaded to a resource web site called Blackboard E-learn as shown in Figure 1.1. Blackboard E-learn is an official learning system proposed by the University.

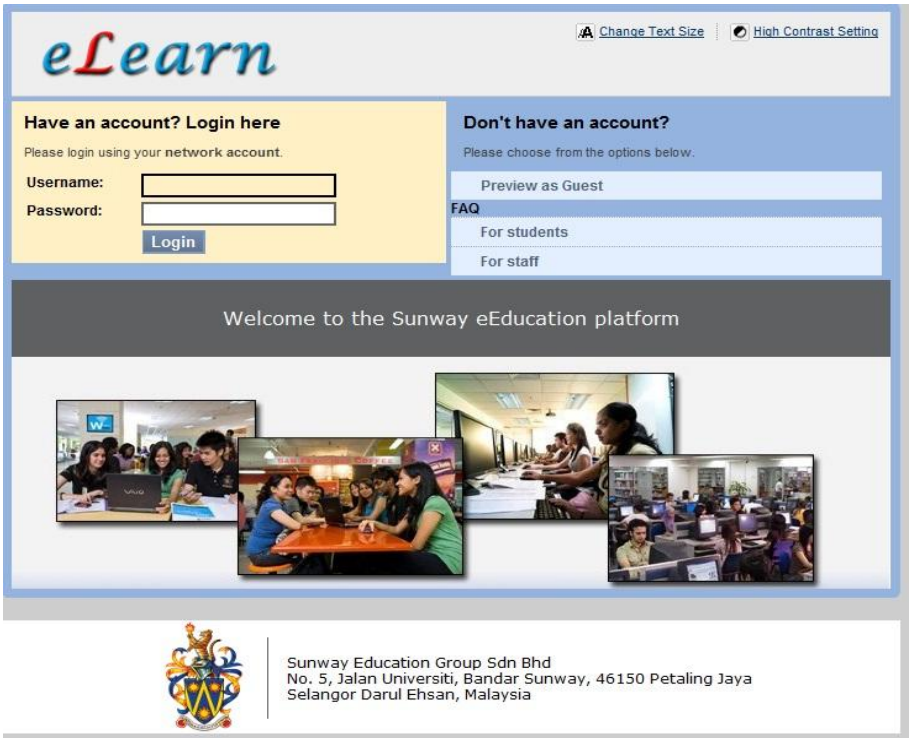


Figure 1.1: Screenshot from the login page of Blackboard E-learn (http://elearn.sunway.edu.my)

Meanwhile, Sunway University students are using Blackboard E-learn to retrieve course materials, assignments, announcements and view grades

posted by lecturers. Figure 1.2 shows a sample screenshot from Blackboard E-learn which reveals the lecture slides uploaded by a lecturer for the students to download.

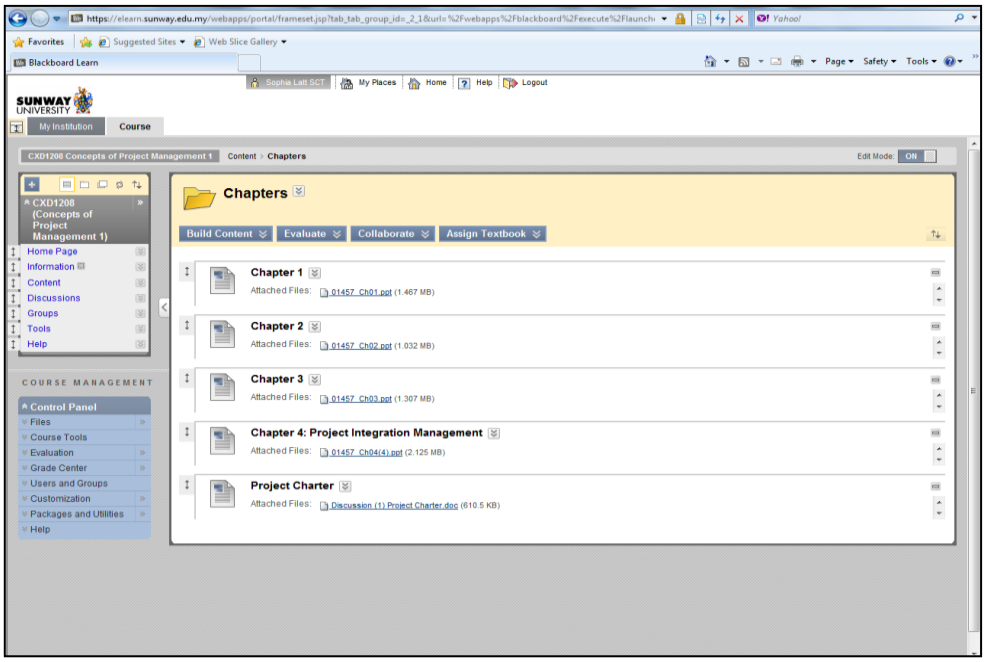


Figure 1.2: Sample screenshot from the content page in Blackboard E-learn (http://elearn.sunway.edu.my)

In addition to Blackboard E-learn, some lecturers are using additional e-learning tools in their teaching. For instance, some lecturers use YouTube to create videos (L. Laxman, personal communication, January 15, 2012), Google Docs to share documents (S.M. Chit, personal communication, January 12, 2012) and Facebook for communication purposes (J. Krishna, personal communication, January 10, 2012). This information will be used to understand the importance of using these e-learning tools in Sunway University and to identify its purposes and strengths in order to fulfil in objectives of this study.

Furthermore, a theoretical framework called "Learner-centred framework for e-learning" proposed by McCombs (2005) is used in this study to assess the level of awareness and perception of University students towards the e-learning tools. This can be achieved by looking into four domains, namely cognitive and meta-cognitive factors, motivational and affective factors, development and social factors as well as individual-difference factors. Each of these domain factors symbolizes a list of 14 learner-centred principles to identify the learner's behaviour towards learning. By looking into these 14 principles, instructors are able to create better course materials and improved teaching and learning environment as these principles guide on what factors we should look into from the learner's perspective. For example, what are their cognitive styles, what motivates them to learn, how they will develop socially and also to find out their differences in terms of learning. This framework will be explained further in chapter 2.

It is very important to evaluate e-learning from a psychological perspective so that the instructors know what type of e-learning tools can be used to create the instructional materials and which tools are suitable to assist them in the teaching and learning processes, and thus enhance students' learning achievement.

1.3 Problem Statement

Previous research has found that adoption of e-learning tools in higher education has not reached to the level that enables teaching and learning to be as effective and interesting as possible .The reason for its ineffectiveness at the moment is because higher education failed to choose the right media or tool for their teaching and learning processes. This is in line with not having enough research on potential of IT technologies and which tools suit the institution best. This in return do not support and reflect new teaching principles and practices well (Dewan, 2010).

Some problems had been identified during the preliminary study with a few lecturers and students in Sunway University. These problems include lack of understanding of requirements, expectations and learning styles, limited knowledge on the preparation of useful course materials based on learner's needs, lack of e-learning tools and lack of learners' participation in the current learning process.

1.3.1 Lack of the Understanding of Learners' Requirements, Expectations and Learning Styles

Sunway University lecturers are bound to look into the perspective of instructors when creating course materials, assessments or even tutorials than looking into the learner's perspective. The way the knowledge is conveyed is not passed to the learners productively. Therefore, the instructors should

understand what are the requirements, expectations and even what kind of learning styles suit the learners. By doing so, the standard of materials and assessment would be just as appropriate for the learner's level and learning ability.

1.3.2 Limited Knowledge on the Preparation of Useful Course Materials based on Learners' Needs

Another problem encountered is instructors tend to rely heavily on PowerPoint slides for so many years and stick to the same style of teaching. During the preliminary study with a few selected lecturers, it was found that all of them are using PowerPoint slides in all their classes without any additional teaching aid-tools. Therefore, this study intends to create better awareness to the instructors on other e-learning tools besides PowerPoint slides. Through an informal interview with several lecturers, most of them relied on the PowerPoint slides provided by the book publisher in the form of instructor resources for their classes. Besides that, instructors should also keep in mind on learner's behaviour towards learning when preparing course materials and assessments.

1.3.3 Lack of E-Learning Tools

The common e-learning tool used in Sunway University is a learning management system called Blackboard E-learn. This tool has been implemented since the beginning of year 2000 and being updated from time to

time. Up to date, there are no e-learning tools introduced by the IT department to academics besides Blackboard E-learn. There are a couple of academicians that proposed e-learning tools in internal workshops and seminars (J. Krishna, personal communication, January 10, 2012) but no implementation has been done so far to this institution. This study will widen the perception of other available e-learning tools which can enhance and improve the teaching and learning processes to a higher level.

1.3.4 Lack of Learners' Participation in the Current Learning Process

During the preliminary study with 10 students, some problems have been identified. Students tend to lose focus within the first half an hour due to unattractive slides and boredom. According to Kwan (S.C. Kwan, personal communication, February 3, 2012), he said most of his lecturers tend to use the same method to show content, which are slides. He wants the instructors to be more creative in creating content and use other updated ways to show materials and ways to lighten the learning process such as using videos, chats and using social networks for discussion.

To address these issues, the McCombs's learner-centred framework for e-learning (2005) which comprises of psychological principles is used to identify the learner's behaviour towards learning and to find out how these principles influence e-learning tools.

1.4 Research Questions

This study aims to assess the level of awareness and perception of University students towards the use of e-learning tools in campus-based classrooms. Besides that, this study also aims to investigate the relationship between the four domain factors in the McCombs's learner-centred framework and the use of selected e-learning tools. In order to achieve these aims, the study attempts to answer the following research questions:

- **Research question 1:** Do demographic variables (e.g. gender, level of study and school of study) influence students' perception towards the use of e-learning tools?
- **Research question 2:** Is there any significant relationship between the four domain factors in the McCombs's learner-centred framework and the use of e-learning tools among University students?

The main research questions 1 and 2 are further divided into several sub-questions as follows:

- **Sub-question 1a**: Is there any significant effects between gender and the perception towards the use of e-learning tools among university students?
- **Sub-question 1b**: Is there any significant effects between the level of study and the perception towards the use of e-learning tools among university students?

- **Sub-question 1c**: Is there any significant effects between the school of study and the perception towards the use of e-learning tools among university students?
- **Sub-question 2a**: Is there any significant relationship between cognitive and meta-cognitive factors and the use of e-learning tools among university students?
- **Sub-question 2b:** Is there any significant relationship between motivational and affective factors and the use of e-learning tools among university students?
- **Sub-question 2c:** Is there any significant relationship between development and social factors and the use of e-learning tools among university students?
- **Sub-question 2d:** Is there any significant relationship between individual-difference factors and the use of e-learning tools among university students?

1.5 Objectives of the Study and Hypotheses

The objectives of this study are as follows:

1. To assess the level of awareness and perception of university students towards the use of e-learning tools based on the demographic variables.

2. To examine how the four factors in the McCombs's learner-centred framework relate to the use of e-learning tools among University students.

Based on the main objectives, this study was expecting that:

- **Hypothesis 1:** There is a significant effect between the demographic variables (e.g. gender, level of study and school of study) and the perception of university students towards the use of e-learning tools.
- **Hypothesis 2:** There is a significant relationship between the four factors in the McCombs's learner-centred framework and the use of e-learning tools among University students.

Hypothesis 1 and Hypothesis 2 were further elaborated and have been broken down into sub-hypotheses as below:

- **Sub-hypothesis 1a:** Students' gender has a significant effect on the perception of university students towards the use of e-learning tools.
- **Sub-hypothesis 1b:** Students' level of study has a significant effect on the perception of university students towards the use of e-learning tools.
- **Sub-hypothesis 1c:** Students' school of study has a significant effect on the perception of university students towards the use of e-learning tools.

- **Sub-hypothesis 2a:** Cognitive and meta-cognitive factors in the McCombs's learner-centred framework have a significant relationship with the use of e-learning tools among university students.
- **Sub-hypothesis 2b:** Motivational and affective factors in the McCombs's learner-centred framework have a significant relationship with the use of e-learning tools among university students.
- **Sub-hypothesis 2c:** Development and social factors in the McCombs's learner-centred framework have a significant relationship with the use of e-learning tools among university students.
- **Sub-hypothesis 2d:** Individual-difference factors in the McCombs's learner-centred framework have a significant relationship with the use of e-learning tools among university students.

1.6 Scope of the Study

This study aims to determine the level of awareness and perception of University students towards the use of e-learning tools. Seven chosen e-learning tools for this study include Blackboard E-learn, Search Engines, Instant Messaging, YouTube, Ms PowerPoint, Facebook and Email. These e-learning tools were chosen because it relates to the real usage of these tools

based on the comments given by several lectures as identified in section 1.2. Furthermore, two out of seven e-learning tools were categorised as top ten e-learning tools based on a review by Centre for Learning and Performance Technologies (2009). Top ten tools identified includes e-learning tools such as Twitter, Delicious, YouTube, Google Reader, Google Docs, Wordpress, Slideshare, Google Search, Audacity and Firefox. Based on this list, only YouTube and Google Search were taken for this study as it suits the practise of using e-learning tools in Sunway University.

Furthermore, the level of awareness and perception of University students towards the use of e-learning tools would be measured by examining the number of years and experiences they use the tool, their purposes of using the e-learning tools and their opinion on the strengths of the tool.

This study is also implemented using a theoretical framework called "Learner-centred framework for e-learning" by McCombs (2005). Four domain factors identified by McCombs (2005) are used as a base for creating questions during the data collection process. These four domain areas to be investigated in conjunction with using e-learning tools in Sunway University are cognitive and meta-cognitive factors, motivational and affective factors, development and social factors and individual-difference factors. Within these domains are the 14 learner-centred principles which are used to find out whether are there any significant relationship between these principles and the use of e-learning tools. The outcome of this study is to determine whether these domain areas are

the right factors in getting the learners improve their learning capabilities in association to e-learning tools.

This study is only limited to Sunway University students only**.** The respondents were limited to Diploma and Undergraduate levels in Sunway University.

1.7 Research Flow Design

Figure 1.3 shows the research flow design for this study. This study started by defining research objectives and ended with conclusions and implications.

First step in completing this study was to define research objectives. Research objectives are goals that are to be achieved. There were two research objectives for this study namely (1) to assess the level of awareness and perception of University students towards the use of e-learning tools and (2). to examine the factors that influences the usage of e-learning tools. Once research objectives have been reviewed and refined, the next step was to define problem statements related to the research objectives. This should be achieved by investigating the current problems in the scope of study and produces research questions and hypotheses to solve the problems.

Once the problems have been identified, next was to create research questions pertaining to the problem statements in order to generate hypotheses to be used as a benchmark for this study. Literatures from other researchers were then gathered and reviewed to get a better understanding of the topic area and to get more ideas on what they were their perceptions on the topic area. By doing so, it enhanced the knowledge of the author and produced a better questionnaire in order to support the research questions and hypotheses. Literatures were collected through electronic databases available in Sunway University's' library web site and other related links.

Next step was to design the study and developed research methods. The author need to plan how many participants needed in this study and where is the location of the participants. Besides that, what type of survey method to be used was also looked into before deciding the most appropriate one for this study. Questionnaires were used due to the large number of participants and large number of data to be collected for this study. Questionnaire were created and reviewed before distributing to the participants. Research methods were also looked into in this stage. Research methods refer to the methods used to gather information about the study which includes research methods such as qualitative or quantitative. This study uses quantitative method to collect data. Sampling method such as random sampling was chosen for this study. Questionnaires collected were keyed-in into the SPSS programme and then analysed by selecting the appropriate analysis function for each research questions. This study uses descriptive analysis such as frequency, median, standard deviation methods and inferential analysis such as One-Way ANOVA

test to test the significance differences between variables and Pearson correlation coefficient to test the significance relationship between variables. Analysed data were then interpreted and conclusions were drawn based on the analysis.

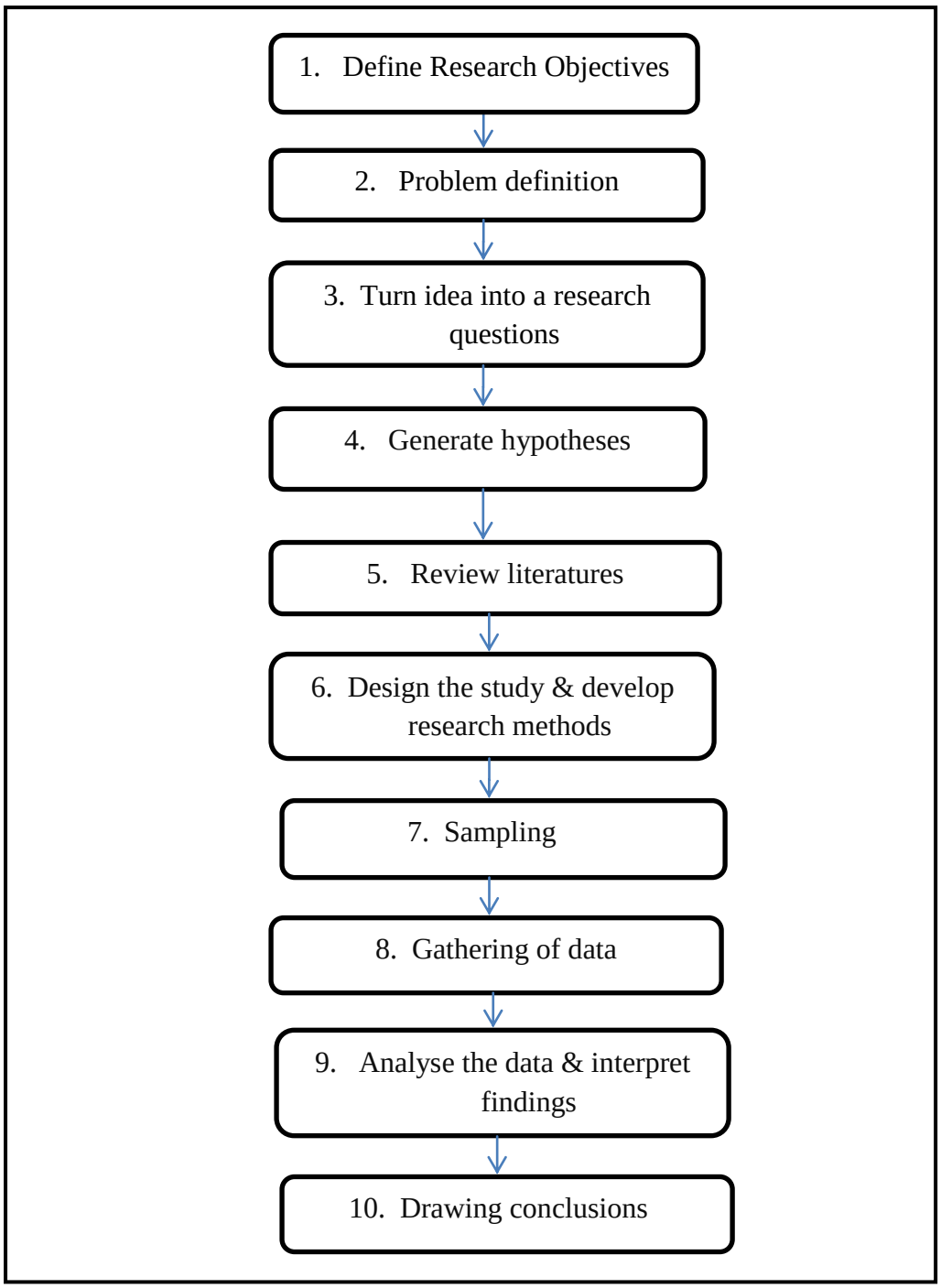


Figure 1.3 Research Flow Design

The last stage was to draw conclusions and implications of the findings and to find out whether the analysed results support the research questions and hypotheses that were created earlier. A very strong and concrete conclusion will determine the understanding of the author towards this topic of study and recommends future work for the good use this study.

1.8 Significance of the Study

This study allows educators, content developers, course developers and management in increasing their awareness in building a more effective learning environment and innovative learning model.

The learner-centred framework for e-learning provides instructors an understanding of the underlying dynamics on the relationship between those four domains as specified earlier (i.e. cognitive and meta-cognitive factors, motivational and affective factors, development and social factors and individual-difference factors) and e-learning tools.

The findings of the study allow the instructors to design courses to fit programme's intended purpose, identify communication requirements and plan for course structure requirements.

Findings also serve to inform educators on the usefulness of implementing e-learning tools in campus in association with the four domains,

namely cognitive and meta-cognitive factors, motivational and affective factors, development and social factors and individual difference factors. The finding will outline the importance of studying the domain factors when developing course content as well as using e-learning tools. This allows the designers and content developers to re-evaluate their programme course structure to support lecturers in delivering course materials in an effective and productive manner.

Furthermore, this study also reveals the level of awareness that University students have on using e-learning tools based on the four domain factors. Demographics variables were also looked at in the study to examine any significant differences between the age, gender, level and experiences of the participants.

1.9 Definitions of Terms

This section defines several terms used in the study as follows:

- **E-learning:** E-learning is the use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance (Rosenberg, 2001).
- **E-learning applications:** E-learning applications and processes include Web-based learning, computer-based learning, virtual education opportunities and digital collaboration. Content is delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM. It can be self-paced or instructor-

led and includes media in the form of text, image, animation, streaming video and audio (Tavangarian, 2004).

- **E-learning tools:** E-learning tools are software that are used to developed content, navigation structure, interface design and multimedia elements such as text, video, audio, animation and graphic. Example of e-learning tool vendors are Blackboard, WebCT, Learn.com, eCollege, Desire2Learn, to name a few (Veeramani, 2010)
- **E-learning computer technologies:** E-learning computer technologies are communication mediums such as Internet, email, discussion forums, collaborative software and team learning systems that are used to enhance the teaching and learning process (Tavangarian, 2004).
- **Learner-centred:** "Learner-centred" is the perspective that couples a focus on individual learners on heir heredity, experiences, perspectives, backgrounds, talents, interests, capacities, and needs with a focus on leaning the best available knowledge about learning and how it occurs and about teaching practices that are most effective in promoting the highest levels of motivation, learning, and achievement for all learners (McCombs, 2000).
- **Learner-centred framework:** It is a framework designed by McCombs (2005) to explain the 14 learner-centred principles which are categorized into four research domains namely: cognitive and meta-cognitive factors, motivational and affective

factors, development and social factors and individual-difference factors (McCombs, 2005).

- **Learner-centred psychological principles:** It is a document created by the American Psychological Association's Board of Educational Affairs in 1995. The 14 revised principles are as follows (McCombs,2005):
  - Principle 1: Nature of the learning process.
  - Principle 2: Goals of the learning process.
  - Principle 3: The construction of knowledge
  - Principle 4: Strategic thinking
  - Principle 5: Thinking about thinking
  - Principle 6: Context of learning.
  - Principle 7: Motivational and emotional influences on learning
  - Principle 8: Intrinsic motivation to learn
  - Principle 9: Effects of motivation on effort.
  - Principle 10: Developmental constraints and opportunities.
  - Principle 11: Social influences on learning
  - Principle 12: Individual differences in learning
  - Principle 13: Learning and diversity
  - Principle 14: Standards and assessment

1.10 Organisation of the Report

This research project comprises of five chapters. The first chapter is the introduction to the study which covers several sections such as background of the study, problem statement, research questions, objectives of the study and hypotheses, research framework, scope of the study, significance of study and definition of terms.

The second chapter is literature review. This chapter presents the review of literature of topics and issues pertaining to the topic of the study. This chapter covers literature of e-learning concepts, reviews of existing e-learning tools, McCombs's learner-centred framework for e-learning and related research. The third chapter is the research methodology. This chapter presents the research methods used in gathering data and analyse the data collected in the study.

The forth chapter talks about discussion of results. This chapter will present the analysis of results from the survey. Results will be discussed and recommendations will be proposed. The fifth chapter is conclusion. This chapter will discuss the final conclusion for the study and any future work recommendations.

1.11 Conclusions

In this chapter a context for the study has been provided to enable the research to be understood. Inherent in this context is the usage of e-learning tools and the four domains that influences the effectiveness of using the tools. Background information on e-learning, e-learning tools and why this study needs to be done in Malaysian context is also established. This chapter also has given an outline of the theoretical framework that needs to be used for the research design.

The author believes that the implementation of the study may provide valuable information to the development of e-learning tools and hopes that the study may contribute to better understanding the nature using the right e-learning tools in the learning process.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter contains a series of literature reviews on the area of e-learning which comprises of definition of e-learning, why look into e-learning, primary e-learning goals and review of e-learning tools. It also discusses the advantages and disadvantages of e-learning in comparison to traditional learning and McCombs's learner-centred framework for e-learning.

2.2 E-Learning

Veeramani (2010) noted that knowledge management has been handled in various ways such as apprenticeships, colleagues chatting, naming a few. E-learning is one of the tools used in knowledge management to share knowledge among learners E-learning is an approach to facilitate and enhance learning through both computer and communication technology. Veramani added, the term e-learning can be represented as online learning, virtual learning, distributed learning, networked or web-based. E-learning can be categorized as a wide range of applications and processes designed to deliver electronically

which includes Web or even CD-ROM or video conferencing using satellite transmission.

The growing interest in e-learning seems to be coming from different directions such as interest in e-learning growing from organizations that sees online learning as their repertoire extension of their distance learning activities. From the corporate point of view, they see e-learning as a point to reduce costs in terms of training. Employees can do in-house training within the corporate environment. Another area that has an interest in e-learning is residential campus-based educational organisations. They see e-learning as a way to improving access to their programs and a way to tap into growing niche markets (Naidu, 2006).

Numbers of teachers using e-learning to support their teaching has grown rapidly. The contemporary or "Net Generation" learners who have been using information and communication technology are also expected to use their experiences in the learning process (Oblinger, 2005).

2.3 Why E-Learning?

Technology has changed the way we live, work, think and learn. Today's learning has to process more information in less time than in the past (Veeramani, 2010). E-learning is not just a technology but a ground for people to socialized and share knowledge and skills. E-learning is not just having a

multimedia-based computer in a single desktop but all a combination of world-wide network of computers that connects instructors and learners globally with the usage of text, graphics, audio and video.

Woodrow (2007: 7) stated that "Positive attitude towards ICTs is widely recognized as a necessary condition for the effective implementation". In order for e-learning to be implemented successfully, lecturers and students need to have a positive mind in using e-learning tools. By doing so, it provokes a better teaching and learning environment in any respective institutions.

Students' motivation is another factor in increasing students' satisfaction in using e-learning tools. Personal motivation is one reason for success or failure in using e-learning in teaching and learning. Anderson and Gronlund (2009: 5) stated that "highly motivated students perform well in most cases whereas non-motivated students tend to drop out". E-learning tools increase students' engagement because it provides flexibility to shift from teacher-centred student which gives them the freedom to learn.

More (2008) stated that hybrid learning methodologies in higher education increases students' satisfaction, whereas majority of students found that website is a helpful resource (90%) and will have an impact on higher education in the future (85%). Results were in-line with similar studies in majority institutions. Results of the study showed that e-learning is an added supplement to face to face approach of teaching and learning and increases the overall learning experience. Furthermore, this study assertion that online

learning provides choices, increases students' satisfaction, has flexibility, wide coverage of resources and increases opportunities for lecturers to use different delivery and assessment methods.

Roger (2003) defines a number of factors that could influence the users' perceptions towards technologies. Factors include relative advantage which relates to the degree to which an innovation is perceived as better than the comparable product it supersedes; compatibility which relates to the degree of consistency with users' past experiences, habits and values and lastly complexity which relates to the degree to which a technology is said to be difficult to use and understand by the users.

Another opinion from Bhattacherjee (2001) which concluded that a users' willingness to use a technology can only be perceived if the users are able to fulfil their needs. The term used by Bhattacherjee is "confirmation" which relates to the degree to which a user has successfully fulfilled his/her needs in using the technology. The level of perceived usefulness is not constant but will only evolve through use. So the word "confirmation" can be benchmarked to indicate the level of expectation a user's perceived form using technology. If the method on how a student uses a technology is appropriate and correct, then the students; perceptions towards using the technology increases through experiences. In vice-verse, poor use of technology will lead to poor experiences and lead to avoidance (Lam, 2009).

Another factor that contributes to students' perception towards technology is experiences (e.g. the number of years they have used the technology). Students who use the technology in their everyday lives tend to accept the technology comfortably. The urge to use technology has grown from past experiences using computer (Keller & Cernerud, 2002).

Technology-based instruction allows better planning/ development process and the delivery/ learning process. The tools (e.g. synchronous, asynchronous, Internet, CD-ROM, social networks, online streaming, pod-cast, interactive multimedia games/ simulations) enhance the instructional capacity of teachers and learning activity of students. Below are some positive implications that arise with the intervention of e-learning tools in education (Cognitive Design Solutions, Inc, 2005).

- Instructors and curriculum developers can share resources more easily and together build learning-object repositories.
- Multimedia and expanded resources from the network can enhance the traditional classroom experience dramatically.
- Online synchronous tools create a new kind of cyber-classroom, connecting distance learners from many locals ("any where") in peer-to-peer engagement.
- Online self-paced tutorials create enriched interactive and exploratory learning experiences that are accessible on-demand ("any time") when a learner is ready.

Other benefits of e-learning include less expensive to produce and maintain, customizing and personalizing to the learner's unique needs increases retention and increase productivity of instructors (Cognitive Design Solutions, Inc, 2005).

Each type of learning method has its advantages and disadvantages. For example, e-learning is beneficial when the learners want flexibility in terms of time and location. This is usually applies to working and distance students. Traditional learning on the other hand allows immediate feedback from instructors and learners as well as cultivates social community compares to e-learning.

Besides, e-learning increases frustration among learners and instructors if the performance of the network is bad or there is a delay of feedback between them. Traditional learning on the other hand provokes more expenses in terms of purchasing of text books, wastage of papers and investment in classroom preparation. Table 2.1 shows the comparison between e-learning and traditional learning.

Table 2.1: Advantages and disadvantages of e-learning compared to traditional learning

Types of learning	Advantages	Disadvantages
E-learning	1. Time and location flexibility 2. Cost-effective for learners 3. Global and unlimited access to shared information 4. Self-paced	1. Lack of immediate feedback in asynchronous e-learning 2. Increased preparation time for instructor 3. Non-comfortable. Anxiety frustration and confusion to some people
Traditional learning	1. Immediate feedback 2. Familiar to both students and instructors 3. Cultivation of a social community 4. Motivating students	1. Instructor-centred 2. Time and location constraints 3. More expensive to deliver

Source: Mohammad, S. (2009). Effectiveness of e-learning system. *Journal from the International Conference on Computer Engineering and Technology (IEEE)*, 390.

Implication for the study: By understanding the nature of benefits and limitations of both methods, it helps to get a better idea on what type of questions that could be asked in the questionnaire. Getting to know the advantages and disadvantages give a better perspective on what areas to cover and how the questions are to be constructed.

E-learning can be categorised into numerous modals such as using technology such as internet, CD-ROM, interactive multimedia, social networks, Online instruction for distance learning, blended instruction which includes face to face and online learning, synchronous, asynchronous, self-study via online, self-study using subject matter experts, web-based tutorials (self-paced online resources), computer-based tutorials as well as video and audio resources.

2.4 Four Primary E-Learning Goals

Figure 2.1 shows how four primary goals of e-learning help instructors to create course materials in a more productive manner. Instructors can use the four goals to create a better course content. These four learning goals are being mapped using the following criteria:

- Process and Goal: “information vs. instruction” (broadcast, transfer, develop and certify)
- Content: “scope and depth” (awareness, understanding, use and mastery)
- Learning Tasks: “simple vs. complex” (degree of required practice and interaction)
- Development Time: “rapid vs. robust” (amount of time/ effort required for product development).

These four primary e-learning goals give an overall guide to instructors on what criteria they need to be considered when looking into different instructional methods. Table 2.2 shows example of tools, learner interaction and implications developed in respective of the goals. These goals could be co-related to the learner-centred framework proposed by McCombs (2005), a grounded theoretical framework in this study.

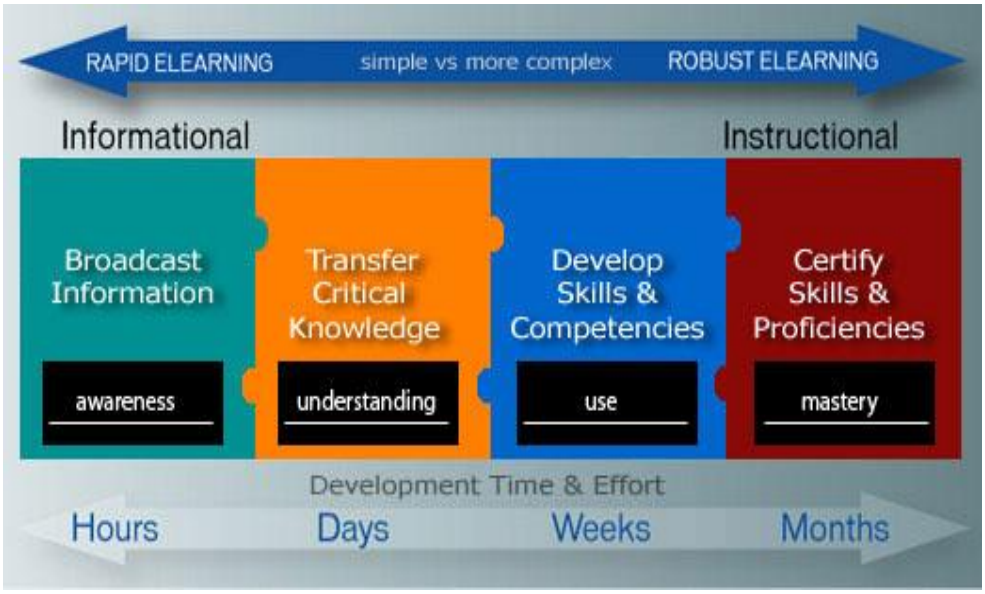


Figure 2.1: Four primary e-learning goals

Source: Cognitive Design Solutions, Inc. (2005). E-learning. Retrieved February 10, 2012, from http://www.cognitivedesignsolutions.com

Table 2.2: Four primary learning goals and its interaction

1. Broadcast Information Goal: demonstrate awareness	Dissemination of facts, figures, data, and notes to an organization to enable individual and team learning & performance
Typical Tools	• Email • PowerPoint, Portal Site: HTML • Online Presentation (live & recorded) • Webcast & Podcast • Flash animation
Learner Interaction	• Navigate • Information-on-demand • Read • Listen • Think With Others (responsively) • Think Independently & Creatively
Typical Tracking	• None

To be continued…

…continued

Table 2.2: Four primary learning goals and its interaction

2. Transfer Critical Knowledge Goal: demonstrate understanding	Deliver key information and knowledge about a business, product, or service to enable individual and team learning & performance
Typical Tools	• Simple WBT courseware • Virtual Classroom (live & recorded) • Blended Learning
Learner Interaction	• Read • Listen • Answer questions • Relate accurate information to appropriate context • Dialogue, Collaboration • Think With Others (responsively) • Think Independently & Creatively
Typical Tracking	• Who took the session? • Will they recall the information?
3. Develop Skills & Competencies Goal: demonstrate use (application of skills, knowledge and attitudes in a meaningful context)	Provide a process of individual and team learning of verbal or motor behaviour, as well as strategies to control and efficiently perform the related behaviour
Typical Tools	• Robust WBT courseware with Assessment • Virtual Classroom (live & recorded) • Blended Learning • Flash interactive simulations
Learner Interaction	• Read • Listen • Answer questions • Practice new skills • Dialogue, Collaboration • Think With Others (responsively) • Think Independently & Creatively
Typical Tracking	• What was learned? • Test & quiz scores? • Does learning transfer to real environment?

To be continued…

…continued

Table 2.2: Four primary learning goals and its interaction

4. Certify Skills & Proficiencies Goal: demonstrate mastery	Require systematic practice of observable and measurable knowledge, behavior, skills, abilities and attributes that enable individual and team learning & performance identified for organizational success.
Typical Tools	• Robust WBT courseware with Assessment • Virtual Classroom (live & recorded) • Blended Learning • Simulations • Performance Support
Learner Interaction	• Read • Listen • Practice skills to mastery criteria • Dialogue, Collaboration • Think With Others (responsively) • Think Independently & Creatively
Typical Tracking	• Who passed certification • When was certification achieved? • When does certification expire?

Source: Cognitive Design Solutions, Inc. (2005). E-learning. Retrieved February 10, 2012, from http://www.cognitivedesignsolutions.com

McCombs (2005) concluded in her framework that any types of learning, traditional right up to e-learning will need to know the four psychological domain factors and their respective principles, namely cognitive and meta-cognitive factors, motivational and affective factors, development and social factors and individual-difference factors.

Implication for the study: By understanding these four primary e-learning goals, the author is able to understand how learners develop their learning capabilities by going through the four development processes which are broadcast information, transfer critical knowledge, develop skills and

competencies as well as certify skills and proficiencies. The review of learning goals also enables the author to understand the type of tools, learner interaction as well as learning outcomes derived from the four primary goals. Getting to know much better about e-learning tools and learner interaction would ease the process of preparing the questionnaires for the study.

2.5 E-Learning Tools

As stated in section 2.3, e-learning is an approach to facilitate and enhance learning process through, computer and communication technology (Salmon & Gill, 2002). This includes personal computers, CD-ROMs, Digital Television, P.D.A.s and Smartphone. Centre for Learning and Performance Technologies (2009) has identified top 10 e-learning tools that instructors can use to disseminate their course materials. These e-learning tools include Twitter, Delicious, YouTube, Google Reader, Google Docs, Wordpress, Slideshare, Google Search, Audacity and Firefox.

The instructors can use these tools to show course materials or other related information to their students. For example, to show video, the instructor can use YouTube to upload the course material, using Slideshare to create interactive slides, using Google search, using Google Docs to allow editing, sharing and uploading course materials and assessments, and so forth.

2.6 The Review of Existing E-Learning Tools

This section looks into some existing e-learning tools which are widely used in corporate and universities around the world. Lots of study and investigation had been done to identify the effectiveness of these tools towards the education. Each tool has its own role and capabilities to give benefit to the education area. The discussion of e-learning tools in this section encompasses forums and assessments, Web 2.0 in Blackboard Learn, JAS (Java Assisted in SMIL), Adobe Presenter and a web educational portal for staff training (available at www.e-teaching.org).

2.6.1 Forums and Assessments

Organero and Kloos (2007) conducted a case study to measure the effectiveness of forums and assessments as a motivational tool in e-learning courses to six public universities in the Madrid area in the centre of Spain. The six participated universities were Universidad Carlos III, Universidad Autonoma, Universidad Politecnica de Madrid, Universidad de Alcala, Universidad Complutense and Universidad Rey Juan Carlos. These universities are involved in e-learning based inter-university initiative that offers e-learning courses. Any student in any participating universities can take the e-learning course. The name of the program is called ADA-Madrid. The program offers 46 subjects in different areas. Each subject can only have maximum 60 students per year. Organero and Kloos choose a particular subject called ‘Internet Security” as a case study with 60 students registered for that subject.

A content management system called Moodle based e-learning platform has been used in the delivery of the subject and been used for evaluation in this study. This platform contains features such as access to content, news, assessment tool, calendar, forums and password access. Organero and Kloos only looked into the effectiveness of the forums and assessments as motivational tools.

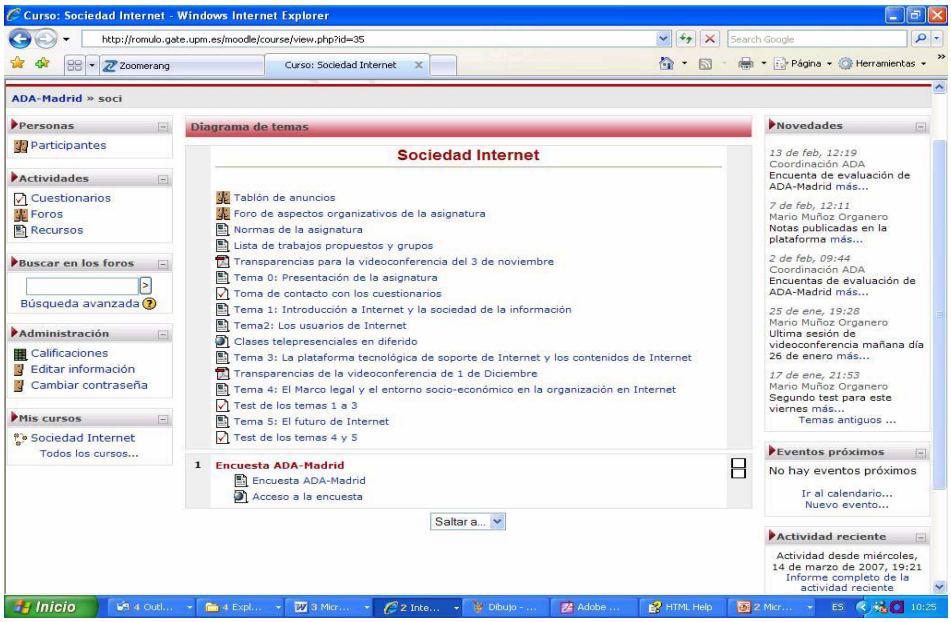


Figure 2.2: Sample screenshot from an LMS used in the practical experience

Source: Organero, M.M., & Kloos, C.D. (2007). Using forums and assessments as motivational tools in e-learning courses: A case study. *Journal from the 37th ASEE/IEEE Frontiers in Education Conference*, 2.

Figure 2.2 shows a sample screenshot from a learning management system conducted in Spanish. The centre of the screen shows the content of the course materials conducted at that point of time. Left panel shows the respective links with e-learning services available in the system such as login, news, calendar, assessment tool, forums, to name a few. Right panel in the

other hand shows the information on announcements the professor posted for the students to do for the next few days.

Organero and Kloos (2007) also analysed three motivational mechanisms of the forum feature which are peer-review of the post, intelligent marking of the contributions and interventions from the professors. The results obtained from these mechanisms are positive and direct effect on the motivation of students. The study also found that the amount of guidance provided by professors has also a direct and positive impact in motivation.

Besides, the effectiveness evaluation of the assessment features was performed among two groups of students:- namely group with self-assessment and group with grade-oriented-assessment. Self-assessment is a method where students evaluate themselves on what they know and what they don't whereas grade-oriented- assessment is an assessment method where the professors mark students' work and assign grades to them. Results obtained from second group were a direct and positive effect on the motivation of students. Organero and Kloos (2007) added the motivational impact of assessments also depends on the type of students. For example, students that are interested in the subject tend to have a higher motivational scale compared to students who are only interested in passing the exam when the exam is approaching.

The findings showed that both forums and assessments could effectively motivate students in the e-learning process. By using the right

approach and mechanisms, teachers will be able to cultivate motivation into the students when using e-learning tools in their teaching and learning processes.

2.6.2 Web 2.0 in Blackboard Learn

There are many types of web-based applications out there and it is not easy to find the most appropriate one for your institution. If an institution wants to incorporate Web 2.0 in Blackboard E- Learn, it must incorporate tools that can comprehend with Web 2.0. Going through a normal search engines like Google or Yahoo doesn't really give you the specific results pertaining to Web 2.0 tools but also other non-related results (Plott, 2010). Plott (2010) recommended the following links to search applications related to Web 2.0. One useful link is www.gozweb20.net which only shows available Web 2.0 applications when you are searching in the search bar. Another good search engine called Gotoweb20 offers results including social networks, creating lesson plans, course authoring tools, student organisation tools, language tutor programs and many more. Besides the two links mentioned above, another useful site is www.widgipedia.com which allows you to search for applications that have widget text to drop right into Blackboard course. For example, "Lesson 10" is a language widget that shows an English word with its Spanish equivalent and this function refreshes every day. WWW.simile-widgets.org is also another useful link to allow teachers to add animations to their Blackboard page.

The new release of Blackboard Learn 9.1 now enables integration with Web 2.0 to host collaboration tools from other platform such as blogs, wikis and discussion boards within the course materials. Furthermore Blackboard Learn 9.1 also includes three high technology functions with the support of Web 2.0. Firstly is mash up tool which includes widgets to enable Bb 9.1 to engage with outside social networking, social bookmarking, open source applications and many more. BB mobile is another application that can integrate with Blackboard Learn 9.1 to allow learners to interact with their classmates, assignments and their instructors at anytime, anywhere. Another remarkable capability of Blackboard Learn 9.1 is its ability to interact with other applications such as YouTube, NBC News Archives, Slideshare, Flickr and many more to come (Plott, 2010).

2.6.3 JAS (Java Assisted SMIL)

Another well known e-learning tool is JAS (Java Assisted SMIL), which is an authoring tool to build multimedia presentations with rich media such as graphics, animation, video and audio. The presentations created are implemented under the JAS framework which is supported by Java GUI (Graphical User Interface) and JMF (Java Media Framework). Then, it will be exported to SMIL (Synchronized Multimedia Integration Language) syntax for the integration of all media together. Figure 2.3 shows a sample screenshot from the output of JAS tool. It comprises of three parts: web resources display, video display and content display. Web resources display shows the link to the

online resources related to the content and runs in the Internet Explorer browser.

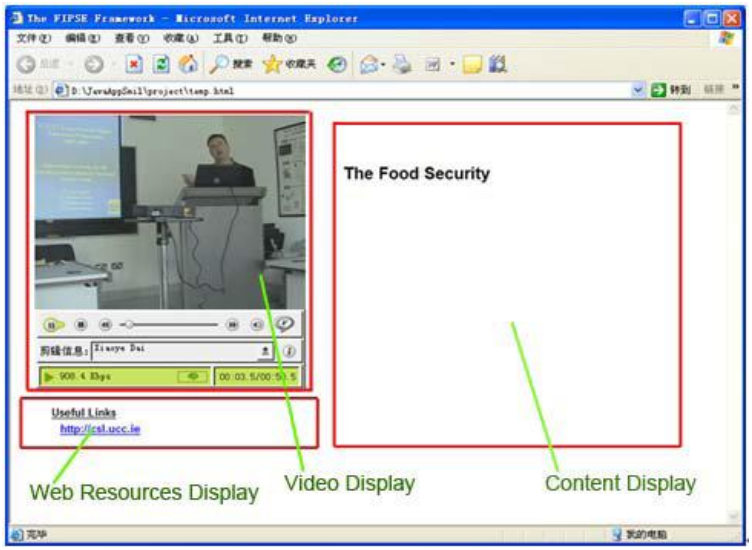


Figure 2.3: Sample screenshot from the output of JAS – Multimedia presentation in SMIL using timeline function

Source: Dai, X., Tabirca, S., & Lenihan, E. (2006). JAS - An e-learning tool for building multimedia presentations. *Journal from the International Multi-Symposiums of Computer and Computational Sciences Conference (IMSCCS)*, 2.

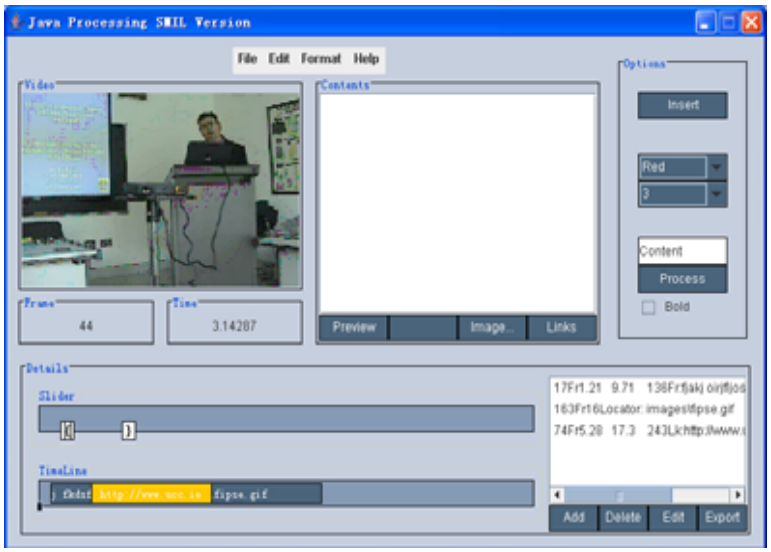


Figure 2.4: JAS interface for presentation content editing

Source: Dai, X., Tabirca, S., & Lenihan, E. (2006). JAS - An e-learning tool for building multimedia presentations. *Journal from the International Multi-Symposiums of Computer and Computational Sciences Conference (IMSCCS)*, 3.

The author can also align his/her presentation video with a timeline function given in the tool as can be seen in Figure 2.3. This enables the presentation author to have the control on how he/she wants the content to be. Once the presentation slides are completed, it is time to export the slides into an image file format within the MS PowerPoint then use JAS to synchronize each slide with streaming video.

Figure 2.4 shows an example of JAS interface use for editing presentation content. Presentation author can edit the time-frame of the video and the content before publishing it real-time. Presentation author can add, delete or even edit the content without knowing SMIL.

JAS tool portrays very good features for educational needs. Some of the major uses of JAS for education are follows:

- Non-verbal communication queries which enable the learners to understand by looking at the presenter's body language via video presentation.
- Simple queries which provides definitions and examples of content to the learners.
- Queries for an additional educational program that consists of a set of related courses which involves availability of online resources to the learners.
- Queries for full basic educational program looks into the high technical education in selected speciality.

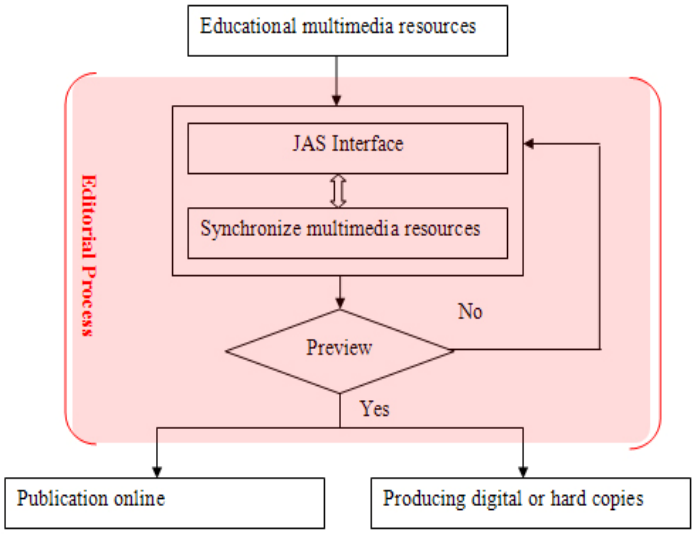


Figure 2.5: Educational processes in JAS system

Source: Dai, X., Tabirca, S., & Lenihan, E. (2006). JAS - An e-learning tool for building multimedia presentations. *Journal from the International Multi-Symposiums of Computer and Computational Sciences Conference (IMSCCS)*, 4.

Figure 2.5 shows an educational process in JAS system. The process starts with combining all the content and the multimedia elements together to form the presentation slides. Once the slides are created, it is then published and exported to JAS system to synchronize the slides using SMIL language. Once exported, the author can preview in web browser to see whether it is perfect. If not, the process will start again. If the presentation is up to the satisfaction of the author, it will be produced as an online publication and digital or hard copies, it's up to the author.

2.6.4 Adobe Presenter in Microsoft PowerPoint

Another useful e-learning tool is Adobe Presenter 7 which caters only for Microsoft PowerPoint application. Before being called Adobe Presenter, it

was termed as Macromedia Breeze, before Adobe bought over Macromedia organisation. Adobe Presenter transforms a boring presentation into a rich media presentation like Flash movies. Another beauty of Adobe Presenter is it allows sharing across web pages, PDF documents and can send to mobile phones that support Flash (mobile phones such as Nokia, Windows Mobile).

Even though Adobe Presenter is available for Microsoft PowerPoint on Windows only, it can also be viewed on browsers with operating systems that support flash players such as on Mac, Linux and Unix (Solaris). Adobe Presenter is build within Microsoft PowerPoint as an authoring window. It can support Office XP, Windows 2003 and PPTX format Windows 2007.

Figure 2.6 shows a sample of presentation slides (Google Webinars) created using Adobe Presenter. Presentation authors can also change theme (see Figure 2.7) and add audio narrations, record Webcam video or import videos. Figure 2.8 shows the layout of a video editor function which allows the presentation author to add effects, adjust the speed of the video, and determines the time frame of the video and many more. Adobe Presenter allows conversion of format from MOV, AVI to 3GB then use On2 FLV encoder to convert to Flash video.

Adobe Presenter also allows editing of audio and adding of narrations into your presentation. Figure 2.9 shows the interface of the audio editor available in Adobe Presenter. Presentation author can add commands during the editing process.

Figure 2.6: Google Webinars

Source: Digital Inspiration (2005). Adobe Presenter 7 for Microsoft PowerPoint-Review. Retrieved February 18, 2012, from: http://www.labnol.org/software/adobe-presenter-for-powerpoint review/4438/

Figure 2.7: Adobe Presenter Theme Editor

Source: Digital Inspiration (2005). Adobe Presenter 7 for Microsoft PowerPoint-Review. Retrieved February 18, 2012, from: http://www.labnol.org/software/adobe-presenter-for-powerpoint review/4438/

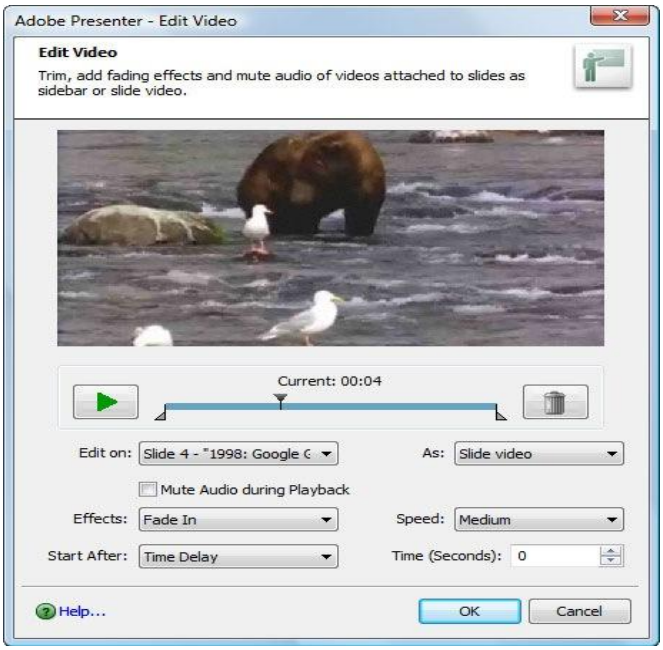


Figure 2.8: PowerPoint Video Editor in Adobe Presenter

Source: Digital Inspiration (2005). Adobe Presenter 7 for Microsoft PowerPoint- Review. Retrieved February 18, 2012, from : http://www.labnol.org/software/adobe-presenter-for-powerpoint review/4438/

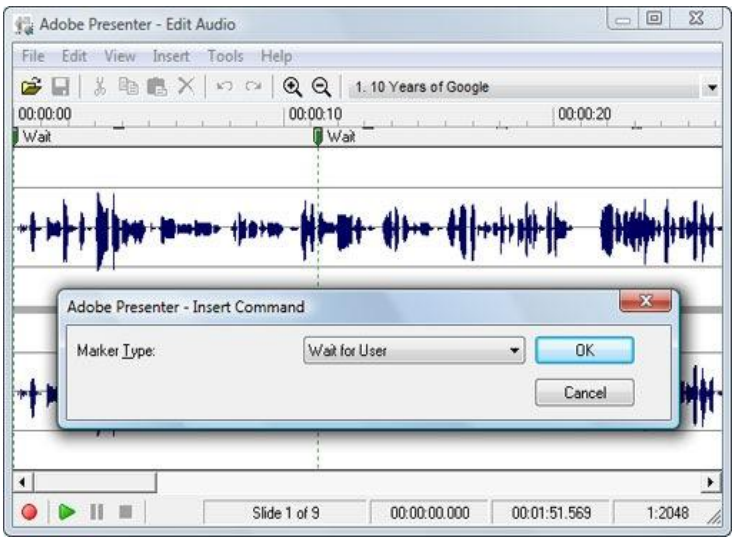


Figure 2.9: PowerPoint Audio Editor in Adobe Presenter

Source: Digital Inspiration (2005). Adobe Presenter 7 for Microsoft PowerPoint- Review. Retrieved February 18, 2012, from: http://www.labnol.org/software/adobe-presenter-for-powerpoint review/4438/

Another remarkable function of Adobe Presenter is slide manager. Slide manager allows the presentation author to customize the slides into multiple presenters. Figure 2.10 shows an example of presentation slides with multiple presenters associated with it. It allows for a better management of slides and better coordination of content.

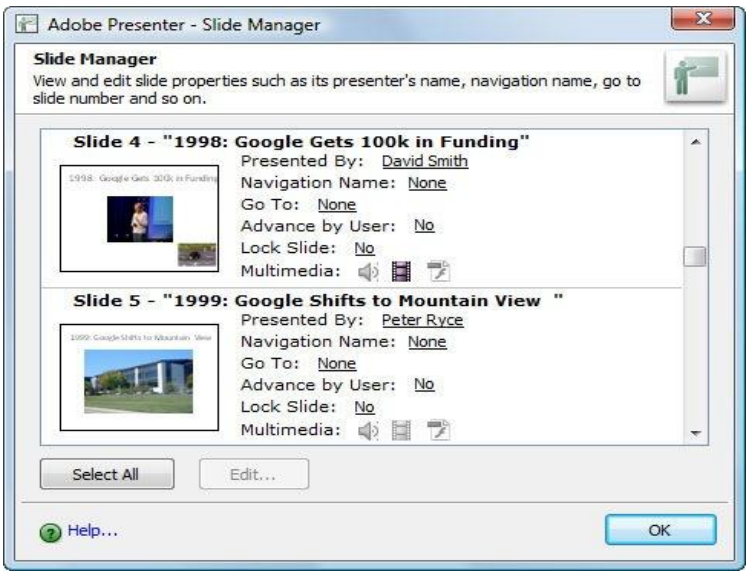


Figure 2.10: Slide manager

Source: Digital Inspiration (2005). Adobe Presenter 7 for Microsoft PowerPoint- Review. Retrieved February 18, 2012, from: http://www.labnol.org/software/adobe-presenter-for-powerpoint review/4438/

2.6.5 Web Education Portal for staff Training

An e-learning portal called Web Education Portal for Staff training which can be accessed at www.eteaching.org has been set up by Bertelsmann Foundation and Heinz Nixdorf Foundation to help teachers to develop themselves in the teaching process. This portal is an editorial system which has been developed using Plone, an Open source Content Management System

(Gaiser, 2004). This portal allows teachers to navigate their individual course materials and enable them to use an advisory services provided by the portal. Teaching staff can use the portal as a consulting and learning ground for them to develop their teaching capabilities by using the advisory services conducted by Professors. One of the key features of this portal is adding location to the specific information. Users can select their individual institution to locate specific content of their institution.

Furthermore, this portal help teachers to access to all new media in teaching, give examples and tips in teaching, give real live "teaching scenarios" and how teaching staff on how to conduct classes using multimedia elements.

Figure 2.11: Sample screenshot from www.e-teaching.org

Source: e-teaching.org (2012). Retrieved February 16, 2012, from: http://www.e-teaching.org

Implication for the study: Some of the e-learning tools such as YouTube, Google Search, Blackboard E-Learn and Microsoft PowerPoint

described in section 2.6 will be reviewed and integrated in the questionnaire to find out on the usage of e-learning tools by Sunway University students. Information such as how frequent the student use the tool, years of experience, purpose of using the tool and the strength of using the tool will be examined and studied to produce a better understanding when generating the questions for the students. By reading more on these e-learning tools, it can help the author to prepare a more constructive questionnaire to achieve the study's objectives.

2.7 McCombs's Learner Centred Framework for E-Learning

This section describes the McCombs's learner-centred framework for e-learning used in this study. This framework was developed by McCombs with the idea adapted from APA (American Psychological Association)'s Learner-Centred Psychological Principles (2005) with a complication of programs, practices, policies, and people that support learning for all.

McCombs and Whisler (1997) defined "learner-centred" as: "A perspective that focuses on individual learners such as their heredity, experiences, perspectives, backgrounds, talents, interests, capabilities, and needs with a focus on leaning which is the best available knowledge about learning and how it occurs and about teaching practices that are most effective in promoting the highest levels of motivation, learning, and achievement for all learners". This dual focus then informs and drives educational decision

making. Learner-centred framework has been adopted from Learner-Centred Psychological Principles.

McCombs and Vakili (2005) theory on learner centred framework for e-learning provides the theoretical foundation for this study. Building on the work from Task Force on Psychology in Education (in association with American Psychological Association (APA), McCombs and Vakili (2005) proposed a framework that comprises 14 principles for designing learner-centred practices at all levels of schooling, including distance learning.

Figure 2.12 shows the framework to be investigated in this study. This framework was chosen among other frameworks because it described a holistic 360 degree view of learning principles from the learners' perspective where else others are more about what instructors think and what approaches they use in the teaching process. This study concerns more about the learners so this framework chosen because it was the most appropriate framework to show the principles involving the learning process of learners. It is an interesting area to investigate which involves learners' characteristics in the learning perspective. A better understanding of how learners think about their current learning processes would be an advantage for the outcome of this study and to investigate whether the framework is the right model to assess learners.

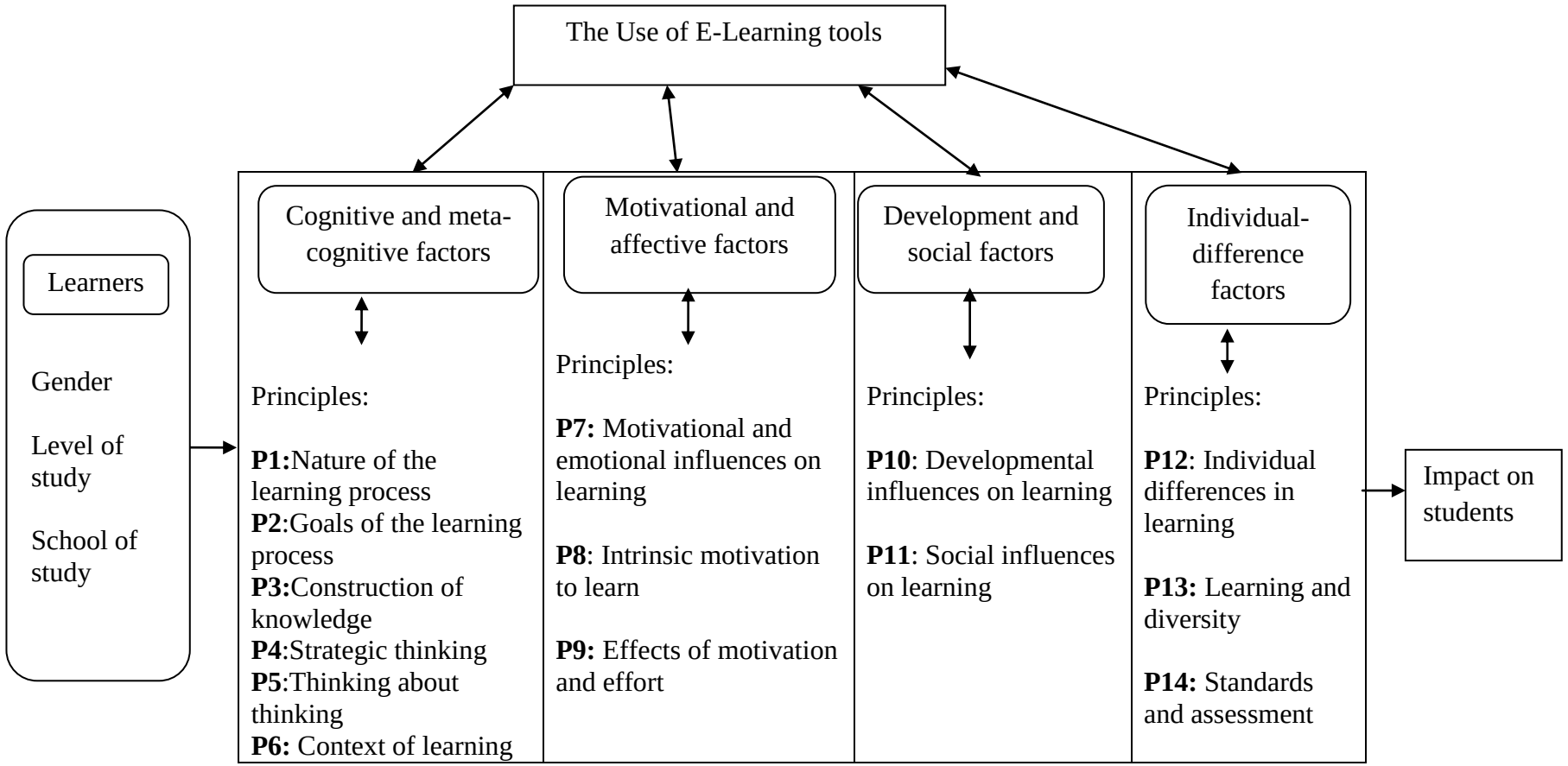


Figure 2.12: A framework to link e-learning tools and impact on students based on McComb's and Vakili's theory on Learner centred psychological principles: Learner-centred framework

This framework explained the 14 principles that are grouped into four research dimensions, namely cognitive and meta-cognitive factors, motivational and affective factors, development and social factors and individual difference factors. These four domains provide a framework for practices that are learner-centred and can be applied in the e-learning environments.

As can be seen in Figure 2.12, learners with various genders, level of study and school of study will be the samples for this study. The learners will be evaluated based on the principles given in the framework and how much awareness they have perceived in using e-learning tools. At the end of the research, the author will discuss whether there is or no significant relationship between the principles and the use of e-learning tools based on the data gathered and analysed. Explanation on each domain factors and principles are available in section 2.7.1.

2.7.1 Cognitive and Meta-Cognitive Factors

First domain in the framework is the cognitive and meta-cognitive factors. It refers to the cognitive control and monitoring of all sorts of cognitive processes like perception, action, memory, reasoning or emoting. It is also plausible that control over such cognitive processes can be either explicit (people are aware of it, i.e. they have "epistemic feelings" or infer things) or implicit (they don't reflect) (edutechwiki, 2007). Six principles (McCombs, 2005) behind this domain are as follows:

- **Principle 1: Nature of the learning process.** Learning complex subject matter is most effective when there is an intentional process to construct the meaning from the information and experience. There are different learning approaches that could be used in schools:- namely from motor skills, generating knowledge from subject matter and learning cognitive skills and strategies.
- **Principle 2: Goals of the learning process.** In order to be a successful learner, he or she must have a goal and support with good instructional guidance to create meaningful representations of knowledge. Teachers should help students to set short and long term goals in the perspective of personal and education.
- **Principle 3: Construction of knowledge.** A successful learner can take new information and construct it together with existing knowledge in a meaningful way. Different student has different ways of organizing information that is unique. Teachers can help students to develop important knowledge and skills. However, unless new knowledge becomes integrated with the learner's prior understandings, the new knowledge remains isolated and difficult to apply to new situations.
- **Principle 4: Strategic thinking.** A successful learner is able to use variety of thinking and strategies to solve complex learning goals. Successful learners use strategic thinking in problem solving, learning and define concepts. They can use a variety of strategies and continue to expand their repertoire by reflecting

on and changing their current strategies, observing others, and benefiting from instruction.

- **Principle 5: Thinking about thinking.** Higher-order strategies for "thinking about thinking and learning" for overseeing and monitoring mental operations-facilitate creative and critical thinking and the development of expertise. Successful learners can reflect on how they learn, set reasonable goals, select appropriate strategies, monitor progress toward goals, and change strategies when necessary. These abilities can be developed through instruction.
- **Principle 6: Context of learning.** L**e**arning is influenced by environmental factors such as culture, technology, and instructional practices. Teachers play major roles which is interactive with both learners and the learning environment. Instruction by the teachers must fit the students' level or prior knowledge, cognitive abilities, and ways of thinking. The nurturing qualities of the classroom environment are particularly influential in student learning.

Implication for the study: Explanation for Principle 1 to Principle 6 under Cognitive and Meta-Cognitive domain factors gives a better understanding on what each principle covers and this helps to develop appropriate set of questions under this domain. By understanding what these principles cover, it also gives a thorough knowing on how cognitive and meta-cognitive play a role in engaging learners in using e-learning tools.

2.7.2 Motivational and Affective Factors

The second domain (McCombs, 2005) refers to the level of motivation and creativity students' perceived in learning. This factor comprises of motivational and emotional influences on learning, intrinsic motivation to learn and the effects of motivation and effort:

- **Principle 7: Motivational and emotional influences on learning.** What and how much is learned is influenced by the learner's motivation. Motivation to learn is influenced by the individual's emotional states, beliefs, interests and goals, and habits of thinking. The depth and breadth of information processed and how much a learner learn a subject matter and remember are influenced by several factors: - namely (a) self-awareness and beliefs about personal control, competence, and ability; (b) clarity and saliency of personal values, interests, and goals; (c) personal expectations for success or failure; (d) affect, emotion, and general states of mind; and (e) the resulting motivation to learn. Cognitions and emotions such as feeling insecure, worrying about failure, being self-conscious or shy, and fearing punishment, ridicule, or stigmatizing labels can have negative influence on the learner's learning ability.
- **Principle 8: Intrinsic motivation to learn.** Creativity, higher order thinking, and natural curiosity contributes to motivation to learners. Intrinsic motivation is triggered by the task, personal interests of the learner and personal choice of control. Students

need opportunities to make choices about learning in line with their personal interests. Students are more likely to be creative and think deeply about projects that are as complex as real-world situations.

- **Principle 9: Effects of motivation and effort.** In order to acquire complex knowledge and skills, learners must put effort and follow guidelines provided by the teachers. Learning complex knowledge and skills requires lots of time and energy.

Implication for the study: Principle 7 to Principle 9 under motivational and affective factors represents how good learning strategies and effort increases the learning process of learners. By understanding better on what each principles under this domain represents allow the author to create questions pertaining to this factor. Questions created in the questionnaire should relate to the principles.

2.7.3 Development and Social Factors

Development and social factors refers to the factors that involve the level of opportunities and constraints students' perceived through their learning process. The development differs through the stages they go through during their learning process. Learning also involves social interaction and communication with others (McCombs, 2005).

- **Principles 10: Developmental influences on learning.** As learners develop, there are different opportunities and

constraints they will face. Learners will go through physical, intellectual, emotional, and social development in their live. Learning will be more effective when learners take into account different physical, intellectual, emotional, and social domains. Students learn best when materials are development appropriately. Overemphasis on one kind of developmental readiness such as reading readiness, for example may interfere with development in other areas.

- **Principle 11: Social influences on learning.** Learning is influenced by social interactions, interpersonal relations, and communication with others. Learning can be developed when students have the opportunity to interact and collaborate with others on instructional tasks. Learning situations that allow for and respect diversity encourage flexible thinking, social competence, and moral development. Learning and self-esteem increases when individuals are in respected and caring relationships with others who see their potential, appreciate their unique talents, and accept them as individuals.

Implication for the study: Principle 10 and Principle 11 under development and social factors relate to the development and social factors the learners will face as their developed. Questions created should involve the characteristics of these principles as well as the environment that the respondents are involved in. Questions should relate to the social environment that the respondents are attached to.

2.7.4 Individual-Difference Factors

Forth domain refers to the principles which states that different students have different learning capabilities (McCombs, 2005). This domain indicates that there are differences in students' learning process in terms of learning strategies, approaches and capabilities. Teachers should ensure that appropriate set of assessments should be created based on students' ability and level.

- **Principle 12: Individual differences in learning.** Learners tend to have different strategies, approaches, and capabilities for learning that develops through experience and inheritance. This involves learning coming from different cultures or other social groups and inheritance such as genes. Through learning and social, learners have acquired preferences for how and at what pace they like to learn. Teachers need to mole learners' learning preferences and modify them if necessary, while respecting individual differences.
- **Principle 13: Learning and diversity.** Learning is most effective when different learners from different cultural background comes together to achieve their learning goals. Learners' linguistic, cultural, and social behaviour are factors that influence the effectiveness of learning. Learning, motivation, and effective instruction that apply to all learners, language, ethnic group, race, beliefs, and socioeconomic status all can influence learning. When learners see their differences in

background and culture are respected, their motivation level tends to increase and learning is thus supported.

- **Principle 14: Standards and assessment.** Setting appropriate high and challenging standards and assessing the learner and the learning process are important parts of successful learning. Assessment provides important information on how the learners perform in schools and how much they know about the subject matter. Assessments are very important to both the learner and the teacher at all stages of the learning process. Ongoing assessment can provide feedback of progress toward goals. Standardized, performance, and self-assessments when used appropriately can guide instructional planning, support motivation, and provide necessary corrections to guide learning.

Implication for the study: Last three principles under this framework: namely individual differences in learning, learning and diversity, standards and assessment discussed about the difference between learners, how culture and background can influence learning and how different standards and assessment play an important role in assessing students. Understanding these three areas enable to create more appropriate questions and linked these principles to the learners' environment. Without know what each principles represent, it would be very difficult to produce questions that support the framework.

2.7.5 Overall implications for this study

Literature review on these four domain factors namely cognitive and meta-cognitive factors, motivational and affective factors, development and social factors and individual difference factors were used to generate a list of questions to be inserted in the questionnaire. Literature on these domain factors were reviewed and studied thoroughly to get a better understanding on what each domain represents. By doing so, a better quality questions could be generated which fits within the objectives of this study and within the boundary of this model.

Each domain factors were broken down into four individual sections. Each domain sections show a list of questions to be asked to the students in a form of Likert Scale. Students were asked to give their opinions whether they agree, or disagree or being neutral in the questionnaire. Questionnaires collected were then collected to be analysed and discussed in chapter 4.

In learner-centred e-learning environments, all users associated with the system are those who have progressively turn from a novice user into an expert as tasks and goals change. Furthermore, all learners are also able to connect to each other in terms of personal or academic. Other implications include learners become more self-directed, good involvement between teachers and learners, learners can see how they are progressing in terms of assessments, feedback on assessment is available anytime and if available for other learners to see, it can help them to remediate and enrich their knowledge and skills.

According to McCombs and Wagner (1995), the learner-centred framework can infuse learner-centred principles and make interferences as to the nature of the learning supports and learning activities. The model is also used as a basis for future research in how effective online education is and also as a guide in infusing learner-centred principles in the online-environment.

Just knowing the principles are not enough. Instructors should support those principles with some practical applications to an e-learning environment. Below are examples of practise implications within the context of those four domain factors. Knowing more in detail about the chosen framework gives a better idea on what type of questions that are needed to be produced for data collection. Why it is so important to know the domains in depth is because the main objective of this study is to find out is there a positive significant relationship between these domains and e-learning tools. If the result shows a positive relationship, it means that these domains are very important to be looked into when designing an e-learning tool from a leaner's perspective.

Table 2.3 shows the breakdown of items based on each principle to be asked in the questionnaire irrespective to the four domains, namely: - cognitive and meta-cognitive factors, motivational and affective factors, development and social factors and individual difference factors. Questions asked reflect to the principles within each domain factors. As can be seen in Table 2.3, items were generated based on the principles and being categorised accordingly. Sample of the questionnaire with these items is available in Appendix B.

Table 2.3: Categorisation of items for each principle

Factors	Principles	Items
Cognitive and meta-cognitive factors	**Principle 1:** Nature of the learning process **Principle 5:** Thinking about thinking	**CM3:** I am able to understand difficult concepts using e-learning through the use of multimedia elements such as video, audio, graphics and animation.
	Principle 2: Goals of the learning process	**CM1:** E-learning helps me access to real-time data, knowledge base, virtual simulations, media clips, web pages and etc.
	Principle 3: The construction of knowledge	**CM5:** My university resources (e.g. Blackboard E-Learn, course and school websites) support my learning. **CM6:** The online learning experiences of my course are well-integrated with face to face learning.
	Principle 4: Strategic thinking	**CM2:** I am able to interact better with my classmates using e-learning tools such as discussion boards, instant messaging, forums, social networks and etc.
	Principle 6: Context of learning	**CM4**: E-learning supports collaboration using computer conferencing, chats, NetGroups, etc.).
Motivational and affective factors	**Principle 7:** Motivational and emotional influences on learning	**MA1:** E-learning makes studying easier for me. **MA2:** E-learning makes studying fun for me. **MA7:** I feel committed to learning by using e-learning. **MA9:** E-learning is an important component of my course.

To be continued…

…continued

Table 2.3: Categorisation of items for each principle

Factors	Principles	Items
Motivational and affective factors	**Principle 8:** Intrinsic motivation to learn	**MA4:** E-learning provides technical support in assessments, email, peer networks, real-time chats, instant messaging, etc. **MA5:** E-learning provides interactivity with my friends and lecturers (e.g. two way communication, personal control and able to make choices using a system).
	Principle 9: Effects of motivation and effort	**MA8:** My online experiences help me engage actively in my learning. **MA3:** It would be good if there is much more e-learning in my courses. **MA6:** I am able to access globally and share information with my friends and lecturers.
Developmental and social factors	**Principle 10:** Developmental constraints and opportunities	**DS1:** I believe that using e-learning helps to increase my computer skills (e.g. searching for information, browsing the World Wide Web, sending emails, uploading video and audio, etc.). **DS2:** I think using e-learning is better than traditional learning.
	Principle 11: Social influences on learning	**DS3:** I am able to develop my communicative and online societal activities with the use of e-learning. **DS4:** I am able to explore academic interests with my lecturers and friends. **DS5:** I am learning to explore ideas confidently with other people.

To be continued…

…continued

Table 2.3: Categorisation of items for each principle

Factors	Principles	Items
Developmental and social factors	**Principle 11:** Social influences on learning	**DS6**: I feel that I belong to the university community. **DS7:** When studying for this course, I often set aside time to discuss course material with my group of friends. **DS8:** When I can't understand the material in this course, I ask my friend for help using e-learning tools (e.g. forums, chats, Facebook, Twitter, Friendster, etc.). **DS9:** Communicating online with my friends and my lecturers help improve my learning. **DS10**: I am able to identify students whom I can ask for help if necessary (e.g. using Facebook, Twitter, forums, etc.).
Individual-difference factors	**Principle 12:** Individual differences in learning	**ID1:** E-learning tools provide multiple ways of displaying materials electronically (e.g. use of text-based material or video to accommodate different type of learners).
	Principle 13: Learning and diversity	**ID4:** I learn better when I have friends from different cultures and social backgrounds.
	Principle 14: Standards and assessment	**ID3:** I am able to retrieve electronic feedback and electronic grades from my lecturers using Blackboard e-learn or respective course website. **ID5:** My lecturers set appropriate assessments according to our level of course and learning ability.

2.8 Related Research

An investigation was conducted by Ware (2006) on the learner-centred practices in online and traditional instruction in higher education. Her findings concluded that there was no significant difference between online and face to face course instructions. She also noted that her findings substantiate the quantitative findings from McComb's work which focused in traditional courses only.

Another research done by Russell (1999) also substantiates Wares' findings which also specified 'no significance difference' to the student achievement in the courses. Data collected done with professors in her focused university also created an equitable learner-centred environment in both online and face to face environments.

Ware's findings concluded that students' satisfaction with the course is measured by the explanation of the instructor of a subject area and the flexibility of the students to explore the subject matter in their own pace. Furthermore, her findings proved that student motivation and self-efficacy level are related very strongly to what they think the benefits of the learner-centred practices are. Last but not least, her findings also mentioned that collaboration and communication activities between instructors and students are very important to be implemented to increase the level of motivation and satisfaction of the student with the course they are enrolled.

Another related research reviewed was on students' perceptions of e-learning tools. Lam (2009) and his research associates conducted a survey to investigate student's use of e-learning strategies and their perceptions on e-learning usefulness. A study was conducted in The Chinese University of Hong Kong and a total of 1438 students responded to the study. Response rate was not high (13.4%) but there was 1438 valid replies which matches with the respondents' profile. Responses were merely females (55.4%) and male (44.6%). Students came from different levels of academic years and faculties, merely Year 1 (31.6%), Year 2 (30%), Year 3 (27.3%), Year 4 and others were 11.1%. Faculties involved in the survey were from Faculty of Arts, Business Administration, Education, Engineering, Law, Medicine, Science and Social Science.

The findings suggested that students, on the whole, accepts and open to innovation. The students were generally positive but not so enthusiastic about various forms of e-learning. Students who were more experienced in using computer generally were more positive about e-learning strategies. Most of the students use computer for social networking and communication. Students appeared to relate e-learning to benefits in a learning process. Conclusion could be made that the more experience students have in using e-learning tools, the higher their perceptions were to e-learning. Students who use e-learning strategies tend to find that these strategies were useful to their learning process.

2.9 Conclusions

In conclusion, e-learning can be said to be an additional contributor to the education industry. As discussed in this chapter, e-learning brings a lot of benefits in comparison to traditional teaching in a classroom. E-learning is an added supplement to the teaching and learning processes. Varieties of e-learning tools are available for the lecturers and students to explore and use in their teaching and learning processes. Lecturers and students should think "out of the box" by using e-learning tools. This will expand their degree of knowledge and skills in the respective field of study.

In addition, this chapter also discusses the framework used in the study. It is very important to understand the framework in order to design a better questionnaire. By doing so, it enables the author to analyse the data and produce a productive results in order to achieve the objectives of the study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methodology used to carry out the research study. It covers the topics such as research design, survey population and sample selection, survey instrument, data collection procedure, data analysis procedure and conclusions.

3.2 Research Design

Research design described plans and procedures for research which cover the decisions from broad assumptions to detailed methods of data collection and analysis (Creswell, 2009). The main objective of this study is to investigate the level of awareness and perception of university students' towards e-learning tools and studies the factors that influence them towards e-learning. It also aims to test the theoretical model developed in the study. There are a number of potential research designs that can be used to collect data. According to Creswell, there are three types of research design which are qualitative, quantitative and mixed methods. In this study, a quantitative approach applying a survey research design in a form of questionnaires has

been selected as the data collection strategy in order to achieve the objectives of the study and to answer the research questions posted in the study.

Questionnaire has been used in this study to gather information about students' opinion on how strongly they agree or disagree with the statements and questions given in the survey questionnaire. By having a large group of representative to answer the questionnaire, judgement can been made of what the students' think the most. Furthermore, questionnaire was used because it was relatively quick and easy to create, code and interpret. Questionnaires are very easy to standardise because every respondent is asked the same question the same way. By doing so, every respondent in the sample answers exactly the same question (D'Astous, 2000). This would allow the researcher to provide a quantitative or numeric description of trends, attitudes, or options of a population by studying a sample of that population (Creswell, 2009).

Figure 3.1 shows the research design framework used in this study. Questionnaire developed based on reviews and past studies was tested for its reliability before distribution. The questionnaire also went through a number of iterations to narrow down the number of scales and ensure clarity of language. At the same time, the survey procedures which consist of data collection and data analysis were planned and designed to ensure a proper questionnaire distribution and selection of appropriate data collection and data analysis method(s). Samples were then selected using random sampling method for this study followed by collection of quantitative data. Data collected will be

analysed using SPSS programme and results will be produced. These results will further be used for discussion and future work of the study.

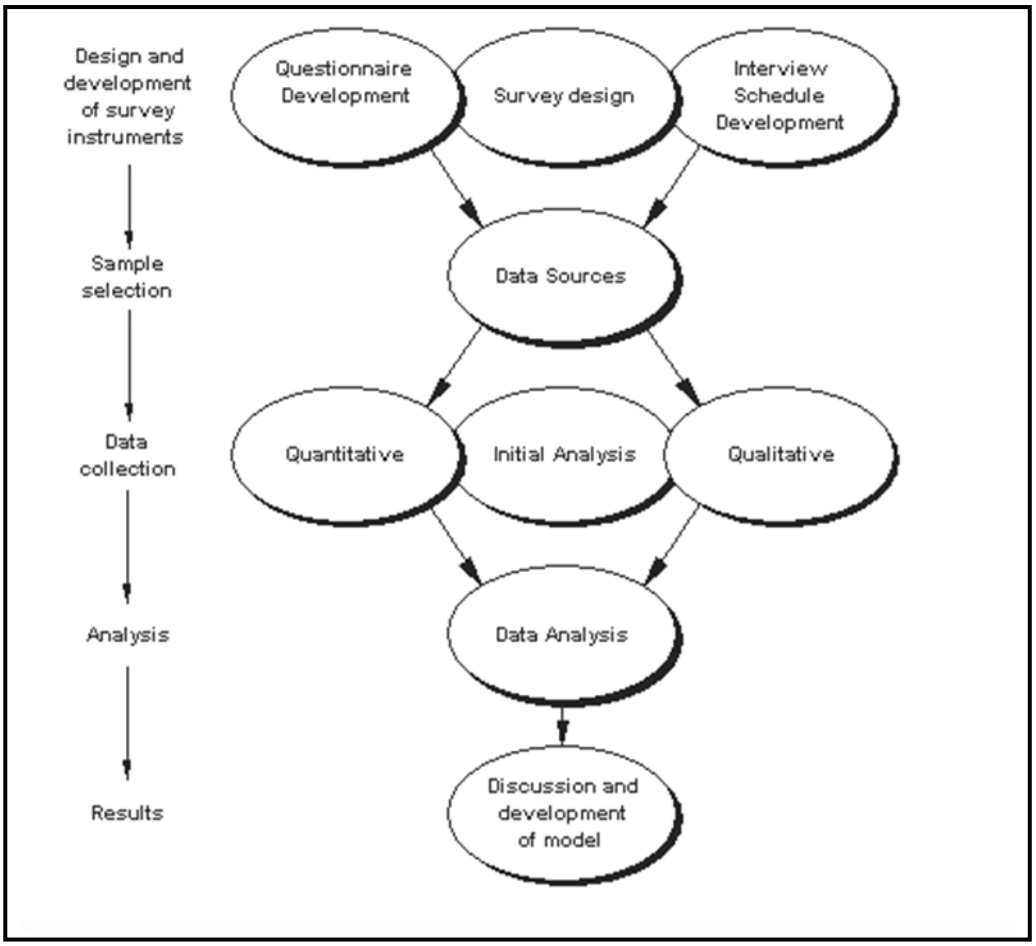


Figure 3.1: Summary of the research design

Source: Siragusa, L. (2002). Research into the effectiveness of online learning in higher education: Survey findings. Retrieved February 3, 2012, from http://www.waier.org.au/forums/2002/siragusa.html

3.3 Survey Population and Sample Selection

The population for this study consists of diploma and undergraduate students from Sunway University. A total of five schools have been chosen for the study, as follows:

- **School of Computer Technology:** School of Computer Technology offers one diploma and three undergraduate programmes. Diploma programme is called Diploma in Information Technology where else the three undergraduate programmes ranges from computer science major, networking major and information system major.
- **School of Business and Law:** School of Business & Law offers programme majoring in business & law, business management and business & finance.
- **School of Creative Arts and Communication:** School of Creative Arts & Communication offers major such as art & design and communication.
- **School of Health and Natural Sciences:** School of Health & Natural Sciences offers programme majoring in psychology and nursing.
- **School of Hospitality, Tourism and Leisure Management:** School of Hospitality, Tourism & Leisure Management offers program in hospitality & management, tourism, culinary as well leisure management.

This study focuses on all the schools and analyses how different the nature of courses responds to e-learning. It intends to find out how students in each school differs in the knowledge of e-learning tools, how much awareness they perceived towards e-learning tools and what are their perceptions towards e-learning tools using the four domain principles framework developed in this

study (i.e. cognitive and meta-cognitive factors, motivational and affective factors, developmental and social factors and individual-difference factors). Total of 201 samples were selected for this study but only 191 were usable. Permission to distribute the questionnaires was granted by the Head of Schools. Sample of Letter of Permission is available in Appendix A.

Classes were randomly selected based on lecturer's availability in each school. Emails were sent out to the chosen lecturers to grant permission to enter their classes before distributing the questionnaires. It took two weeks to distribute the questionnaires in all the schools and another two weeks to enter data into SPSS (Statistical Package for Social Sciences) version 20.0 programme. In total, four weeks were used to distribute and enter data. Questionnaires were immediately taken back once the respondents have filled up the form. Respondents were given 15-20 minutes to fill up the questionnaire.

Random sampling was chosen for this study due to its simplicity and ease of conducting the survey in comparison to other sampling methods such as stratified sampling, cluster sampling, systematic sampling and two-stage sampling using cluster and systematic. Random sampling was chosen because it allows to randomly selecting samples from a group of population. It is easy to conduct and save time (Statistical Consultants Ltd, 2012).

3.4 Survey Instrument

The principle research method employed in this study involves survey technique. The main instrument developed in this study is a survey questionnaire which was designed to obtain as much relevant information as possible in achieving the objectives of the study.

There were four sections in the questionnaire as follows:

- **First section:** Information about students' e-learning frequency of use, experiences of using the selected learning tools and students' opinions on the purposes of using the e-learning tools and the strengths of those tools,
- **Second section:** Students' current course delivery methods and preferred course delivery methods,
- **Third section:** Four domain factors that influence students' use of e-learning tools and their perception towards e-learning (i.e. Cognitive and Meta-Cognitive factors, Motivational and Affective factors, Developmental and Social factors and Individual-Difference factors), and
- **Forth section:** Demographic details.

In the first section, four items were used to gather information from the respondents. Four items include information about how frequent they use the e-learning tool, number of years they have used the e-learning tool, purposes for using the e-learning tool and the strengths for the e-learning tool. Seven tools

were selected for the study (e.g. Blackboard E-Learn, Search Engines, Instant Messaging, YouTube, Facebook, Ms PowerPoint and Email).

In the second section, respondents were asked on their current course delivery method(s), their preferred course delivery methods, limitations of face to face method and limitations of online learning. Respondents need to select the options from the checkbox given for each item.

In the third section, a set of 30 items were used in the questionnaire to measure the factors that influence students' use of e-learning tools and their perceptions toward e-learning. It comprises four dimensions as follows:

- Cognitive and meta-cognitive factors (items 1– 6),
- Motivational & affective factors (items 7 – 15),
- Developmental & social factors (items 16 – 25) and
- Individual-difference factors (items 26 – 30).

Respondents were asked to rate their opinion about each item using 5-point Likert scale (1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

The last section of the questionnaire was used to collect the demographic data which includes gender, level of study, school of study and major of study.

The questionnaire was pilot tested among 15 students to ensure that all the contents were reliable. Reliability testing is a technique of measuring instrument to discover potential problems with the design as early as possible and provide confidence that the questions meet its reliability requirements. Cronbach alpha statistic was used to measure internal consistency with a resulting alpha value of 0.70 (Coakes & Ong, 2011). Table 3.12 shows the analysis results obtained from the reliability test. Results showed that all the factors are above 0.70. Cognitive and Meta-Cognitive factors was resulted at 0.742, Motivation and Affective factors was resulted at 0.878, Development and Social factors was at 0.893 and Individual-Difference factors resulted at 0.707. The results showed that the four domain factors and its individual items were reliable and consistent for this study and could be used for the data collection process.

Table 3.1: Cronbach Alpha testing results for domain factors

Factors	Cronbach's Coefficient Alpha (α)	N of Items	Mean	Std. Dev.
Cognitive and Meta-Cognitive factors	0.742	6	24.63	3.166
Motivation and Social factors	0.878	9	36.82	4.886
Development and Social factors	0.893	10	43.10	5.586
Individual-Difference factors	0.707	5	18.36	2.364

3.5 Data Collection Procedure

Based on the variables in the hypotheses and research questions, self-administered questionnaires was created and designed. Ideas on how to create questionnaire was made easy by going through samples of e-learning questionnaires on the Internet. By going through the samples, a better clarification could be made on how the questionnaire should look like. Once the questionnaire has been revised and checked, it is time to distribute to the respective schools. Questionnaires were distributed in March 2012 within Sunway University campus and it took two weeks to complete the data collection process. Participants were made aware of the objective and voluntary participation of the study. All research participants were assured that their responses would be anonymous to their perception. Sample of questionnaire is available in Appendix B. Table 3.2 shows the process of how the data collection took place in this study.

Table 3.2 Data Collection Procedure

Process	Time-taken to complete
1. Plan and compile ideas on creating questionnaire	1 week
2. Create questionnaire	1 week
3. Revised questionnaire based on the results of pilot study	1 week
4. Seek permission from Schools	2 days
5. Distribute and collect questionnaire	2 weeks

3.6 Data Analysis Procedure

According to Sarantakos (2007), data analysis is the process of transforming raw data into numbers and applying statistical tools, and aims to describe, summarize, compare data as well as discover knowledge. Quantitative research allows the researcher to summarize large bodies of data and interpret the numbers by using statistics. In this study, the data collected was analysed using the Statistical package for the Social Science (SPSS) programme.

The methods of data analysis used were of three broad categories: descriptive statistics, relational statistics and inferential statistics. Methods used under descriptive statistics were mean, standard deviation, frequencies and percentage to interpret the data such as gender, level of study, school of study and major of study. Bivariate analysis under relational statistics was used to study the correlation between two variables. One Way ANOVA was used to test the significance effect for Hypothesis 1 and Pearson product-moment correlation coefficient was used for Hypothesis 2. Section 3.6.1 and 3.6.2 describe in detail the method used to analyse the given hypotheses.

3.6.1 Hypothesis 1

One Way ANOVA test has been chosen to analyse Hypothesis 1 as follows:

> There is a significant effect between the demographic variables (e.g. gender, level of study and school of study) and the perception of University students towards the use of e-learning tools.

One Way ANOVA was chosen to compare the means of more than two groups of independent variables. The basic procedure is to measure the significant effect of the independent variables. One Way ANOVA was chosen compared to other similar method such as Chi-Square because the data has not seriously violated assumptions for ANOVA. Two assumptions must be drawn from namely: - population samples must be normal and scores in each group must have homogeneous variances. Data collected did not seriously violate both assumptions. Population drawn from the samples were normal and the scores were quire equal. If the data has seriously violated the assumptions for One Way ANOVA, the other alternative is to use Chi-Square (Coakes & Ong, 2011).

For this hypothesis, demographic variables such as gender, level of study and school of study were used as independent variables. The other two other variables that were used to analysed together with the demographic variables were ‘Purposes of using the e-learning tool’ and ’Strengths of using the e-learning tool’. Both of these variables will determine the level of

perception and awareness using the demographic variables. Each demographic variable (e.g. gender, level of study and school of study) were divided into sections and each demographic variable was tested with the seven selected e-learning tools for this study namely Blackboard E-Learn, Search Engines, Instant Messaging, YouTube, Facebook, Ms PowerPoint and Email.

3.6.2 Hypothesis 2

Pearson product-moment correlation coefficient has been chosen to test the Hypothesis 2 as shown below:

> There is a significant relationship between the four factors in the McCombs's learner-centred framework with the use of e-learning tools among University students.

Correlation means to look at the relationship between two variables in a linear. Pearson is a parametric test and it can only be used when the variables that are to be tested did not violate the assumptions. Variables to be tested for this hypothesis did not seriously violate the assumptions for Pearson. Data collected were quite normally distributed, there was some linear relationship between two variables and the scores in each group were quite equal (Coakes & Ong, 2011). If the data do violate the assumptions for Pearson, another alternative is to use non-parametric test such as Spearman correlation coefficient.

Spearman correlation coefficient is less powerful than Pearson correlation coefficient but still could be used to measure data measured on scales besides interval or ratio. For this hypothesis, four domain factors such as Cognitive and Meta-Cognitive factors, Motivation and Affective factors, Development and Social factors as well as Individual-Difference factors were used as independent variables and e-learning frequency of use was used as dependent variable. Each domain factors were divided into sections and being tested with the seven selected e-learning tools for this study namely Blackboard E-Learn, Search Engines, Instant Messaging, YouTube, Facebook, Ms PowerPoint and Email.

3.7 Conclusions

This chapter describes the research methods used in conducting the survey for the study. It is very important to identify the research methods first before conducting the survey. This includes identifying which sampling method to use, who are the respondents, where they are and how to approach them. Besides that, identifying the right method to do data collection and data analysis are also very important to be noted in order to achieve the objectives of this study. If the objectives were achieved, it can conclude that the study has achieved its goal. Results in the next chapter will prove whether the objectives have been achieved. This depends a lot on the selection of sample instruments and analysis methods. Looking into past studies and reviews can help increase the knowledge on how to do research and methods on how to analyse data.

CHAPTER 4

FINDINGS

4.1 Introduction

This chapter presents the results of the study by interpreting the findings in light of research hypotheses and research questions set forth at the beginning of the study. The methods of data analysis used were of two broad categories namely descriptive analysis (i.e. using mean, standard deviation, median, frequency and percentage for analyzing data) and inferential analysis. Descriptive and inferential statistics were used to analyze the quantitative data retrieved from respondents.

4.2 Data Analysis and Results

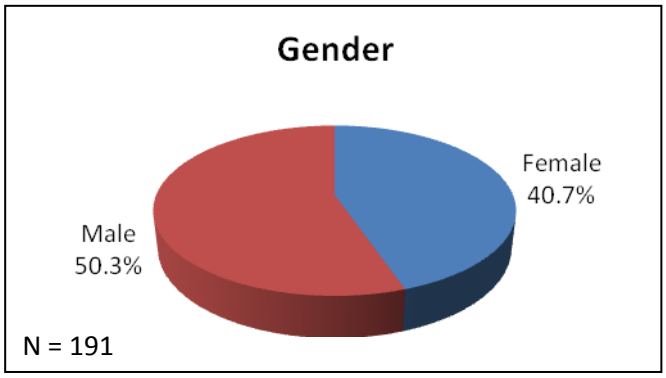
Analysis started with the coding of data and was completed by interpreting the results obtained from using SPSS (Statistical Package for Social Science) statistical package. Before presenting the results which test the hypotheses, summaries of the participants' background data are presented in Figure 4.1.

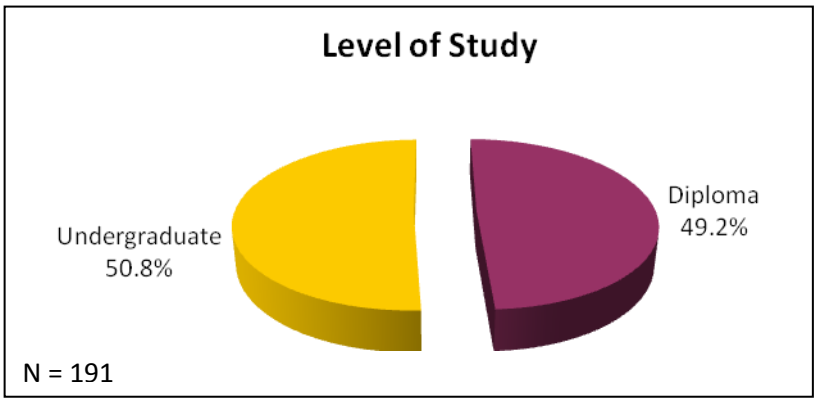
4.2.1 Analysis of Respondents' Background Data

It is important to know about the respondents' background data i.e. gender, the level of study, school of study and major of study which may influence the perception of students towards the use of e-learning tools. The summaries of the respondents' background data are shown in Figure 4.1.

There were 95 (49.7 %) females and 96 (50.3%) males participated in the survey. 94 (49.2%) of them were in diploma and 97 (50.8%) were undergraduate students.

As can be perceived through Figure 4.1, there were 25.1% of the respondents from School of Creative Arts & Communication, followed by School of Hospitality, Tourism & Leisure Management (20.9%), School of Computer Technology and Sunway University Business School (20.4%) respectively and School of Health & Natural Sciences (13.1%). Meanwhile, Figure 4.1 also reveals that 21% of the respondents are specializing in hotel, tourism, events and international hospitality management majors, followed by computer studies majors (i.e. information technology, computer science and information systems) and business studies majors (i.e. accounting & finance, business management, business studies and business administration) with 20.4% responses respectively, psychology (10.5%), art and design (9.4%), performing arts (8.9%), communication (6.8%) and the rest (2.6%) are specializing in nursing.





School of Study	Frequency	Percent	Cumulative Percent
School of Computer Technology	39	20.4	20.4
School of Creative Arts & Communication	48	25.1	45.5
School of Hospitality, Tourism & Leisure Management	40	20.9	66.5
Sunway University Business School	39	20.4	86.9
School of Health & Natural Sciences	25	13.1	100.0
Total	191	100.0	

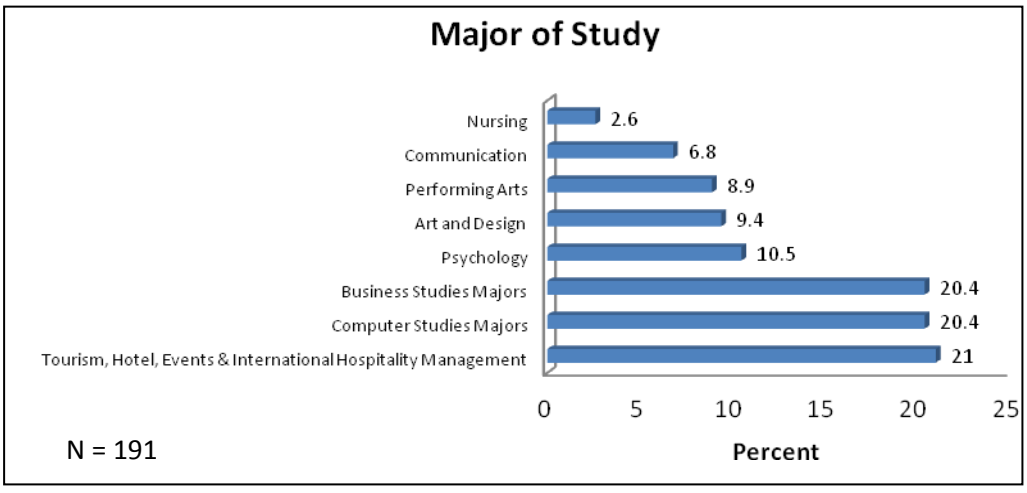


Figure 4.1: Respondents' background data

4.2.2 Analysis of Respondents' course delivery and learning methods

Figure 4.2 shows the current delivery course method(s) of the participated students. 124 (64.9%) students said that their course is using face to face class instruction method, followed by hybrid method with 33.5% and the rest (1.6%) are using online learning.

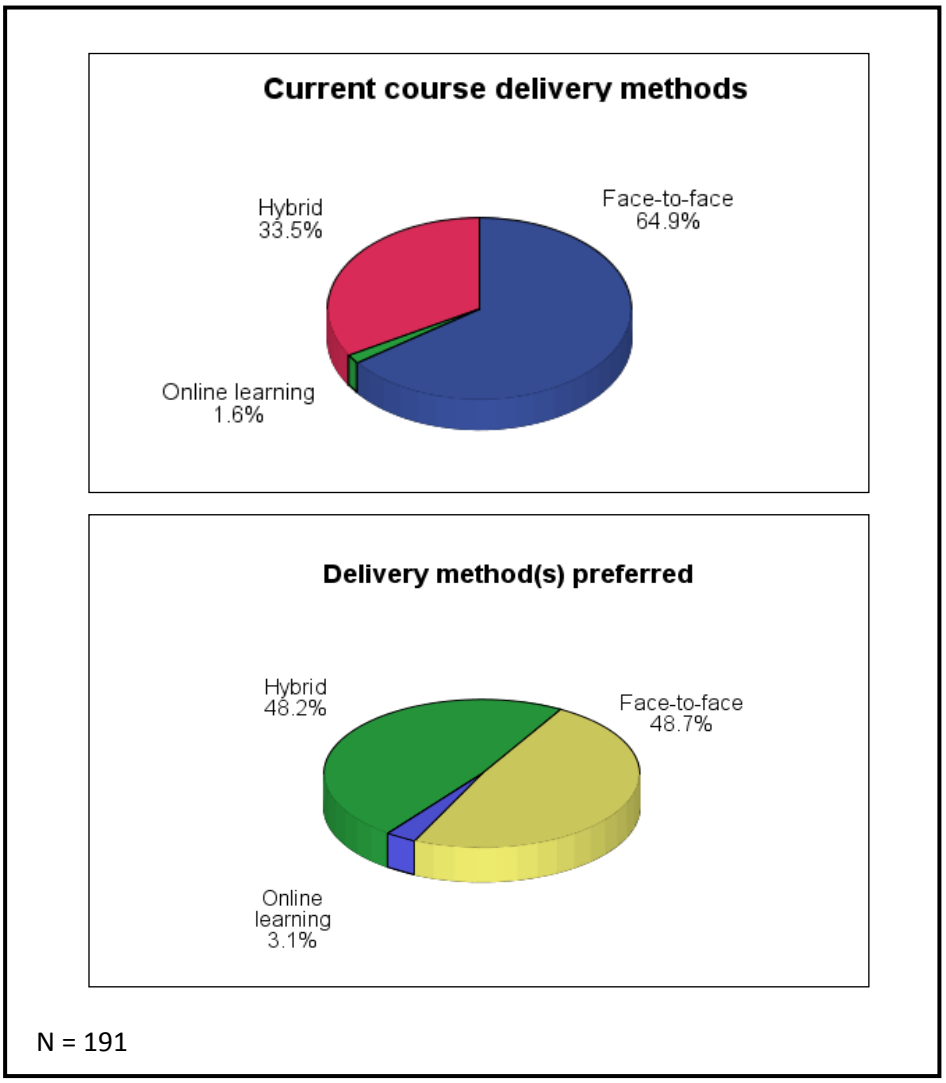


Figure 4.2: Respondents' current and preferred course delivery methods

As can be perceived through Figure 4.2, majority of the students still prefer face to face learning with 48.7 %, followed closely by hybrid learning

with 48.2% and the rest (3.1%) prefer online learning. This indicates that there are some awareness of existence of e-learning tools among Sunway University students.

4.2.3 Hypothesis Testing

Descriptive statistics and advanced techniques were used to test the null hypothesis as follows:

- **$H_0$1:** Students' background data (e.g. gender, level of study and school of study) do not have any significant effects on their perception towards the use of e-learning tools.
- **$H_0$2:** Four factors in the McCombs's learner-centred framework for e-learning (i.e. cognitive and meta-cognitive, motivational and affective, development and social factors, and individual-difference factors) do not have any significant relationships with the use of e-learning tools among university students.

4.2.3.1 Testing H1

This section presents the results on H1 testing that examined whether there was enough evidence to reject $H_0$1. The reject of $H_0$1 explains that students' background data such as gender, level of study and the school of study have significant effects on their perception towards the use of e-learning tools (i.e. Blackboard E-learn, search engines, instant messaging, YouTube, Ms PowerPoint, Facebook and email). In the context of this study, the perception

of students toward the use of e-learning tools were measured based on their opinions on the purposes of using each e-learning tool as well as its strengths. Each e-learning tool included in this study consists of respective purposes and strengths.

The subsequent sections present the results of the H1 testing. The One-Way ANOVA test was used to analyse $H_0$1 which was divided into the following sub- null hypotheses for further analysis:

$H_0$1a: Students' gender does not have any significant effects on their perception towards the use of e-learning tools.

$H_0$1b: Students' level of study does not have any significant effects on their perception towards the use of e-learning tools.

$H_0$1c: Students' school of study does not have any significant effects on their perception towards the use of e-learning tools.

a. The perception of students toward the use of e-learning tools by gender

Blackboard E-Learn

From the following statistics and ANOVA tables as shown in Tables 4.1 to 4.4, the p-values for all the given purposes of using Blackboard E-learn were large namely 'download course materials' ($p = 0.369$), 'upload assignment' ($p = 0.873$), 'participate in discussion board' ($p = 0.872$), 'self enrolment to subjects' ($p = 0.270$), 'check grades' ($p = 0.173$) and 'check

announcements' ($p = 0.325$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$) (see Tables 4.1 and 4.2). Hence, male and female students were in agreement on all the given purposes of using the Blackboard E-learn in the study.

Besides, the results as shown in Tables 4.3 and 4.4 reveal that the p-values for all the given strengths of Blackboard E-learn were rather large i.e. 'one-point access' ($p = 0.283$), 'easy standardization of course materials' ($p = 0.072$) and 'streamlined distribution and updating of lecture notes' ($p = 0.387$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, both male and female students could be in agreement on all the strengths of Blackboard E-learn given in the study.

The overall results show that students' gender does not have significant effects on the perception of students towards the use of Blackboard E-Learn.

Table 4.1: Descriptive statistics for the students' opinions on the purposes of using Blackboard E-Learn and students' gender

Purposes	Gender	N	Mean	Std. Dev.
Download course materials	Male	96	1.25	0.52
	Female	95	1.33	0.64
Upload assignment	Male	96	1.84	0.47
	Female	95	1.83	0.58
Participate in discussion board	Male	96	1.95	0.37
	Female	95	1.96	0.48
Self-enrolment to subjects	Male	96	1.35	0.56
	Female	95	1.45	0.67
Check grades	Male	96	1.54	0.58
	Female	95	1.66	0.65
Check announcements	Male	96	1.38	0.57
	Female	95	1.46	0.67

Table 4.2: ANOVA results for the students' opinions on the purposes of using Blackboard E-Learn and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Download course materials	Between Groups	0.278	1	0.278	0.810	0.369
	Within Groups	64.884	189	0.343		
Upload assignment	Between Groups	0.007	1	0.007	0.026	0.873
	Within Groups	51.962	189	0.275		
Participate in discussion board	Between Groups	0.005	1	0.005	0.026	0.872
	Within Groups	34.571	189	0.183		
Self-enrolment to subjects	Between Groups	0.463	1	0.463	1.224	0.270
	Within Groups	71.495	189	0.378		
Check grades	Between Groups	0.705	1	0.705	1.875	0.173
	Within Groups	71.054	189	0.376		
Check announcements	Between Groups	0.371	1	0.371	0.972	0.325
	Within Groups	72.121	189	0.382		

Table 4.3: Descriptive statistics for the students' opinions on the strengths of Blackboard E-Learn and students' gender

Strengths	Gender	N	Mean	Std. Dev.
One point of access	Male	96	1.67	0.56
	Female	95	1.76	0.61
Easy standardization of course materials	Male	96	1.40	0.57
	Female	95	1.56	0.66
Streamlined distribution and updating of lecture notes	Male	96	1.42	0.57
	Female	95	1.49	0.67

Table 4.4: ANOVA results for the students' opinions on the strengths of Blackboard E-Learn and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
One point of access	Between Groups	0.397	1	0.397	1.160	0.283
	Within Groups	64.765	189	0.343		
Easy standardization of course materials	Between Groups	1.254	1	1.254	3.274	0.072
	Within Groups	72.390	189	0.383		
Streamlined distribution and updating of lecture notes	Between Groups	0.291	1	0.291	0.753	0.387
	Within Groups	73.081	189	0.387		

Search Engines

From the following statistics and ANOVA tables as shown in Tables 4.5 to 4.6, the p-values for all the given purposes of using search engines were

large namely ‘do research’ (p = 0.985) and ‘finding solutions to problems’ (p = 0.361) (see Tables 4.5 and 4.6) indicating that there were not enough evidence to reject the null hypothesis (p > 0.05). Thus, male and female students were in agreement on the purposes of using search engines in doing research and finding solutions to problems.

Meanwhile, the results as shown in Tables 4.7 and 4.8 reveal that the p-values for all the given strengths of search engines were very large namely able to ‘perform keyword research’ (p = 0.612), ‘provide quality information’ (p = 0 .939), ‘wide variety of information’ (p = 0.646), ‘faster way in researching things’ (p = 0.266) and ‘easier way in researching things’ (p = 0.332) indicating that there were not enough evidence to reject the null hypothesis (p > 0.05). Thus, both male and female students could be in agreement on all the strengths of search engines given in the study.

Based on the results as shown in Tables 4.5 to 4.8, it can be concluded that students’ gender had no significant effects on the perception of students toward the use of search engines.

Table 4.5: Descriptive statistics for the students’ opinions on the purposes of using search engines and students’ gender

Purposes	Gender	N	Mean	Std. Dev.
Do research	Male	96	1.06	0.24
	Female	95	1.06	0.25
Finding solutions to problems	Male	96	1.19	0.39
	Female	95	1.24	0.43

Table 4.6: ANOVA results for the students' opinions on the purposes of using search engines and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Do research	Between Groups	0.000	1	0.000	0.000	0.985
	Within Groups	11.246	189	0.060		
Finding solutions to problems	Between Groups	0.142	1	0.142	0.839	0.361
	Within Groups	32.057	189	0.170		

Table 4.7: Descriptive statistics for the students' opinions on the strengths of search engines and students' gender

Strengths	Gender	N	Mean	Std. Dev.
Able to perform keyword research	Male	96	1.32	0.47
	Female	95	1.36	0.48
Provide quality information	Male	96	1.47	0.50
	Female	95	1.46	0.50
Wide variety of information	Male	96	1.26	0.44
	Female	95	1.23	0.42
Faster way in researching things	Male	96	1.29	0.46
	Female	95	1.22	0.42
Easier way in researching things	Male	96	1.27	0.45
	Female	95	1.21	0.41

Table 4.8: ANOVA results for the students' opinions on the strengths of search engines and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Able to perform keyword research	Between Groups	0.058	1	0.058	0.258	0.612
	Within Groups	42.821	189	0.227		
Provide quality information	Between Groups	0.001	1	0.001	0.006	0.939
	Within Groups	47.527	189	0.251		
Wide variety of information	Between Groups	0.040	1	0.040	0.0212	0.646
	Within Groups	35.395	189	0.187		
Faster way in researching things	Between Groups	0.238	1	0.238	1.243	0.266
	Within Groups	36.191	189	0.191		
Easier way in researching things	Between Groups	0.174	1	0.174	0.945	0.332
	Within Groups	34.748	189	0.184		

Instant Messaging

From the following statistics and ANOVA tables as shown in Tables 4.9 to 4.12, the p-values for all the given purposes of using instant messaging were large namely ‘chat with lecturers and friends’ ($p = 0.291$), ‘upload files’ ($p = 0.721$), ‘send files’ ($p = 0.430$), ‘discuss assignments’ ($p = 0.499$) and ‘participate in chat rooms’ ($p = 0.940$) (see Tables 4.9 and 4.10) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, male and female students were in agreement on all the given purposes of using instant messaging.

In addition, the results as shown in Tables 4.11 and 4.12 reveal that the p-values for all the given strengths of instant messaging were large i.e. ‘simple and fast’ ($p = 0.716$), ‘cheap’ ($p = 0.133$), ‘feasible communication’ ($p = 0.111$) and ‘good platform for socializing’ ($p = 0.523$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, both male and female students could be in agreement on all the strengths of instant messaging given in the study.

The overall results show that students’ gender does not have any significant effects on the perception of students towards the use of instant messaging. Both male and female students in Sunway University agreed that instant messaging an e-learning tool which is simple and fast, cheap, feasible in communication, and a good platform for socializing. They also agreed that

instant messaging is a useful tool for chatting with lecturers and friends, uploading and sending files, discussing assignments and so forth.

Table 4.9: Descriptive statistics for the students' opinions on the purposes of using instant messaging and students' gender

Purposes	Gender	N	Mean	Std. Dev.
Chat with lecturers and friends	Male	96	1.29	0.50
	Female	95	1.22	0.42
Upload files	Male	96	1.55	0.54
	Female	95	1.58	0.50
Send files	Male	96	1.43	0.54
	Female	95	1.37	0.49
Discuss assignments	Male	96	1.36	0.53
	Female	95	1.32	0.47
Participate in chat rooms	Male	96	1.54	0.54
	Female	95	1.55	0.50

Table 4.10: ANOVA results for the students' opinions on the purposes of using instant messaging and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Chat with lecturers and friends	Between Groups	0.238	1	0.238	1.120	0.291
	Within Groups	40.191	189	0.213		
Upload files	Between Groups	0.034	1	0.034	0.128	0.721
	Within Groups	50.897	189	0.269		
Send files	Between Groups	0.164	1	0.164	0.626	0.430
	Within Groups	49.595	189	0.262		
Discuss assignments	Between Groups	0.114	1	0.114	0.459	0.499
	Within Groups	46.766	189	0.247		
Participate in chat rooms	Between Groups	0.002	1	0.002	0.006	0.940
	Within Groups	51.370	189	0.272		

Table 4.11: Descriptive statistics for the students' opinions on the strengths of instant messaging and students' gender

Strengths	Gender	N	Mean	Std. Dev.
Simple and fast	Male	96	1.21	0.46
	Female	95	1.23	0.42
Cheap	Male	96	1.45	0.54
	Female	95	1.34	0.48
Feasible communication	Male	96	1.57	0.54
	Female	95	1.45	0.50
Good platform for socializing	Male	96	1.45	0.54
	Female	95	1.40	0.49

Table 4.12: ANOVA results for the students' opinions on the strengths of instant messaging and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Simple and fast	Between Groups	0.026	1	0.026	0.133	0.716
	Within Groups	36.739	189	0.194		
Cheap	Between Groups	0.589	1	0.589	2.274	0.133
	Within Groups	48.961	189	0.259		
Feasible communication	Between Groups	0.691	1	0.691	2.559	0.111
	Within Groups	51.026	189	0.270		
Good platform for socializing	Between Groups	0.110	1	0.110	0.410	0.523
	Within Groups	50.540	189	0.267		

YouTube

From the following statistics and ANOVA tables as shown in Tables 4.13 to and 4.16, the p-values for four of the given purposes of using YouTube were large namely 'download video clips' ($p = 0.270$), 'video clips sharing' ($p = 0.715$), 'edit video clips' ($p = 0.838$) (see Tables 4.13 and 4.14) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Hence, both male and female students agreed that YouTube is an e-learning tool that can be used for downloading, sharing, and editing video clips.

However, the p-value for the purpose of 'post video clips' was 0.018 indicating two different interpretations (see Tables 4.13 and 4.14). If the significance level is set at 0.05, the null hypothesis would have been rejected as $p < 0.05$. However, when tested at a 0.01 significance level, the null hypothesis could not be rejected ($p > 0.01$). Hence, there was no significant difference between male students' and female students' opinion on posting video clips at a 0.01 significance level.

Besides, the results as shown in Tables 4.15 and 4.16 reveal that the p-values for all the given strengths of YouTube were large i.e. 'simple to use the website' ($p = 0.511$), 'availability of updated video clips' ($p = 0.168$), 'watch video with a click of a button' ($p = 0.830$), 'ability to broadcast to millions of viewers' ($p = 0.613$) and 'users are able to control video clips' ($p = 0.667$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, both male and female students could be in agreement on all the strengths of YouTube given in the study.

Based on the results as shown in Tables 4.13 to 4.16, it can be concluded that students' gender had no significant effects on the perception of students towards the use of YouTube a 0.01 significance level.

Table 4.13: Descriptive statistics for the students' opinions on the purposes of using YouTube and students' gender

Purposes	Gender	N	Mean	Std. Dev.
Post video clips	Male	96	1.70	0.46
	Female	95	1.84	0.37
Download video clips	Male	96	1.32	0.47
	Female	95	1.40	0.49
Video clips sharing	Male	96	1.52	0.50
	Female	95	1.55	0.50
Edit video clips	Male	96	1.89	0.32
	Female	95	1.89	0.31

Table 4.14: ANOVA results for the students' opinions on the purposes of using YouTube and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Post video clips	Between Groups	0.993	1	0.993	5.708	0.018*
	Within Groups	32.871	189	0.174		
Download video clips	Between Groups	0.284	1	0.284	1.225	0.270
	Within Groups	43.790	189	0.232		
Video clips sharing	Between Groups	0.034	1	0.034	0.134	0.715
	Within Groups	47.495	189	0.251		
Edit video clips	Between Groups	0.004	1	0.004	0.042	0.838
	Within Groups	18.687	189	0.099		

* $p < 0.05$

Table 4.15: Descriptive statistics for the students' opinions on the strengths of YouTube and students' gender

Strengths	Gender	N	Mean	Std. Dev.
Simple to use the website	Male	96	1.32	0.47
	Female	95	1.37	0.48
Availability of updated video clips	Male	96	1.51	0.50
	Female	95	1.41	0.49
Watch video with a click of a button	Male	96	1.20	0.40
	Female	95	1.21	0.41
Ability to broadcast to millions of viewers	Male	96	1.50	0.50
	Female	95	1.46	0.50
Users are able to control video clips	Male	96	1.70	0.46
	Female	95	1.73	0.45

Table 4.16: ANOVA results for the students' opinions on the strengths of YouTube and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Simple to use the website	Between Groups	0.099	1	0.099	0.434	0.511
	Within Groups	43.095	189	0.228		
Availability of updated video clips	Between Groups	0.476	1	0.476	1.917	0.168
	Within Groups	46.979	189	0.249		
Watch video with a click of a button	Between Groups	0.008	1	0.008	0.046	0.830
	Within Groups	31.029	189	0.164		
Ability to broadcast to millions of viewers	Between Groups	0.065	1	0.065	0.257	0.613
	Within Groups	47.621	189	0.252		
Users are able to control video clips	Between Groups	0.039	1	0.039	0.186	0.667
	Within Groups	39.124	189	0.207		

Ms PowerPoint

From the following statistics and ANOVA tables as shown in Tables 4.17 to 4.20, the p-values for all the given purposes of using Ms PowerPoint were large namely ‘create slides’ (p = 0.784), ‘edit slides’ (p = 0.446), ‘publish slides in web browser’ (p = 0.390) and ‘view slides’ (p = 0.456) (see Tables 4.17 and 4.18) indicating that there were not enough evidence to reject the null hypothesis (p > 0.05). Thus, male and female students were in agreement on all the given purposes of using Ms PowerPoint.

Besides, the results as shown in Tables 4.19 and 4.20 reveal that the p-values for all the given strengths of Ms PowerPoint were large i.e. ‘increase motivation’ (p = 0.608), ‘benefits over basic presentations’ (p = 0.397), ‘aid retention’ (p = 0.642) and ‘better design compared to Overhead Projection (OHP) slides’ (p = 0.478) indicating that there were not enough evidence to reject the null hypothesis (p > 0.05). Thus, both male and female students could be in agreement on all the strengths of Ms PowerPoint given in the study.

The overall results show that students’ gender had no significant effects on the perception of students towards the use of Ms PowerPoint.

Table 4.17: Descriptive statistics for the students' opinions on the purposes of using Ms PowerPoint and students' gender

Purposes	Gender	N	Mean	Std. Dev.
Create slides	Male	96	1.21	0.46
	Female	95	1.19	0.49
Edit slides	Male	96	1.36	0.53
	Female	95	1.31	0.55
Publish slides in web browser	Male	96	1.75	0.48
	Female	95	1.81	0.49
View slides	Male	96	1.24	0.48
	Female	95	1.29	0.54

Table 4.18: ANOVA results for the students' opinions on the purposes of using Ms PowerPoint and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Create slides	Between Groups	0.017	1	0.017	0.076	0.784
	Within Groups	42.423	189	0.224		
Edit slides	Between Groups	0.168	1	0.168	0.584	0.446
	Within Groups	54.387	189	0.288		
Publish slides in web browser	Between Groups	0.175	1	0.175	0.741	0.390
	Within Groups	44.589	189	0.236		
View slides	Between Groups	0.145	1	0.145	0.558	0.456
	Within Groups	49.237	189	0.261		

Table 4.19: Descriptive statistics for the students' opinions on the strengths of Ms PowerPoint and students' gender

Strengths	Gender	N	Mean	Std. Dev.
Increase motivation	Male	96	1.69	0.51
	Female	95	1.73	0.53
Benefits over basic presentations	Male	96	1.13	0.39
	Female	95	1.18	0.48
Aid retention	Male	96	1.56	0.54
	Female	95	1.60	0.57
Better design compared to OHP slides	Male	96	1.51	0.54
	Female	95	1.45	0.58

Table 4.20: ANOVA results for the students' opinions on the strengths of Ms PowerPoint and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Increase motivation	Between Groups	0.072	1	0.072	0.264	0.608
	Within Groups	51.509	189	0.273		
Benefits over basic presentations	Between Groups	0.139	1	0.139	0.720	0.397
	Within Groups	36.458	189	0.193		
Aid retention	Between Groups	0.067	1	0.067	0.217	0.642
	Within Groups	58.425	189	0.309		
Better design compared to OHP slides	Between Groups	0.159	1	0.159	0.506	0.478
	Within Groups	59.526	189	0.315		

Facebook

From the following statistics and ANOVA tables as shown in Tables 4.21 to 4.24, the p-values for two of the given purposes of using Facebook were rather large namely 'create group' ($p = 0.518$) and 'create ads (advertising purposes)' ($p = 0.323$) (see Tables 4.5 and 4.6) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Hence, there was no significant difference between the male and female students and their opinions on the purposes of creating group and ads.

However, the p-values for the purposes of 'upload documents/photos/ videos', 'post comments' and 'chat with lecturers and classmates' were 0.014, 0.041, and 0.015 respectively indicating two different interpretations (see Tables 4.21 and 4.22). If the significance level is set at 0.05, the null hypotheses would have been rejected as $p < 0.05$. However, when tested at a 0.01 significance level, the null hypotheses could not be rejected ($p > 0.01$).

Hence, there were no significant differences between male students' and female students' opinion on these purposes of using Facebook at a 0.01 significance level.

Meanwhile, the results as shown in Tables 4.23 and 4.24 reveal that the p-values for four of the given strengths of Facebook were large namely 'global exposure' ($p = 0.789$), 'free advertising' ($p = 0.287$), 'more personal connection' ($p = 0.210$) and 'making friends with similar interests' ($p = 0.271$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, both male and female students could be in agreement on these strengths of Facebook given in the study. However, the p-values for the strengths of 'connected to people' and 'update news' were 0.006 and 0.018 respectively indicating two different interpretations (see Tables 4.23 and 4.24). If the significance level is set at 0.05, the null hypotheses would have been rejected as $p < 0.05$. However, when tested at a 0.01 significance level, the null hypotheses could not be rejected ($p > 0.01$).

Besides, the p-value for the strengths of 'connected to people' was 0.006 indicating that there was enough evidence to reject the null hypothesis ($p < 0.01$, see Tables 4.23 and 4.24). Hence, there was significant difference among means. The male and female students had different perception towards the strength of 'connected to people'. However, the p-value for the strength of 'update news' was 0.018 respectively indicating two different interpretations (see Tables 4.23 and 4.24). If the significance level is set at 0.05, the null

hypothesis would have been rejected as $p < 0.05$. However, when tested at a 0.01 significance level, the null hypothesis could not be rejected ($p > 0.01$).

Based on the results as shown in Tables 4.21 to 4.24, it can be concluded that the null hypothesis would have be partially rejected. The results show that the male and female students were in agreement on all the purposes and strengths of Facebook given in the study except the opinion on the strength of 'connected to people'.

Table 4.21: Descriptive statistics for the students' opinions on the purposes of using Facebook and students' gender

Purposes	Gender	N	Mean	Std. Dev.
Upload documents/photos/videos	Male	96	1.18	0.44
	Female	95	1.05	0.22
Post comments	Male	96	1.11	0.35
	Female	95	1.03	0.18
Chat with lecturers and classmates	Male	96	1.23	0.45
	Female	95	1.09	0.29
Create group	Male	96	1.47	0.52
	Female	95	1.42	0.50
Create ads (advertising purposes)	Male	96	1.76	0.45
	Female	95	1.69	0.46

Table 4.22: ANOVA results for the students' opinions on the purposes of using Facebook and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Upload documents/photos/ videos	Between Groups	0.740	1	0.740	6.150	0.014*
	Within Groups	22.726	189	0.120		
Post comments	Between Groups	0.329	1	0.329	4.246	0.041*
	Within Groups	14.645	189	0.077		
Chat with lecturers and classmates	Between Groups	0.863	1	0.863	6.017	0.015*
	Within Groups	27.106	189	0.143		
Create group	Between Groups	0.109	1	0.109	0.418	0.518
	Within Groups	49.064	189	0.260		
Create ads (advertising purposes)	Between Groups	0.206	1	0.206	0.982	0.323
	Within Groups	39.637	189	0.210		

* $p < 0.05$

Table 4.23: Descriptive statistics for the students' opinions on the strengths of Facebook and students' gender

Strengths	Gender	N	Mean	Std. Dev.
Connected to people	Male	96	1.09	0.33
	Female	95	1.00	0.00
Updated news	Male	96	1.24	0.45
	Female	95	1.11	0.31
Global exposure	Male	96	1.29	0.48
	Female	95	1.27	0.45
Free advertising	Male	96	1.51	0.52
	Female	95	1.43	0.50
More personal connection	Male	96	1.29	0.48
	Female	95	1.21	0.41
Making friends with similar interests	Male	96	1.43	0.52
	Female	95	1.35	0.48

Table 4.24: ANOVA results for the students' opinions on the strengths of Facebook and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Connected to people	Between Groups	0.420	1	0.420	7.810	0.006**
	Within Groups	10.156	189	0.054		
Updated news	Between Groups	0.861	1	0.861	5.726	0.018*
	Within Groups	28.437	189	0.150		
Global exposure	Between Groups	0.015	1	0.015	.072	0.789
	Within Groups	40.718	189	0.215		
Free advertising	Between Groups	0.297	1	0.297	1.138	0.287
	Within Groups	49.295	189	0.261		
More personal connection	Between Groups	0.314	1	0.314	1.579	0.210
	Within Groups	37.623	189	0.199		
Making friends with similar interests	Between Groups	0.303	1	0.303	1.219	0.271
	Within Groups	47.026	189	0.249		

**p<0.01; * p < 0.05

Email

From the following statistics and ANOVA tables as shown in Tables 4.25 to 4.28, the p-values for two of the given purposes of using e-mail were rather large i.e. 'chat with lecturers and friends' (p = 0.189) and 'organise events using calendar' (p = 0.202) (see Tables 4.25 and 4.26) indicating that there were not enough evidence to reject the null hypothesis (p > 0.05). Hence,

there was no significant difference between the male and female students and their opinions on the purposes of ‘chat with lecturers and friends’ and ‘organise events using calendar’. Besides, the p-value for the strength of ‘attach files’ was 0.003 indicating that there was enough evidence to reject the null hypothesis ($p < 0.01$, see Tables 4.25 and 4.26). This means that the male and female students had different opinion on the purpose of ‘attach files’.

In addition, the p-values for the other two purposes of using email namely ‘send messages’ and ‘receive messages’ ($p = 0.042$ respectively) indicating two different interpretations (see Tables 4.25 and 4.26). If the significance level is set at 0.05, the null hypotheses would have been rejected as $p < 0.05$. However, when tested at a 0.01 significance level, the null hypotheses could not be rejected ($p > 0.01$). Hence, there was no significant difference between male and female students’ opinion on the purposes of sending and receiving email at a 0.01 significance level.

Besides, the results as shown in Tables 4.27 and 4.28 reveal that the p-values for all the given strengths of email were rather large i.e. ‘sharing of productive ideas’ ($p = 235$), **‘**archiving of information’ ($p = 0.723$), **‘**better collaboration’ ($p = 0.189$), **‘**reduce physical meetings’ ($p = 0.078$) and ‘can check email anywhere and anytime’ ($p = 0.074$) indicating that there were not enough evidence to reject the null hypotheses ($p > 0.05$). Thus, male and female students were in agreement on all the strengths of email given in the study.

The overall results show that the male and female students were in agreement on all the purposes and strengths of email given in the study except the opinion on the purpose of 'attach files'.

Table 4.25: Descriptive statistics for the students' opinions on the purposes of using email and students' gender

Purposes	Gender	N	Mean	Std. Dev.
Send messages	Male	96	1.10	0.37
	Female	95	1.02	0.14
Receive messages	Male	96	1.10	0.37
	Female	95	1.02	0.14
Chat with lecturers and friends	Male	96	1.45	0.54
	Female	95	1.55	0.50
Attach files	Male	96	1.16	0.42
	Female	95	1.02	0.14
Organise events using calendar	Male	96	1.86	0.40
	Female	95	1.79	0.41
Organise tasks to do	Male	96	1.79	0.46
	Female	95	1.73	0.45

Table 4.26: ANOVA results for the students' opinions on the purposes of using email and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Send messages	Between Groups	0.330	1	0.330	4.179	0.042*
	Within Groups		189	0.079		
Receive messages	Between Groups	0.330	1	0.330	4.179	0.042*
	Within Groups		189	0.079		
Chat with lecturers and friends	Between Groups	0.472	1	0.472	1.741	0.189
	Within Groups		189	0.271		
Attach files	Between Groups	0.873	1	0.873	8.862	0.003**
	Within Groups		189	0.098		
Organise events using calendar	Between Groups	0.269	1	0.269	1.641	0.202
	Within Groups		189	0.164		
Organise tasks to do	Between Groups	0.204	1	0.204	0.005	0.320
	Within Groups		189	0.205		

**p<0.01; * p < 0.05

Table 4.27: Descriptive statistics for the students' opinions on the strengths of email and students' gender

Strengths	Gender	N	Mean	Std. Dev.
Sharing of productive ideas	Male	96	1.50	0.54
	Female	95	1.41	0.49
Archiving of information	Male	96	1.46	0.54
	Female	95	1.43	0.50
Access to information	Male	96	1.37	0.53
	Female	95	1.25	0.44
Better collaboration	Male	96	1.58	0.54
	Female	95	1.48	0.50
Reduce physical meetings	Male	96	1.49	0.54
	Female	95	1.36	0.48
Can check email anywhere and anytime	Male	96	1.34	0.52
	Female	95	1.22	0.42

Table 4.28: ANOVA results for the students' opinions on the strengths of email and students' gender

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Sharing of productive ideas	Between Groups	0.382	1	0.382	1.417	0.235
	Within Groups	50.989	189	0.270		
Archiving of information	Between Groups	0.034	1	0.034	0.126	0.723
	Within Groups	51.139	189	0.271		
Access to information	Between Groups	0.715	1	0.715	3.041	0.083
	Within Groups	44.437	189	0.235		
Better collaboration	Between Groups	0.469	1	0.469	1.737	0.189
	Within Groups	51.060	189	0.270		
Reduce physical meetings	Between Groups	0.828	1	0.828	3.141	0.078
	Within Groups	49.821	189	0.264		
Can check email anywhere and anytime	Between Groups	0.719	1	0.719	3.234	0.074
	Within Groups	42.014	189	0.222		

Summary of H1a Testing

From the above data analysis a decision can be made toward accepting or rejecting the research null hypothesis as follows:

$H_0$1a: Students' gender does not have any significant effects on their perception towards the use of e-learning tools.

Table 4.29 shows the hypotheses for each learning tool and decision of acceptance or rejection for each tool. Based on the summary shown in Table 4.29, the decision of acceptance or rejection for the entire research null hypothesis ($H_0$1a) was made.

Table 4.29: Summary of research hypothesis (H1a) findings and the decisions

E-learning tool	Null Hypothesis	Decision
Blackboard E-learn	Students' gender does not have any significant effects on their perception towards the use of Blackboard E-learn.	Fail to reject null hypothesis.
Search engines	Students' gender does not have any significant effects on their perception towards the use of search engines.	Fail to reject null hypothesis.
Instant messaging	Students' gender does not have any significant effects on their perception towards the use of instant messaging.	Fail to reject null hypothesis.
YouTube	Students' gender does not have any significant effects on their perception towards the use of YouTube.	Partially rejected null hypothesis at a 0.05 significance level.
Ms PowerPoint	Students' gender does not have any significant effects on their perception towards the use of Ms PowerPoint.	Fail to reject null hypothesis.
Facebook	Students' gender does not have any significant effects on their perception towards the use of Facebook.	Partially rejected null hypothesis at a 0.05 significance level.
Email	Students' gender does not have any significant effects on their perception towards the use email.	Partially rejected null hypothesis at a 0.05 significance level.

Based on the summary of findings as shown in Figure 4.29, it can be concluded that the entire research null hypothesis ($H_0$1a) could only be partially rejected at a 0.05 significance level.

There was a significant difference between the students' gender and their perception towards the use of three e-learning tools. It include YouTube (p-value for the purpose of 'post video clips' was < 0.05, see Tables 4.13 and 4.14), Facebook (p-values for the purposes of 'upload documents/photos/videos', 'post comments' and 'chat with lecturers and classmates' as well as the strength of 'updated news' were < 0.05, see Tables 4.21 to 4.24) and email (p-values for the purposes of 'send messages' and 'received messages' were < 0.05, see Tables 4.25 to 4.26). In addition, there was significant difference among means found in two of the given e-learning tool at a 0.01 significance level namely Facebook and email in which the p-value for the strength of Facebook (i.e. 'connected to people) and the strength of email (i.e. 'attach file) were < 0.01.

The results show that male and female students had different perceptions toward the use of YouTube, Facebook and email. They were in agreement on the other four e-learning tools used in this study namely Blackboard E-learn, search engines, instant messaging and Ms PowerPoint.

b. The perception of students towards the use of e-learning tools by the level of study

Blackboard E-Learn

From the following statistics and ANOVA tables as shown in Tables 4.30 to 4.32, the p-values for all the given purposes of using Blackboard E-learn namely 'download course materials', 'upload assignment', 'participate in discussion board', 'self enrolment to subjects' 'check grades' and 'check announcements' were < 0.01 indicating that there were enough evidence to reject the null hypotheses (see Tables 4.30. and 4.31). Hence, there was significant difference among means. Students at different level of study had different opinion on the purposes of Blackboard E-learn given in the study.

Besides, the results also show that the p-values for two of the given strengths of Blackboard E-learn i.e. 'easy standardization of course materials' and 'streamlined distribution and updating of lecture notes' were < 0.01 (see Tables 4.32 and 4.33) indicating that there were enough evidence to reject the null hypotheses. Thus, the diploma and undergraduate students had different opinion on the strengths of 'easy standardization of course materials' and 'streamlined distribution and updating of lecture notes'.

For the strength of 'one point access', the p- value was rather large namely 0.211 (see Tables 4.32 and 4.33) indicating that there was not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, students at diploma and

undergraduate levels agreed that Blackboard E-learn is a one point access e-learning tool.

Overall, students' level of study has shown significant effects on the perception of students towards the use of Blackboard E-learn. Undergraduate students tend to have a better perception on e-learning tools due to the number of years studying in university and longer period of exposure of using e-learning tools compared to diploma students who are still new to the university environment after their high school.

Table 4.30: Descriptive statistics for the purposes of using Blackboard E-Learn and students' level of study

Purposes	Level of study	N	Mean	Std. Dev.
Download course materials	Diploma	94	1.50	0.73
	Undergraduate	97	1.08	0.28
Upload assignment	Diploma	94	2.02	0.51
	Undergraduate	97	1.66	0.48
Participate in discussion board	Diploma	94	2.07	0.45
	Undergraduate	97	1.84	0.37
Self-enrolment to subjects	Diploma	94	1.67	0.71
	Undergraduate	97	1.14	0.35
Check grades	Diploma	94	1.72	0.69
	Undergraduate	97	1.48	0.50
Check announcements	Diploma	94	1.65	0.71
	Undergraduate	97	1.20	0.40

Table 4.31: ANOVA results for the students' opinions on the purposes of using Blackboard E-Learn and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Download course materials	Between Groups	8.322	1	8.322	27.672	0.000**
	Within Groups	56.840	189	0.301		
Upload assignment	Between Groups	6.238	1	6.238	25.781	0.000**
	Within Groups	45.731	189	0.242		
Participate in discussion board	Between Groups	2.736	1	2.736	16.243	0.000**
	Within Groups	31.840	189	0.168		
Self-enrolment to subjects	Between Groups	13.202	1	13.202	42.467	0.000**
	Within Groups	58.756	189	0.311		
Check grades	Between Groups	2.724	1	2.724	7.457	0.007**

	Within Groups	69.035	189	0.365		
Check announcements	Between Groups	9.799	1	9.799	29.541	0.000**
	Within Groups	62.693	189	0.332		

** $p < 0.01$

Table 4.32: Descriptive statistics for the students' opinions on the strengths of Blackboard E-Learn and students' level of study

Strengths	Level of Study	N	Mean	Std. Dev.
One point of access	Diploma	94	1.77	0.68
	Undergraduate	97	1.66	0.48
Easy standardization of course materials	Diploma	94	1.60	0.72
	Undergraduate	97	1.36	0.48
Streamlined distribution and updating of lecture notes	Diploma	94	1.62	0.72
	Undergraduate	97	1.30	0.46

Table 4.33: ANOVA results for the students' opinions on the strengths of Blackboard E-Learn and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
One point of access	Between Groups	.538	1	.538	1.574	0.211
	Within Groups	64.624	189	.342		
Easy standardization of course materials	Between Groups	2.635	1	2.635	7.012	0.009**
	Within Groups	71.009	189	.376		
Streamlined distribution and updating of lecture notes	Between Groups	4.829	1	4.829	13.316	0.000**
	Within Groups	68.543	189	.363		

** $p < 0.01$

Search Engines

From the following statistics and ANOVA tables as shown in Tables 4.34 to 4.37, the p-values for all the given purposes of using search engines namely 'do research' ($p = 0.014$) and 'finding solutions to problems' ($p = 0.004$) were < 0.01 indicating that there were enough evidence to reject the null hypotheses (see Tables 4.34 and 4.37). Hence, students at different level of study had different opinion on the purposes of using search engines given in the study.

Besides, the results also show that the p-values for four of the given strengths of search engines i.e. ‘able to perform keyword research’ ($p = 0.032$), ‘provide quality information’ ($p = 0.024$) and ‘faster way in researching things’ ($p = 0.043$) were < 0.05 indicating two different interpretations (see Tables 4.36 and 4.37). If the significance level is set at 0.01, the null hypotheses could not be rejected as $p > 0.01$. However, when tested at a 0.05 significance level, the null hypotheses would have been rejected ($p > 0.05$). Hence, there was a significant difference between diploma and undergraduate students’ opinion on these strengths of search engines at a 0.05 significance level.

As for the strengths of ‘wide variety of information’ and ’easier way in researching, the p-values were rather large i.e. 0.103 and 0.057 respectively indicating that there were not enough evidence to reject the null hypotheses ($p > 0.05$). Hence, there was no significant difference between students’ level of study and their opinions on these strengths. They agreed that search engines provide an easier way in researching for wide variety of information.

The overall results show that students’ level of study had significant effects on the perception of students toward the use of search engines but at a very minimal level. Generally, undergraduate students tend to have a better knowledge in using search engines compared to diploma students.

Table 4.34: Descriptive statistics for the students' opinions on the purposes of using search engines and students' level of study

Purposes	Level of Study	N	Mean	Std. Dev.
Do research	Diploma	94	1.11	0.31
	Undergraduate	97	1.02	0.14
Finding solutions to problems	Diploma	94	1.13	0.34
	Undergraduate	97	1.30	0.47

Table 4.35: ANOVA results for the students' opinions on the purposes of using search engines and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Do research	Between Groups	0.351	1	0.351	6.091	0.014**
	Within Groups	10.895	189	0.058		
Finding solutions to problems	Between Groups	1.401	1	1.401	8.597	0.004**
	Within Groups	30.798	189	0.163		

** $p < 0.01$

Table 4.36: Descriptive statistics for the students' opinions on the strengths of search engines and students' level of study

Strengths	Level of Study	N	Mean	Std. Dev.
Able to perform keyword research	Diploma	94	1.41	0.50
	Undergraduate	97	1.27	0.45
Provide quality information	Diploma	94	1.38	0.49
	Undergraduate	97	1.55	0.50
Wide variety of information	Diploma	94	1.30	0.46
	Undergraduate	97	1.20	0.40
Faster way in researching things	Diploma	94	1.19	0.40
	Undergraduate	97	1.32	0.47
Easier way in researching things	Diploma	94	1.18	0.39
	Undergraduate	97	1.30	0.46

Table 4.37: ANOVA results for the students' opinions on the strengths of search engines and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Able to perform keyword research	Between Groups	1.030	1	1.030	4.649	0.032*
	Within Groups	41.850	189	0.221		
Provide quality information	Between Groups	1.275	1	1.275	5.209	0.024*
	Within Groups	46.254	189	0.245		
Wide variety of information	Between Groups	0.497	1	0.497	2.687	0.103
	Within Groups	34.938	189	0.185		
Faster way in researching things	Between Groups	0.783	1	0.783	4.153	0.043*
	Within Groups	35.646	189	0.189		
Easier way in researching things	Between Groups	0.666	1	0.666	3.675	0.057
	Within Groups	34.255	189	0.181		

* $p < 0.05$

Instant Messaging

From the following statistics and ANOVA tables as shown in Tables 4.38 to 4.41, the p-value for one of the purposes of using instant messaging namely 'chat with lecturers and friends' was < 0.01 (p = 0.005, see Tables 4.38. and 4.39) indicating that there was enough evidence to reject the null hypothesis. Hence, students at different level of study had different opinion on the purpose of using instant messaging to chat with lecturers and friends.

Besides, the results also show that the p-values for the other purposes of using instant messaging i.e. upload files (p = 0.045), send files (p = 0.036), discuss assignments (p = 0.041) and participate in chat rooms (p = 0.029) were < 0.05 indicating two different interpretations (see Tables 4.38 and 4.39). If the significance level is set at 0.01, the null hypotheses could not be rejected as p > 0.01. However, when tested at a 0.05 significance level, the null hypotheses would have been rejected (p > 0.05). Hence, there was a significant difference between diploma and undergraduate students' opinion on these purposes of using instant messaging at a 0.05 significance level.

Furthermore, the results also show that the p-values for all the strengths of instant messaging given in the study namely 'simple and fast' (p = 0.037), 'cheap' (p = 0.044), 'feasible communication' (p = 0.015) and 'good platform for socializing' (p = 0.045) were < 0.05 indicating two different interpretations (see Tables 4.40 and 4.41). If the significance level is set at a 0.01 significance

level, the null hypotheses could not be rejected ($p > 0.01$). However, when tested at a 0.05 significance level, the null hypotheses would have been rejected as $p < 0.05$. Hence, there was a significant difference between diploma and undergraduate students' opinion on all the given strengths of instant messaging at a 0.05 significance level.

Based on the results as shown in Tables 4.38 to 4.41, it can be concluded that students' level of study had some significant effects on the perception of students toward the use of instant messaging.

Table 4.38: Descriptive statistics for the students' opinions on the purposes of using instant messaging and students' level of study

Purposes	Level of Study	N	Mean	Std. Dev.
Chat with lecturers and friends	Diploma	94	1.35	0.52
	Undergraduate	97	1.16	0.34
Upload files	Diploma	94	1.49	0.54
	Undergraduate	97	1.64	0.49
Send files	Diploma	94	1.32	0.51
	Undergraduate	97	1.47	0.50
Discuss assignments	Diploma	94	1.41	0.54
	Undergraduate	97	1.27	0.45
Participate in chat rooms	Diploma	94	1.63	0.53
	Undergraduate	97	1.46	0.50

Table 4.39: ANOVA results for the students' opinions on the purposes of using instant messaging and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Chat with lecturers and friends	Between Groups	1.654	1	1.654	8.060	0.005**
	Within Groups	38.776	189	0.205		
Upload files	Between Groups	1.071	1	1.071	4.061	0.045*
	Within Groups	49.860	189	0.264		
Send files	Between Groups	1.148	1	1.148	4.464	0.036*
	Within Groups	48.611	189	.257		
Discuss assignments	Between Groups	1.030	1	1.030	4.244	0.041*
	Within Groups	45.850	189	.243		
Participate in chat rooms	Between Groups	1.280	1	1.280	4.829	0.029*
	Within Groups	50.092	189	.265		

** $p < 0.01$; * $p < 0.05$

Table 4.40: Descriptive statistics for the students' opinions on the strengths of instant messaging and students' level of study

Strengths	Level of Study	N	Mean	Std. Dev.
Simple and fast	Diploma	94	1.29	0.50
	Undergraduate	97	1.15	0.36
Cheap	Diploma	94	1.47	0.54
	Undergraduate	97	1.32	0.47
Feasible communication	Diploma	94	1.61	0.53
	Undergraduate	97	1.42	0.50
Good platform for socializing	Diploma	94	1.50	0.54
	Undergraduate	97	1.35	0.48

Table 4.41: ANOVA results for the students' opinions on the strengths of instant messaging and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Simple and fast	Between Groups	0.839	1	0.839	4.416	0.037*
	Within Groups	35.925	189	0.190		
Cheap	Between Groups	1.053	1	1.053	4.103	0.044*
	Within Groups	48.497	189	0.257		
Feasible communication	Between Groups	1.611	1	1.611	6.077	0.015*
	Within Groups	50.106	189	0.265		
Good platform for socializing	Between Groups	1.067	1	1.067	4.066	0.045*
	Within Groups	49.582	189	0.262		

* $p < 0.05$

YouTube

From the following statistics and ANOVA tables as shown in Tables 4.42 to 4.45, the p-values for one of the given purposes of using YouTube was large i.e. 'download video clips' ($p = 0.755$) (see Tables 4.42 and 4.43) indicating that there was not enough evidence to reject the null hypothesis ($p > 0.05$). Hence, there was no significant difference between the students' level of study and their opinions on the purpose of 'download video clips. This means that they agreed that YouTube can be used to download video clips.

For the purpose of ‘edit video clips’, the p-value was < 0.01 (p = 0.009, see Tables 4.42 and 4.43) indicating that there was enough evidence to reject the null hypothesis (p < 0.01). This means that the diploma and undergraduate students had different opinion on the purpose of using YouTube to edit video clips. As for the other two purposes of using YouTube namely ‘post video clips’ (p = 0.029) and ‘video clips sharing’ (p = 0.049), their p-values were < 0.05 indicating two different interpretations (see Tables 4.42 and 4.43). If the significance level is set at a 0.01 significance level, the null hypotheses could not be rejected (p > 0.01). However, when tested at a 0.05 significance level, the null hypotheses would have been rejected as p < 0.05. Hence, there was a significant difference between diploma and undergraduate students’ opinion on the purposes of using YouTube to post and share video clips at a 0.05 significance level.

Furthermore, the results as shown in Tables 4.44 and 4.45 reveal that the p-values for four of the given strengths of YouTube were large i.e. ‘simple to use the website’ (p = 0.446), ‘availability of updated video clips’ (p = 0.437), ‘watch video with a click of a button’ (p = 0.174), and ‘users are able to control video clips’ (p = 0.767) indicating that there were not enough evidence to reject the null hypothesis (p > 0.05). Thus, diploma and undergraduate students were in agreement on all the strengths of YouTube given in the study except the ‘ability to broadcast to millions of viewers’ (p = 0.035).

For the strength of 'ability to broadcast to millions of viewers', the p-value was < 0.05 indicating two different interpretations (see Tables 4.44 and 4.45). If the significance level is set at a 0.05 significance level, the null hypotheses would have been rejected ($p < 0.05$). However, when tested at a 0.01 significance level, the null hypotheses could not be rejected as $p > 0.01$. Hence, there was no significant difference between diploma and undergraduate students' opinion on this strength of YouTube a 0.01 significance level.

Therefore, students' level of study does not have significant effects on the perception of students towards the use of YouTube. This indicates that students at different level of study did not have different opinion towards the use of YouTube. They agreed that YouTube is basically used to post video clips. They also admitted the strengths of the YouTube namely its strengths which are simple to use the website, availability of updated video clips, watch video with a click of a button and users are able to control video clips.

Table 4.42: Descriptive statistics for the students' opinions on the purposes of using YouTube and students' level of study

Purposes	Level of Study	N	Mean	Std. Dev.
Post video clips	Diploma	94	1.70	0.46
	Undergraduate	97	1.84	0.37
Download video clips	Diploma	94	1.37	0.49
	Undergraduate	97	1.35	0.48
Video clips sharing	Diploma	94	1.61	0.49
	Undergraduate	97	1.46	0.50
Edit video clips	Diploma	94	1.83	0.38
	Undergraduate	97	1.95	0.22

Table 4.43: ANOVA results for the students' opinions on the purposes of using YouTube and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Post video clips	Between Groups	0.843	1	0.843	4.828	0.029*
	Within Groups	33.020	189	0.175		
Download video clips	Between Groups	0.023	1	0.023	0.098	0.755
	Within Groups	44.051	189	0.233		
Video clips sharing	Between Groups	.969	1	.969	3.933	0.049*
	Within Groups	46.560	189	.246		
Edit video clips	Between Groups	.672	1	.672	7.051	0.009**
	Within Groups	18.019	189	.095		

** $p < 0.01$; * $p < 0.05$

Table 4.44: Descriptive statistics for the students' opinions on the strengths of YouTube and students' level of study

Strengths	Level of Study	N	Mean	Std. Dev.
Simple to use the website	Diploma	94	1.37	0.49
	Undergraduate	97	1.32	0.47
Availability of updated video clips	Diploma	94	1.49	0.50
	Undergraduate	97	1.43	0.50
Watch video with a click of a button	Diploma	94	1.24	0.43
	Undergraduate	97	1.16	0.37
Ability to broadcast to millions of viewers	Diploma	94	1.40	0.49
	Undergraduate	97	1.56	0.50
Users are able to control video clips	Diploma	94	1.70	0.46
	Undergraduate	97	1.72	0.45

Table 4.45: ANOVA results for the students' opinions on the strengths of YouTube and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Simple to use the website	Between Groups	0.133	1	0.133	0.583	0.446
	Within Groups	43.061	189	0.228		
Availability of updated video clips	Between Groups	0.152	1	0.152	0.606	0.437
	Within Groups	47.304	189	0.250		
Watch video with a click of a button	Between Groups	0.303	1	0.303	1.866	0.174
	Within Groups	30.733	189	0.163		
Ability to broadcast to millions of viewers	Between Groups	1.109	1	1.109	4.502	0.035*
	Within Groups	46.576	189	0.246		
Users are able to control video clips	Between Groups	0.018	1	0.018	0.088	0.767
	Within Groups	39.144	189	0.207		

* $p < 0.05$

Ms PowerPoint

From the following statistics and ANOVA tables as shown in Tables 4.46 to 4.49, the p-value for one of the given purposes of using Ms PowerPoint was < 0.01 (see Tables 4.46 and 4.47) indicating that there was enough evidence to reject the null hypothesis ($p < 0.01$). This means that the diploma and undergraduate students had different opinion on the purpose of using Ms PowerPoint in creating slides.

For the other three given purposes of using Ms Power Point i.e. 'edit slides' ($p = 0.042$), 'publish slides in web browser' ($p = 0.046$) and 'view slides' ($p = 0.025$), the p-values were < 0.05 indicating two different interpretations (see Tables 4.46 and 4.47). If the significance level is set at a 0.01 significance level, the null hypotheses could not be rejected ($p > 0.01$). However, when tested at a 0.05 significance level, the null hypotheses would have been rejected as $p < 0.05$. Hence, there was a significant difference between diploma and undergraduate students' opinion on the purposes of using Ms Power Point to edit slides, publish slides in web browser and view slides at a 0.05 significance level.

Furthermore, the results as shown in Tables 4.48 and 4.49 reveal that the p-values for three of the given strengths of Ms Power Point were < 0.05 i.e. 'increase motivation' ($p = 0.019$), 'benefits over basic presentations' ($p = 0.010$) and 'aid retention' ($p = 0.029$) indicating two different interpretations. If the significance level is set at a 0.01 significance level, the null hypotheses

could not be rejected ($p > 0.01$). However, when tested at a 0.05 significance level, the null hypotheses would have been rejected as $p < 0.05$. Hence, there was a significant difference between diploma and undergraduate students' opinion on these strengths of Ms PowerPoint at a 0.05 significance level.

However, the results also have shown that the p-value for the strength of 'better design compared to Overhead Projection (OHP) slides' was very large i.e. 0.853 indication that there was not enough evidence to reject the null hypothesis ($p > 0.05$, see Tables 4.48 and 4.49). This indicated that students at different level of study agreed that Ms PowerPoint has better design compared to Overhead Projection (OHP) slides.

Overall, students' level of study had significant effects on the perception of students towards the use of Ms PowerPoint.

Table 4.46: Descriptive statistics for the students' opinions on the purposes of using Ms PowerPoint and students' level of study

Purposes	Level of Study	N	Mean	Std. Dev.
Create slides	Diploma	94	1.35	0.56
	Undergraduate	97	1.05	0.30
Edit slides	Diploma	94	1.41	0.58
	Undergraduate	97	1.26	0.49
Publish slides in web browser	Diploma	94	1.85	0.46
	Undergraduate	97	1.71	0.50
View slides	Diploma	94	1.35	0.56
	Undergraduate	97	1.19	0.44

Table 4.47: ANOVA results for the students' opinions on the purposes of using Ms PowerPoint and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Create slides	Between Groups	4.283	1	4.283	21.213	0.000**
	Within Groups	38.157	189	0.202		
Edit slides	Between Groups	1.179	1	1.179	4.175	0.042*

	Within Groups	53.376	189	0.282		
Publish slides in web	Between Groups	0.932	1	0.932	4.019	0.046*
browser	Within Groups	43.832	189	0.232		
View slides	Between Groups	1.308	1	1.308	5.140	0.025*
	Within Groups	48.075	189	0.254		

** p < 0.01; * p < 0.05

Table 4.48: Descriptive statistics for the students' opinions on the strengths of Ms PowerPoint and students' level of study

Strengths	Level of Study	N	Mean	Std. Dev.
Increase motivation	Diploma	94	1.62	0.57
	Undergraduate	97	1.79	0.46
Benefits over basic presentations	Diploma	94	1.23	0.52
	Undergraduate	97	1.07	0.33
Aid retention	Diploma	94	1.67	0.56
	Undergraduate	97	1.49	0.54
Better design compared to OHP slides	Diploma	94	1.49	0.58
	Undergraduate	97	1.47	0.54

Table 4.49: ANOVA results for the students' opinions on the strengths of Ms PowerPoint and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Increase motivation	Between Groups	1.492	1	1.492	5.630	0.019*
	Within Groups	50.089	189	0.265		
Benefits over basic presentations	Between Groups	1.251	1	1.251	6.689	0.010*
	Within Groups	35.346	189	0.187		
Aid retention	Between Groups	1.468	1	1.468	4.866	0.029*
	Within Groups	57.024	189	.302		
Better design compared to OHP	Between Groups	0.011	1	0.011	0.035	0.853
slides	Within Groups	59.675	189	.316		

* p < 0.05

Facebook

From the following statistics and ANOVA tables as shown in Tables 4.50 to 4.53, the p-values for two of the given purposes of using Facebook ware large i.e. 'upload documents/photos/videos' (p = 0.192) and 'post comments' (p = 0.955) (see Tables 4.50 and 4.51) indicating that there were

not enough evidence to reject the null hypotheses ($p > 0.05$). Hence, there was no significant difference between the students' level of study and their opinions on these purposes of using Facebook. This means that the diploma and undergraduate students agreed that Facebook can be used to upload documents, photos or videos as well as to post comments.

Besides, the other three of the given purposes of using Facebook, the p-values were < 0.05 i.e. 'chat with lecturers and classmates' ($p = 0.011$), 'create group' ($p = 0.020$) and create ads (advertising purposes) ($p = 0.037$) indicating two different interpretations (see Tables 4.50 and 4.51). If the significance level is set at a 0.01 significance level, the null hypotheses could not be rejected ($p > 0.01$). However, when tested at a 0.05 significance level, the null hypotheses would have been rejected as $p < 0.05$. Hence, there was a significant difference between diploma and undergraduate students' opinion on the purposes of using Facebook to chat with lecturers and friends as well as to create group and ads at a 0.05 significance level.

Furthermore, the results as shown in Tables 4.52 and 4.53 reveal that the p-values for three the given strengths of Facebook were large i.e. 'global exposure' ($p = 0.624$), 'more personal connection' ($p = 0.443$) and 'making friends with similar interests' ($p = 0.904$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, diploma and undergraduate students could be in agreement on these strengths of Facebook.

As for the strengths of ‘connected to people’ ($p = 0.028$), ‘updated news’ ($p = 0.033$) and ‘free advertising’ ($p = 0.038$), the p-values were < 0.05 indicating two different interpretations (see Tables 4.52 and 4.53). If the significance level is set at a 0.05 significance level, the null hypotheses would have been rejected ($p < 0.05$). However, when tested at a 0.01 significance level, the null hypotheses could not be rejected as $p > 0.01$. Hence, there was no significant difference between diploma and undergraduate students’ opinion on these strengths of Facebook at a 0.01 significance level.

Therefore, students’ level of study had some significant effects on the perception of students towards the use of Facebook. The results also showed that regardless of the level of study, they agreed that Facebook is basically used to accomplish general tasks such as upload documents/photos/videos and post comments. They were in agreement on some of the given strengths of the Facebook such as global exposure, more personal connection making friends with similar interests. However, they possessed different opinion in the use of Facebook to chat with lecturers and classmates, create group and create ads (advertising purposes).

Overall, it can be concluded students’ level of study had some significant effects on their perception towards the use of Facebook depends on its usage and strengths.

Table 4.50: Descriptive statistics for the students' opinions on the purposes of using Facebook and students' level of study

Purposes	Level of Study	N	Mean	Std. Dev.
Upload documents/photos/videos	Diploma	94	1.15	0.41
	Undergraduate	97	1.08	0.28
Post comments	Diploma	94	1.07	0.30
	Undergraduate	97	1.07	0.26
Chat with lecturers and classmates	Diploma	94	1.23	0.45
	Undergraduate	97	1.09	0.29
Create group	Diploma	94	1.53	0.52
	Undergraduate	97	1.36	0.48
Create ads (advertising purposes)	Diploma	94	1.80	0.43
	Undergraduate	97	1.66	0.48

Table 4.51: ANOVA results for the students' opinions on the purposes of using Facebook and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Upload documents/photos/ videos	Between Groups	0.211	1	0.211	1.714	0.192
	Within Groups	23.255	189	0.123		
Post comments	Between Groups	0.000	1	0.000	0.003	0.955
	Within Groups	14.974	189	0.079		
Chat with lecturers and classmates	Between Groups	0.953	1	0.953	6.664	0.011*
	Within Groups	27.016	189	0.143		
Create group	Between Groups	1.397	1	1.397	5.528	0.020*
	Within Groups	47.775	189	0.253		
Create ads (advertising purposes)	Between Groups	0.910	1	0.910	4.418	0.037*
	Within Groups	38.933	189	0.206		

* $p < 0.05$

Table 4.52: Descriptive statistics for the students' opinions on the strengths of Facebook and students' level of study

Strengths	Level of Study	N	Mean	Std. Dev.
Connected to people	Diploma	94	1.09	0.32
	Undergraduate	97	1.01	0.10
Updated news	Diploma	94	1.23	0.45
	Undergraduate	97	1.11	0.32
Global exposure	Diploma	94	1.27	0.47
	Undergraduate	97	1.30	0.46
Free advertising	Diploma	94	1.39	0.51
	Undergraduate	97	1.55	0.50
More personal connection	Diploma	94	1.28	0.47
	Undergraduate	97	1.23	0.42
Making friends with similar interests	Diploma	94	1.38	0.51
	Undergraduate	97	1.39	0.49

Table 4.53: ANOVA results for the students' opinions on the strengths of Facebook and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Connected to people	Between Groups	0.267	1	0.267	4.897	0.028*
	Within Groups	10.309	189	0.055		
Updated news	Between Groups	0.695	1	0.695	4.591	0.033*
	Within Groups	28.604	189	0.151		
Global exposure	Between Groups	0.052	1	0.052	0.242	0.624
	Within Groups	40.681	189	0.215		
Free advertising	Between Groups	1.114	1	1.114	4.344	0.038*
	Within Groups	48.477	189	0.256		
More personal connection	Between Groups	0.118	1	0.118	0.591	0.443
	Within Groups	37.819	189	0.200		
Making friends with similar interests	Between Groups	0.004	1	0.004	0.015	0.904
	Within Groups	47.326	189	0.250		

* $p < 0.05$

Email

From the following statistics and ANOVA tables as shown in Tables 4.54 to 4.57, the p-value for one of the given purposes of using email was rather large i.e. 'receive messages' ($p = 0.114$) (see Tables 4.54 and 4.55) indicating that there was not enough evidence to reject the null hypotheses ($p > 0.05$). Hence, there was no significant difference between the students' level of study and their opinions on this purpose of using email. This means that the diploma and undergraduate students were in agreement on the purpose of 'receive messages'.

Besides, the rest of the given purposes of using email, the p-values were < 0.05 i.e. 'send messages' ($p = 0.036$), 'chat with lecturers and friends' ($p = 0.010$), 'attach files' ($p = 0.036$) and 'organise events using calendar' ($p = 0.026$) indicating two different interpretations (see Tables 4.54 and 4.55). If the significance level is set at a 0.01 significance level, the null hypotheses could

not be rejected ($p > 0.01$). However, when tested at a 0.05 significance level, the null hypotheses would have been rejected as $p < 0.05$. Hence, there was a significant difference between diploma and undergraduate students' opinion on these purposes of using email at a 0.05 significance level.

Furthermore, the results as shown in Tables 4.56 and 4.57 reveal that the p-value for two of the given strengths of email were rather large i.e. 'access to information' ($p = 0.663$) and 'can check email anywhere and anytime' ($p = 0.050$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, diploma and undergraduate students could be in agreement on these strengths of email.

As for the rest of the strengths of email, i.e. 'sharing of productive ideas' ($p = 0.045$), 'archiving of information' ($p = 0.022$), 'better collaboration' ($p = 0.030$) and 'reduce physical meetings' ($p = 0.045$), the p-values were < 0.05 indicating two different interpretations (see Tables 4.56 and 4.57). If the significance level is set at a 0.05 significance level, the null hypotheses would have been rejected ($p < 0.05$). However, when tested at a 0.01 significance level, the null hypotheses could not be rejected as $p > 0.01$. Hence, there was no significant difference between diploma and undergraduate students' opinion on these strengths of email at a 0.01 significance level.

Therefore, students' level of study had some significant effects on the perception of students towards the use of email. The results also showed that there was a significant difference between students' level of study and their

opinion on the purposes of using email and its strengths. They agreed that email is a tool used to receive messages. They were also in agreement on the given strengths of the email such as 'access to information' and 'can check email anywhere and anytime'. However, they had different opinion in the use of email to send messages, chat with lecturers and friends, attach files and organise events using calendar as well as some of its strengths (i.e. sharing of productive ideas, archiving of information, better collaboration and reduce physical meetings).

Table 4.54: Descriptive statistics for the students' opinions on the purposes of using email and students' level of study

Purposes	Level of Study	N	Mean	Std. Dev.
Send messages	Diploma	94	1.11	0.37
	Undergraduate	97	1.02	0.14
Receive messages	Diploma	94	1.10	0.36
	Undergraduate	97	1.03	0.17
Chat with lecturers and friends	Diploma	94	1.60	0.54
	Undergraduate	97	1.40	0.49
Attach files	Diploma	94	1.14	0.40
	Undergraduate	97	1.04	0.20
Organise events using calendar	Diploma	94	1.89	0.37
	Undergraduate	97	1.76	0.43

Table 4.55: ANOVA results for the students' opinions on the purposes of using email and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Send messages	Between Groups	0.351	1	0.351	4.456	0.036*
	Within Groups	14.895	189	0.079		
Receive messages	Between Groups	0.201	1	0.201	2.519	0.114
	Within Groups	15.046	189	0.080		
Chat with lecturers and friends	Between Groups	1.791	1	1.791	6.775	0.010*
	Within Groups	49.958	189	0.264		
Attach files	Between Groups	0.450	1	0.450	4.465	0.036*
	Within Groups	19.037	189	0.101		

Organise events using calendar	Between Groups	0.816	1	0.816	5.059	0.026*
	Within Groups	30.483	189	0.161		

* $p < 0.05$

Table 4.56: Descriptive statistics for the students' opinions on the strengths of email and students' level of study

Strengths	Level of Study	N	Mean	Std. Dev.
Sharing of productive ideas	Diploma	94	1.53	0.54
	Undergraduate	97	1.38	0.49
Archiving of information	Diploma	94	1.53	0.54
	Undergraduate	97	1.36	0.48
Access to information	Diploma	94	1.33	0.52
	Undergraduate	97	1.30	0.46
Better collaboration	Diploma	94	1.62	0.53
	Undergraduate	97	1.45	0.50
Reduce physical meetings	Diploma	94	1.50	0.54
	Undergraduate	97	1.35	0.48
Can check email anywhere and anytime	Diploma	94	1.35	0.52
	Undergraduate	97	1.22	0.41

Table 4.57: ANOVA results for the students' opinions on the strengths of email and students' level of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Sharing of productive ideas	Between Groups	1.081	1	1.081	4.062	0.045*
	Within Groups	50.291	189	0.266		
Archiving of information	Between Groups	1.397	1	1.397	5.306	0.022*
	Within Groups	49.775	189	0.263		
Access to information	Between Groups	0.045	1	0.045	0.190	0.663
	Within Groups	45.106	189	0.239		
Better collaboration	Between Groups	1.275	1	1.275	4.794	0.030*
	Within Groups	50.254	189	0.266		
Reduce physical meetings	Between Groups	1.067	1	1.067	4.066	0.045*
	Within Groups	49.582	189	0.262		
Can check email anywhere and anytime	Between Groups	0.864	1	0.864	3.902	0.050
	Within Groups	41.869	189	0.222		

* $p < 0.05$

Overall, students' level of study had some significant effects on their perception towards the use of email depends on its usage and strengths.

Summary of H1b Testing

From the above data analysis a decision can be made toward accepting or rejecting the research null hypothesis as follows:

$H_0$1b: Students' level of study does not have any significant effects on their perception towards the use of e-learning tools.

Table 4.58 shows the hypotheses for each learning tool and decision of acceptance or rejection for each tool. Based on the summary shown in Table 4.58, the decision of acceptance or rejection for the entire research null hypothesis ($H_0$1b) was made.

Table 4.58: Summary of research hypothesis (H1b) findings and the decisions

E-learning tool	Null Hypothesis	Decision
Blackboard E-learn	Students' level of study does not have any significant effects on their perception towards the use of Blackboard E-learn.	Partially rejected null hypothesis at a 0.05 significance level.
Search engines	Students' level of study does not have any significant effects on their perception towards the use of search engines.	Partially rejected null hypothesis at a 0.05 significance level.
Instant messaging	Students' level of study does not have any significant effects on their perception towards the use of instant messaging.	Rejected null hypothesis at a 0.05 significance level.
YouTube	Students' level of study does not have any significant effects on their perception towards the use of YouTube.	Partially rejected null hypothesis at a 0.05 significance level.

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Ms PowerPoint	Students' level of study does not have any significant effects on their perception towards the use of Ms PowerPoint.	Partially rejected null hypothesis at a 0.05 significance level.
Facebook	Students' level of study does not have any significant effects on their perception towards the use of Facebook.	Partially rejected null hypothesis at a 0.05 significance level.
Email	Students' level of study does not have any significant effects on their perception towards the use email.	Partially rejected null hypothesis at a 0.05 significance level.

The results show that the students' level of study had some significant effects on their perception towards the use of all the given e-learning tools in the study. The results are summarised as follows:

- **Blackboard E-learn:** p-values for all the purposes and strengths given in the study were < 0.01 except the strength of 'one point access' (see Tables 4.30 to 4.33),
- **Search engines:** p-values for the purposes of 'do research' as well as the strengths of 'able to perform keyword research', 'provide quality information' and faster way in researching things' were < 0.05 (see Tables 4.34 to 4.37),
- **Instant messaging:** p-values for the purpose of 'upload files', send files', discuss assignments' and 'participate in chat rooms' as well as the strengths of 'simple and fast', 'cheap', feasible communication' and 'good platform for socializing' were < 0.05 (see Tables 4.38 to 4.41),

- **YouTube:** p-values for the purposes of ‘post video clips’ and ‘video clips sharing’ as well as the strength of ‘ability to broadcast to millions of viewers were < 0.05 (see Tables 4.42 to 4.45),
- **Ms PowerPoint:** p-values for the purposes of ‘edit slides’, ‘publish slides in web browser’ and ‘view slides’ as well as the strengths of ‘increase motivation’, ‘benefits over basic presentations’ and ‘aid retention’ were < 0.05 (see Tables 4.46 to 4.49),
- **Facebook:** p-values for the purposes of ‘chat with lecturers and classmates’, ‘create group’ and ‘create ads’ as well as the strengths of ‘connected to people’, updated news’ and free advertising’ were < 0.05 (see Tables 4.50 to 4.53) and
- **Email:** p-values for the purposes of ‘send messages’, chat with lecturers and friends’, ‘attach files’, ‘organise events using calendar’ and ‘organise tasks to do’ as well as the strengths of ‘sharing of productive ideas’, archiving of information’, better collaboration’, reduce physical meetings’ and ‘can check email anywhere and anytime’ were < 0.05 (see Tables 4.54 to 4.57).

Overall, the results show that students at different level of study had different opinions on the purposes and strengths given in the study. Both diploma and undergraduate students had different perception towards the use of e-learning tools may due to the following reasons: This is likely that undergraduate students tend to have a higher usage of these tools compared to

diploma students. It is because diploma students are still new to these e-learning tools as they just graduated from their high school and about to enter University. As for undergraduate students, they have been exposed to these e-learning tools for a number of years and the exposure level are much wider than diploma students.

Based on the summary of findings as shown in Figure 4.58, the entire research null hypothesis ($H_0$1b) could only be partially rejected. There was significant difference among means found in most of the students' opinion on the purposes and strengths of the given e-learning tools.

c. The perception of students toward e-learning tools by school of study groups

The section presents the results of the testing on H1c to examine whether or not students' school of study have significant effects on the perception of students towards the given e-learning tools in the study. There were five schools involved in the study as below:

- School of Computer Technology (SCT),
- School of Creative Arts & Communication (SCAC),
- School of Hospitality, Tourism & Leisure Management (SHTLM),
- Sunway University Business School (SUBS) and
- School of Health & Natural Sciences (SHNS).

Blackboard E-Learn

From the following statistics and ANOVA tables as shown in tables 4.59 to 4.62, the p-values for four of the given purposes of using Blackboard E-learn namely 'upload assignment', 'self enrolment to subjects', 'check grades' and 'check announcements' were 0.000 respectively ($p < 0.01$, see tables 4.59 and 4.60) indicating that there were strong evidence to reject the null hypotheses Hence, students from different schools had different opinion on the purposes of using Blackboard E-learn given in the study.

As for the purpose of 'download course materials' ($p = 0.047$), the p-value was < 0.05 indicating two different interpretations (see Tables 4.59 and 4.60). If the significance level is set at a 0.05 significance level, the null hypotheses would have been rejected ($p < 0.05$). However, when tested at a 0.01 significance level, the null hypotheses could not be rejected as $p > 0.01$. Hence, there was no significant difference between students from all the schools on this purpose at a 0.01 significance level.

However, p-value for one of the given purposes of using Blackboard E-learn was rather large i.e. 'participate in discussion board' ($p = 0.227$) indicating that there was not enough evidence to reject the null hypotheses ($p > 0.05$, see Tables 4.59 and 4.60). Hence, there was no significant difference between the students' school of study and their opinions on this purpose of using Blackboard E-learn. This means that students in all five schools were in agreement on the purpose of 'participate in discussion board'.

Furthermore, p-value for a given strength of using Blackboard E-learn namely 'streamlined distribution and updating of lecture notes' ($p = 0.000$) was < 0.01 indicating that there was strong evidence to reject the null hypotheses (see Tables 4.61. and 4.62). Hence, students from different school of study had different opinions on this strength of using Blackboard E-learn.

Besides, the results also show that the p-value for one of the given strengths of Blackboard E-learn i.e. 'easy standardization of course materials' ($p = 0.010$) was < 0.05 indicating two different interpretations (see Tables 4.61 and 4.62). If the significance level is set at 0.01, the null hypotheses could not be rejected as $p > 0.01$. However, when tested at a 0.05 significance level, the null hypotheses would have been rejected ($p > 0.05$). Hence, there was a significant difference between students' opinion on this strength of Blackboard E-learn at a 0.05 significance level.

As for the other strength of using Blackboard E-learn, the p-value was rather large i.e. 'one point of access' ($p = 0.222$, see Tables 4.61 and 4.62) indicating that there was not enough evidence to reject the null hypotheses ($p > 0.05$). Hence, there was no significant difference between the students' school of study and their opinions on this strength of using Blackboard E-learn. This means that students in all the five schools agreed that Blackboard E-learn is an one point of access e-learning tool.

Table 4.59: Descriptive statistics for the purposes of using Blackboard E-Learn and students' school of study

Purposes	School of study	N	Mean	Std. Dev
Download course materials	SCT	39	1.21	0.41
	SCAC	48	1.44	0.77
	SHTLM	40	1.20	0.41
	SUBS	39	1.15	0.37
	SHNS	25	1.48	0.82
Upload assignment	SCT	39	1.54	0.51
	SCAC	48	2.04	0.54
	SHTLM	40	1.80	0.41
	SUBS	39	1.82	0.39
	SHNS	25	2.00	0.65
Participate in discussion board	SCT	39	1.92	0.27
	SCAC	48	2.06	0.52
	SHTLM	40	1.88	0.34
	SUBS	39	1.90	0.31
	SHNS	25	2.00	0.65
Self-enrolment to subjects	SCT	39	1.21	0.41
	SCAC	48	1.85	0.69
	SHTLM	40	1.23	0.42
	SUBS	39	1.15	0.37
	SHNS	25	1.52	0.82
Check grades	SCT	39	1.51	0.51
	SCAC	48	1.79	0.71
	SHTLM	40	1.63	0.49
	SUBS	39	1.28	0.46
	SHNS	25	1.84	0.75
Check announcements	SCT	39	1.13	0.34
	SCAC	48	1.81	0.70
	SHTLM	40	1.45	0.50
	SUBS	39	1.15	0.37
	SHNS	25	1.48	0.82

Table 4.60: ANOVA results for the purposes of using Blackboard E-Learn and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Download course materials	Between Groups	3.274	4	0.818	2.460	0.047*
	Within Groups	61.888	186	0.333		
Upload assignment	Between Groups	6.216	4	1.554	6.318	0.000**
	Within Groups	45.753	186	0.246		
Participate in discussion board	Between Groups	1.029	4	0.257	1.427	0.227
	Within Groups	33.546	186	0.180		
Self-enrolment to subjects	Between Groups	15.328	4	3.832	12.586	0.000**
	Within Groups	56.630	186	0.304		
Check grades	Between Groups	7.466	4	1.867	5.400	0.000**
	Within Groups	64.293	186	0.346		
Check announcements	Between Groups	13.604	4	3.401	10.742	0.000**
	Within Groups	58.888	186	0.317		

**p<0.01; * p < 0.05

Table 4.61: Descriptive statistics for students' opinions on the strengths of Blackboard E-Learn and students' school of study

Strengths	School of study	N	Mean	Std. Dev
One point of access	SCT	39	1.64	0.49
	SCAC	48	1.77	0.72
	SHTLM	40	1.60	0.50
	SUBS	39	1.69	0.47
	SHNS	25	1.92	0.70
Easy standardization of course materials	SCT	39	1.26	0.44
	SCAC	48	1.71	0.74
	SHTLM	40	1.38	0.49
	SUBS	39	1.46	0.51
	SHNS	25	1.56	0.82
Streamlined distribution and updating of lecture notes	SCT	39	1.38	0.49
	SCAC	48	1.77	0.72
	SHTLM	40	1.30	0.46
	SUBS	39	1.15	0.37
	SHNS	25	1.68	0.80

Table 4.62: ANOVA results for the students' opinions on the strengths of Blackboard E-Learn and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
One point of access	Between Groups	1.961	4	0.490	1.443	0.222
	Within Groups	63.201	186	0.340		
Easy standardization of course materials	Between Groups	5.064	4	1.266	3.434	0.010*
	Within Groups	68.580	186	0.369		
Streamlined distribution and updating of lecture notes	Between Groups	10.745	4	2.686	7.978	0.000**
	Within Groups	62.627	186	0.337		

**p<0.01; * p < 0.05

The results show that there was a significant difference between students' school of study and their opinion on the purposes of using Blackboard E-learn and its strengths. They agreed that Blackboard E-learn is a tool used to participate in discussion board and a one point of access to information. However, they had different opinion in the use of Blackboard E-learn to upload assignment, do self-enrolment to subject(s), check grades, check announcements as well as some of its strengths (i.e. easy standardization

of course materials and streamlined distribution and updating of lecture notes). Overall, students' school of study had some significant effects on the perception of students towards the use of Blackboard E-learn.

Search Engines

From the following statistics and ANOVA tables as shown in Tables 4.63 to 4.66, the p-values for all given purposes of using search engines were large i.e. 'do research' ($p = 0.935$) and 'finding solutions to problems' ($p = 0.067$, see Tables 4.63 and 4.64) indicating that there were not enough evidence to reject the null hypotheses ($p > 0.05$). Hence, there was no significant difference between the students' school of study and their opinions on these purposes of using search engines. This means that the all the students from different schools agreed with the of search engines in doing research and finding solutions to problems.

Furthermore, the results as shown in Tables 4.65 and 4.66 reveal that the p-values for one of the given strength of using search engines namely 'wide variety of information' was < 0.01 indicating that there was strong evidence to reject the null hypotheses ($p = 0.000$, see Tables 4.65 and 4.66). Hence, students at different school of study had different opinion on the strength of using search engines given in the study.

Besides, the results also show that the p-value for one of the given strengths of search engines, i.e. 'able to perform keyword research' ($p = 0.040$)

was < 0.05 indicating two different interpretations (see Tables 4.65 and 4.66). If the significance level is set at 0.01, the null hypotheses could not be rejected as p > 0.01. However, when tested at a 0.05 significance level, the null hypotheses would have been rejected (p > 0.05). Hence, there was a significant difference between students' opinion on this strength of search engines at a 0.05 significance level.

However, the p-value for the rest of the given strengths of search engines were rather large i.e. 'provide quality information' (p = 0.123), 'faster way in researching things' (p = 0.314) and 'easier way in researching things' (p = 0.202) indicating that there were not enough evidence to reject the null hypothesis (p > 0.05). Thus, students in all schools were in agreement on all the three strengths of search engines given in the study.

Table 4.63: Descriptive statistics for the purposes of using Search Engines and students' school of study

Purposes	School of study	N	Mean	Std. Dev
Do research	SCT	39	1.05	0.22
	SCAC	48	1.08	0.28
	SHTLM	40	1.08	0.27
	SUBS	39	1.05	0.22
	SHNS	25	1.04	0.20
Finding solutions to problems	SCT	39	1.08	0.27
	SCAC	48	1.29	0.46
	SHTLM	40	1.25	0.44
	SUBS	39	1.28	0.46
	SHNS	25	1.12	0.33

Table 4.64: ANOVA results for the purposes of using Search Engines and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Do research	Between Groups	0.050	4	0.012	0.206	0.935
	Within Groups	11.197	186	0.060		
Finding solutions to problems	Between Groups	1.476	4	0.369	2.233	0.067
	Within Groups	30.723	186	0.165		

The overall results show that all the schools were in agreement on all the purposes and strengths of search engines given in the study except for the opinion on the strengths of 'wide variety of information' and 'able to perform keyword research'. Students in all five schools felt that search engines are useful for providing wide variety of information and are able to perform keyword research.

Table 4.65: Descriptive statistics for students' opinions on the strengths of Search Engines and students' school of study

Strengths	School of study	N	Mean	Std. Dev
Able to perform keyword research	SCT	39	1.21	0.41
	SCAC	48	1.46	0.50
	SHTLM	40	1.23	0.42
	SUBS	39	1.38	0.49
	SHNS	25	1.44	0.51
Provide quality information	SCT	39	1.59	0.50
	SCAC	48	1.38	0.49
	SHTLM	40	1.35	0.48
	SUBS	39	1.54	0.51
	SHNS	25	1.52	0.51
Wide variety of information	SCT	39	1.31	0.47
	SCAC	48	1.46	0.50
	SHTLM	40	1.05	0.22
	SUBS	39	1.21	0.41
	SHNS	25	1.12	0.33
Faster way in researching things	SCT	39	1.23	0.43
	SCAC	48	1.17	0.38
	SHTLM	40	1.25	0.44
	SUBS	39	1.33	0.48
	SHNS	25	1.36	0.49
Easier way in researching things	SCT	39	1.36	0.49
	SCAC	48	1.23	0.43
	SHTLM	40	1.12	0.34

	SUBS	39	1.26	0.44
	SHNS	25	1.24	0.44

Table 4.66: ANOVA results for the students' opinions on the strengths of Search Engines and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Able to perform keyword research	Between Groups	2.238	4	0.560	2.561	0.040*
	Within Groups	40.641	186	0.219		
Provide quality information	Between Groups	1.811	4	0.453	1.842	0.123
	Within Groups	45.718	186	0.246		
Wide variety of information	Between Groups	4.311	4	1.078	6.441	0.000**
	Within Groups	31.123	186	0.167		
Faster way in researching things	Between Groups	0.913	4	0.228	1.195	0.314
	Within Groups	35.516	186	0.191		
Easier way in researching things	Between Groups	1.097	4	0.274	1.508	0.202
	Within Groups	33.824	186	0.182		

**p<0.01; * p < 0.05

Instant Messaging

From the following statistics and ANOVA tables as shown in tables 4.67 to 4.70, the p-values for all the given purposes of using instant messaging namely 'discuss assignments' (p = 0.003) and 'participate in chat rooms' (p = 0.001) were < 0.01 indicating that there were strong evidence to reject the null hypotheses (see Tables 4.67. and 4.68). Hence, students from different schools had different opinions on these two purposes of using instant.

However, the p-value for a given purpose of using instant messaging namely 'chat with lecturers and friends' (p = 0.048) was < 0.05 indicating that there was enough evidence to reject the null hypotheses (see Tables 4.67 and 4.68). Hence, students from different schools of study had different opinions on this purpose of using instant messaging (i.e. chat with lecturers and friends').

Furthermore, the results in Tables 4.67 and 4.68 also reveal that the p-values for two of the given purposes of using instant messaging were large i.e. ‘upload files’ ($p = 0.687$) and ‘send files’ ($p = 0.214$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, students from all schools could be in agreement on these two strengths of email (i.e. ‘upload files’ and ‘send files’).

Besides, the results also show that the p-values for two of the given strengths of instant messaging i.e. ‘simple and fast’ ($p = 0.038$) and ‘cheap’ ($p = 0.022$) were < 0.05 indicating two different interpretations (see Tables 4.69 and 4.70). If the significance level is set at 0.01, the null hypotheses could not be rejected as $p > 0.01$. However, when tested at a 0.05 significance level, the null hypotheses would have been rejected ($p > 0.05$). Hence, there was a significant difference between students’ school of study and their opinions on these strengths of instant messaging (i.e. ‘simple and fast’ and ‘cheap’) at a 0.05 significance level. As for the strengths of ‘feasible communication’ ($p = 0.661$) and ’good platform for socialising’ ($p = 0.821$), the p-values were large indicating that there were not enough evidence to reject the null hypotheses ($p > 0.05$). Hence, students from different schools agreed that instant messaging provide an opportunity to communicate with each other and a good platform for socialising.

Table 4.67: Descriptive statistics for the purposes of using Instant Messaging and students' school of study

Purposes	School of study	N	Mean	Std. Dev
Chat with lecturers and friends	SCT	39	1.10	0.38
	SCAC	48	1.40	0.54
	SHTLM	40	1.23	0.42
	SUBS	39	1.23	0.43
	SHNS	25	1.32	0.48
Upload files	SCT	39	1.56	0.55
	SCAC	48	1.48	0.55
	SHTLM	40	1.57	0.50
	SUBS	39	1.64	0.49
	SHNS	25	1.60	0.50
Send files	SCT	39	1.44	0.55
	SCAC	48	1.29	0.50
	SHTLM	40	1.40	0.50
	SUBS	39	1.54	0.51
	SHNS	25	1.32	0.48
Discuss assignments	SCT	39	1.18	0.45
	SCAC	48	1.52	0.55
	SHTLM	40	1.30	0.47
	SUBS	39	1.44	0.50
	SHNS	25	1.16	0.38
Participate in chat rooms	SCT	39	1.59	0.55
	SCAC	48	1.65	0.53
	SHTLM	40	1.50	0.51
	SUBS	39	1.67	0.48
	SHNS	25	1.16	0.37

Table 4.68: ANOVA results for the purposes of using Instant Messaging and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Chat with lecturers and friends	Between Groups	2.022	4	0.506	2.448	0.048*
	Within Groups	38.407	186	0.206		
Upload files	Between Groups	0.614	4	0.153	0.567	0.687
	Within Groups	50.318	186	0.271		
Send files	Between Groups	1.520	4	0.380	1.466	0.214
	Within Groups	48.239	186	0.259		
Discuss assignments	Between Groups	3.807	4	0.952	4.110	0.003**
	Within Groups	43.073	186	0.232		
Participate in chat rooms	Between Groups	4.930	4	1.232	4.936	0.001**
	Within Groups	46.442	186	0.250		

**p<0.01; * p < 0.05

Table 4.69: Descriptive statistics for students' opinions on the strengths of Instant Messaging and students' school of study

Strengths	School of study	N	Mean	Std. Dev
Simple and fast	SCT	39	1.15	0.43
	SCAC	48	1.38	0.53
	SHTLM	40	1.15	0.36
	SUBS	39	1.13	0.34
	SHNS	25	1.28	0.46
Cheap	SCT	39	1.51	0.56
	SCAC	48	1.50	0.55
	SHTLM	40	1.20	0.41
	SUBS	39	1.41	0.50
	SHNS	25	1.28	0.46
Feasible communication	SCT	39	1.46	0.56
	SCAC	48	1.60	0.54
	SHTLM	40	1.45	0.50
	SUBS	39	1.51	0.51
	SHNS	25	1.52	0.51
Good platform for socialising	SCT	39	1.46	0.56
	SCAC	48	1.35	0.53
	SHTLM	40	1.47	0.51
	SUBS	39	1.44	0.50
	SHNS	25	1.40	0.50

Table 4.70: ANOVA results for the students' opinions on the strengths of Instant Messaging and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Simple and fast	Between Groups	1.939	4	0.485	2.588	0.038*
	Within Groups	34.826	186	0.187		
Cheap	Between Groups	2.930	4	0.733	2.923	0.022*
	Within Groups	46.619	186	0.251		
Feasible communication	Between Groups	0.662	4	0.166	0.603	0.661
	Within Groups	51.055	186	0.274		
Good platform for socialising	Between Groups	0.413	4	0.103	0.382	0.821
	Within Groups	50.236	186	0.270		

* $p < 0.05$

YouTube

From the following statistics and ANOVA tables as shown in tables 4.71 to 4.74, the p-value for a given purpose of using YouTube namely 'edit video clips' ($p = 0.009$) was < 0.01 indicating that there was strong evidence to

reject the null hypotheses (see Tables 4.71 and 4.72). Hence, students from different schools had different opinions on this purpose of using YouTube namely ‘edit video clips’.

Besides, the p-value for two of the given purposes of YouTube i.e. ‘post video clips’ ($p = 0.029$) and ‘video clips sharing’ ($p = 0.049$) were < 0.05 indicating two different interpretations (see Tables 4.71 and 4.72). If the significance level is set at 0.01, the null hypotheses could not be rejected as $p > 0.01$. However, when tested at a 0.05 significance level, the null hypotheses would have been rejected ($p > 0.05$). Hence, there was a significant difference students’ school of study and students’ opinions on these strengths of YouTube namely posting and sharing video clips at a 0.05 significance level.

As for the other given purpose of using YouTube, the p-value was large i.e. ‘download video clips’ ($p = 0.755$, see Tables 4.71 and 4.72) indicating that there was not enough evidence to reject the null hypotheses ($p > 0.05$). Hence, there was no significant difference between the students’ school of study and their opinions on this purpose of using YouTube. This means that all students were in agreement on the purpose of ‘download video clips’.

Furthermore, the results as shown in Tables 4.73 and 4.74 reveal that the p-value a given strength of YouTube i.e. ‘ability to broadcast to millions of viewers’ was < 0.05 ($p = 0.035$, see Tables 4.56 and 4.57) indicating two different interpretations. If the significance level is set at a 0.05 significance level, the null hypotheses would have been rejected ($p < 0.05$). However, when

tested at a 0.01 significance level, the null hypotheses could not be rejected as $p > 0.01$. Hence, there was no significant difference between students' school of study and their opinion on this strength of YouTube at a 0.01 significance level.

However, the results in Tables 4.73 and 4.74 also show that the p-values for four of the strengths of YouTube given in the study were large i.e. 'simple to use the website' ($p = 0.446$), 'availability of updated video clips' ($p = 0.437$), 'watch video with a click of a button' ($p = 0.174$) and 'users are able to control video clips" ($p = 0.767$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, students in all schools could be in agreement on these strengths of YouTube.

Therefore, students' school of study had some significant effects on the perception of students towards the use of YouTube. The results show that there was a significant difference between students' school of study and their opinions on some purposes of using instant messaging and its strengths. They agreed that YouTube is a tool used to download video clips. They were also in agreement on the given strengths of the instant messaging such as 'simple to use the website', 'availability of updated video clips',' watch video with a click of a button' and 'users are able to control video clips'. However, they had different opinions on the use of YouTube to post video clips, video clips sharing and edit video clips as well as some of its strengths (i.e. ability to broadcast to millions of viewers).

Table 4.71: Descriptive statistics for the purposes of using YouTube and students' school of study

Purposes	School of study	N	Mean	Std. Dev
Post video clips	SCT	39	1.72	0.46
	SCAC	48	1.65	0.48
	SHTLM	40	1.70	0.46
	SUBS	39	1.90	0.31
	SHNS	25	2.00	0.00
Download video clips	SCT	39	1.23	0.43
	SCAC	48	1.52	0.51
	SHTLM	40	1.25	0.44
	SUBS	39	1.38	0.49
	SHNS	25	1.40	0.50
	SCT	39	1.46	0.51
	SCAC	48	1.48	0.51
Video clips sharing	SHTLM	40	1.67	0.47
	SUBS	39	1.44	0.50
	SHNS	25	1.68	0.48
Edit video clips	SCT	39	1.85	0.37
	SCAC	48	1.92	0.28
	SHTLM	40	1.80	0.41
	SUBS	39	1.95	0.22
	SHNS	25	1.96	0.20

Table 4.72: ANOVA results for the purposes of using YouTube and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Post video clips	Between Groups	0.843	4	0.843	4.828	0.029*
	Within Groups	33.020	186	0.175		
Download video clips	Between Groups	0.023	4	0.023	0.098	0.755
	Within Groups	44.051	186	0.233		
Video clips sharing	Between Groups	0.969	4	0.969	3.933	0.049*
	Within Groups	46.560	186	0.246		
Edit video clips	Between Groups	0.672	4	0.672	7.051	0.009**
	Within Groups	18.019	186	0.095		

**p<0.01;* p < 0.05

Table 4.73: Descriptive statistics for students' opinions on the strengths of YouTube and students' school of study

Strengths	School of study	N	Mean	Std. Dev
Simple to use the website	SCT	39	1.23	0.43
	SCAC	48	1.42	0.50
	SHTLM	40	1.23	0.42
	SUBS	39	1.38	0.49
	SHNS	25	1.52	0.51
Availability of updated	SCT	39	1.44	0.50

video clips	SCAC	48	1.58	0.50
	SHTLM	40	1.30	0.46
	SUBS	39	1.41	0.50
	SHNS	25	1.60	0.50
Watch video with a click of a button	SCT	39	1.05	0.22
	SCAC	48	1.42	0.50
	SHTLM	40	1.13	0.34
	SUBS	39	1.10	0.31
	SHNS	25	1.32	0.48
Ability to broadcast to millions of viewers	SCT	39	1.38	0.49
	SCAC	48	1.50	0.51
	SHTLM	40	1.38	0.49
	SUBS	39	1.49	0.51
	SHNS	25	1.76	0.44
Users are able to control video clips	SCT	39	1.72	0.46
	SCAC	48	1.67	0.48
	SHTLM	40	1.70	0.46
	SUBS	39	1.74	0.44
	SHNS	25	1.76	0.44

Table 4.74: ANOVA results for the students' opinions on the strengths of YouTube and students' school of study

ANOVA Table		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Simple to use the website	Between Groups	0.133	4	0.133	0.583	0.446
	Within Groups	43.061	186	0.228		
Availability of updated video clips	Between Groups	0.152	4	0.152	0.606	0.437
	Within Groups	47.304	186	0.250		
Watch video with a click of a button	Between Groups	0.303	4	0.303	1.866	0.174
	Within Groups	30.733	186	0.163		
Ability to broadcast to millions of viewers	Between Groups	1.109	4	1.109	4.502	0.035*
	Within Groups	46.576	186	0.246		
Users are able to control video clips	Between Groups	0.018	4	0.018	0.088	0.767
	Within Groups	39.144	186	0.207		

* $p < 0.05$

Ms PowerPoint

From the following statistics and ANOVA tables as shown in tables 4.75 to 4.78, the p-value for a purpose of using Ms PowerPoint was < 0.05 i.e. 'view slides' ($p = 0.025$, see Tables 4.75 and 4.76) indicating two different interpretations. If the significance level is set at a 0.01 significance level, the

null hypotheses could not be rejected ($p > 0.01$). However, when tested at a 0.05 significance level, the null hypotheses would have been rejected as $p < 0.05$. Hence, there was a significant difference between students' opinion on this purpose of using Ms PowerPoint at a 0.05 significance level.

For the remaining given purposes of using Ms PowerPoint, the p-values were large namely 'create slides' ($p = 0.659$), 'edit slides' ($p = 0.266$) and 'publish slides in web browser' ($p = 0.924$) (see Tables 4.75 and 4.76) indicating that there were not enough evidence to reject the null hypotheses ($p > 0.05$). Hence, there was no significant difference between the students' school of study and their opinions on these purposes of using Ms PowerPoint. This means that all the students were in agreement on the purposes of using the Ms. PowerPoint to create slides, edit slides and publish slides in web browser.

Furthermore, the results as shown in Tables 4.77 and 4.78 reveal that p-values for all the given strengths of Ms PowerPoint were rather large i.e. 'increase motivation' ($p = 0.528$), 'benefits over basic presentations' ($p = 0.700$), 'aid retention' ($p = 0.075$), and 'better design compared to Overhead Projection (OHP) slides' ($p = 0.110$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, students in all school of study could be in agreement on these strengths of Ms PowerPoint.

Therefore, students' school of study had some significant effects on the perception of students towards the use of Ms PowerPoint. They agreed that Ms PowerPoint is a tool use to create slides, edit slides and publish slides in web

browser. They were also in agreement on all the given strengths of Ms PowerPoint such as 'increase motivation', 'benefits over basic presentations', aid retention' and 'better design compared to Overhead Projection (OHP) slides'. However, students in all the schools had different opinion on the purpose of using Ms PowerPoint to view slides.

Table 4.75: Descriptive statistics for the purposes of using Ms PowerPoint and students' school of study

Purposes	School of study	N	Mean	Std. Dev
Create slides	SCT	39	1.15	0.37
	SCAC	48	1.27	0.54
	SHTLM	40	1.18	0.50
	SUBS	39	1.23	0.49
	SHNS	25	1.12	0.44
Edit slides	SCT	39	1.31	0.47
	SCAC	48	1.44	0.58
	SHTLM	40	1.25	0.54
	SUBS	39	1.41	0.55
	SHNS	25	1.20	0.50
Publish slides in web browser	SCT	39	1.74	0.44
	SCAC	48	1.79	0.50
	SHTLM	40	1.80	0.52
	SUBS	39	1.74	0.50
	SHNS	25	1.84	0.47
View slides	SCT	39	1.08	0.27
	SCAC	48	1.44	0.58
	SHTLM	40	1.28	0.55
	SUBS	39	1.23	0.49
	SHNS	25	1.28	0.54

Table 4.76: ANOVA results for the purposes of using Ms PowerPoint and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Create slides	Between Groups	0.546	4	0.136	0.606	0.659
	Within Groups	41.894	186	0.225		
Edit slides	Between Groups	1.499	4	0.375	1.314	0.266
	Within Groups	53.056	186	0.285		
Publish slides in web browser	Between Groups	0.216	4	0.054	0.225	0.924
	Within Groups	44.548	186	0.240		
View slides	Between Groups	2.862	4	0.716	2.861	0.025*
	Within Groups	46.520	186	0.250		

* $p < 0.05$

Table 4.77: Descriptive statistics for students' opinions on the strengths of Ms PowerPoint and students' school of study

Strengths	School of study	N	Mean	Std. Dev
Increase motivation	SCT	39	1.64	0.49
	SCAC	48	1.65	0.57
	SHTLM	40	1.75	0.54
	SUBS	39	1.72	0.51
	SHNS	25	1.84	0.47
Benefits over basic	SCT	39	1.08	0.27
presentations	SCAC	48	1.21	0.50
	SHTLM	40	1.15	0.48
	SUBS	39	1.18	0.45
	SHNS	25	1.12	0.44
Aid retention	SCT	39	1.54	0.51
	SCAC	48	1.77	0.52
	SHTLM	40	1.47	0.60
	SUBS	39	1.49	0.56
	SHNS	25	1.60	0.58
Better design compared to	SCT	39	1.54	0.51
Overhead Projection slides	SCAC	48	1.33	0.56
	SHTLM	40	1.57	0.59
	SUBS	39	1.59	0.55
	SHNS	25	1.36	0.57

Table 4.78: ANOVA results for the students' opinions on the strengths of Ms PowerPoint and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Increase motivation	Between Groups	0.870	4	0.218	0.798	0.528
	Within Groups	50.711	186	0.273		
Benefits over basic	Between Groups	0.427	4	0.107	0.549	0.700
presentations	Within Groups	36.169	186	0.194		
Aid retention	Between Groups	2.602	4	0.651	2.165	0.075
	Within Groups	55.890	186	0.300		
Better design compared to	Between Groups	2.356	4	0.589	1.911	0.110
Overhead Projection (OHP) slides	Within Groups	57.330	186	0.308		

Facebook

From the following statistics and ANOVA tables as shown in tables 4.79 to 4.82, the p-value one given purpose was < 0.05 i.e. 'chat with lecturers and classmates' (p = 0.026) indicating two different interpretations (see Tables 4.79 and 4.80). If the significance level is set at a 0.01 significance level, the null hypotheses could not be rejected (p > 0.01). However, when tested at a 0.05 significance level, the null hypotheses would have been rejected as p < 0.05. Hence, there was a significant difference between students' opinion on the purpose of using Facebook to chat with lecturers and classmates at a 0.05 significance level.

As for the other four of the given purposes of using Facebook, the p-values were large i.e. 'upload documents/photos/videos' (p = 0.854), 'post comments' (p = 0.778), 'create group' (p= 0.327) and 'create ads (advertising purposes)' (p = 0.749) (see Tables 4.79 and 4.80) indicating that there were not enough evidence to reject the null hypotheses (p > 0.05). Hence, there was no significant difference between the students' school of study and their opinions on these purposes of using Facebook. This means that students in all schools agreed that Facebook can be used to upload documents/photos/videos, post comments, create and create advertisements.

Furthermore, the results as shown in Tables 4.81 and 4.82 reveal that one of the strength of 'updated news' (p = 0.004) was < 0.01 indicating that there was strong evidence to reject the null hypotheses (see Tables 4.81 and

4.82). Hence, students at different school of study had different opinion on the strength of using search engines given in the study.

Besides, the p-values for the rest of the strengths of Facebook were large i.e. ‘connected to people’ ($p = 0.350$), ‘global exposure’ ($p = 0.114$), ‘free advertising’ ($p = 0.308$), ‘more personal connection’ ($p = 0.575$) and ‘making friends with similar interests’ ($p = 0.381$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$). Thus, students in all schools could be in agreement on these strengths of Facebook.

The results show that regardless of the school of study, all students agreed that Facebook is used to accomplish general tasks such as upload documents, photos, videos, post comments, create group and create advertisements. They were also in agreement on some of the given strengths of the Facebook such as connected to people, global exposure, free advertising, more personal connection and making friends with similar interests. However, they possessed different opinions on the purpose of using the Facebook to chat with lecturers and classmates as well as the strength of ‘updated news’.

Overall, it can be concluded students’ school of study had some significant effects on their perception towards the use of Facebook depends on its usage and strengths.

Table 4.79: Descriptive statistics for the purposes of using Facebook and students' school of study

Purposes	School of study	N	Mean	Std. Dev
Upload documents, photos, videos	SCT	39	1.08	0.35
	SCAC	48	1.10	0.37
	SHTLM	40	1.15	0.36
	SUBS	39	1.10	0.31
	SHNS	25	1.16	0.37
Post comments	SCT	39	1.08	0.27
	SCAC	48	1.10	0.37
	SHTLM	40	1.03	0.16
	SUBS	39	1.08	0.27
	SHNS	25	1.08	0.28
Chat with lecturers and classmates	SCT	39	1.13	0.34
	SCAC	48	1.31	0.51
	SHTLM	40	1.08	0.27
	SUBS	39	1.15	0.37
	SHNS	25	1.08	0.28
Create group	SCT	39	1.38	0.49
	SCAC	48	1.52	0.55
	SHTLM	40	1.33	0.47
	SUBS	39	1.49	0.51
	SHNS	25	1.52	0.51
Create ads (advertising purposes)	SCT	39	1.79	0.41
	SCAC	48	1.73	0.49
	SHTLM	40	1.70	0.46
	SUBS	39	1.74	0.44
	SHNS	25	1.64	0.49

Table 4.80: ANOVA results for the purposes of using Facebook and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Upload documents, photos, videos	Between Groups	0.168	4	0.042	0.335	0.854
	Within Groups	23.298	186	0.125		
Post comments	Between Groups	0.141	4	0.035	0.443	0.778
	Within Groups	14.833	186	0.080		
Chat with lecturers and classmates	Between Groups	1.605	4	0.401	2.831	0.026*
	Within Groups	26.363	186	0.142		
Create group	Between Groups	1.204	4	0.301	1.167	0.327
	Within Groups	47.969	186	0.258		
Create ads (advertising purposes)	Between Groups	0.409	4	0.102	0.482	0.749
	Within Groups	39.434	186	0.212		

* $p < 0.05$

Table 4.81: Descriptive statistics for students' opinions on the strengths of Facebook and students' school of study

Strengths	School of study	N	Mean	Std. Dev
Connected to people	SCT	39	1.03	0.16
	SCAC	48	1.10	0.37
	SHTLM	40	1.05	0.22
	SUBS	39	1.03	0.16
	SHNS	25	1.00	0.00
Updated news	SCT	39	1.15	0.37
	SCAC	48	1.33	0.52
	SHTLM	40	1.05	0.22
	SUBS	39	1.21	0.41
	SHNS	25	1.04	0.20
Global exposure	SCT	39	1.26	0.44
	SCAC	48	1.23	0.47
	SHTLM	40	1.23	0.42
	SUBS	39	1.46	0.51
	SHNS	25	1.24	0.44
Free advertising	SCT	39	1.44	0.50
	SCAC	48	1.48	0.55
	SHTLM	40	1.38	0.49
	SUBS	39	1.62	0.49
	SHNS	25	1.44	0.51
More personal connection	SCT	39	1.33	0.48
	SCAC	48	1.21	0.46
	SHTLM	40	1.28	0.45
	SUBS	39	1.26	0.44
	SHNS	25	1.16	0.37
Making friends with similar interests	SCT	39	1.31	0.47
	SCAC	48	1.33	0.52
	SHTLM	40	1.38	0.49
	SUBS	39	1.46	0.51
	SHNS	25	1.52	0.51

Table 4.82: ANOVA results for the students' opinions on the strengths of Facebook and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Connected to people	Between Groups	0.248	4	0.062	1.117	0.350
	Within Groups	10.328	186	0.056		
Updated news	Between Groups	2.336	4	0.584	4.028	0.004**
	Within Groups	26.963	186	0.145		
Global exposure	Between Groups	1.591	4	0.398	1.890	0.114
	Within Groups	39.142	186	0.210		
Free advertising	Between Groups	1.257	4	0.314	1.209	0.308
	Within Groups	48.335	186	0.260		
More personal connection	Between Groups	0.583	4	0.146	0.726	0.575
	Within Groups	37.354	186	0.201		
Making friends with similar interests	Between Groups	1.048	4	0.262	1.053	0.381
	Within Groups	46.282	186	0.249		

**$p < 0.01$

Email

From the following statistics and ANOVA tables as shown in Tables 4.83 to 4.86, the p-values for all the given purposes of using email were large namely ‘send messages’ ($p = 0.965$), ‘receive messages’ ($p = 0.884$), ‘chat with lecturers and friends’ ($p = 0.099$), ‘attach files’ ($p = 0.547$), ‘organise events using calendar’ ($p = 0.323$), and ‘organise tasks to do’ ($p = 0.123$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$) (see Tables 4.83 and 4.84). Hence, students’ at all five schools were in agreement on all the given purposes of using the email in the study.

Besides, the results as shown in Tables 4.85 and 4.86 reveal that the p-value for a given strength i.e. ‘access to information’ ($p= 0.036$) was < 0.05 indicating two different interpretations (see Tables 4.85 and 4.86). If the significance level is set at a 0.05 significance level, the null hypotheses would have been rejected ($p < 0.05$). However, when tested at a 0.01 significance level, the null hypotheses could not be rejected as $p > 0.01$. Hence, there was no significant difference between all students’ opinion on this strength of email at a 0.05 significance level for all the schools.

Besides, for the rest of the given strengths of email, the p-values were large i.e. ‘sharing of productive ideas’ ($p = 0.912$), ‘archiving of information’ ($p = 0.510$), ‘better collaboration’ ($p = 0.096$), ‘reduce physical meetings’ ($p = 0.070$), and ‘can check email anywhere and anytime’ ($p = 0.149$) indicating that there were not enough evidence to reject the null hypothesis ($p > 0.05$).

Thus, students in all schools could be in agreement on all the strengths of email given in the study.

Table 4.83: Descriptive statistics for the purposes of using Email and students' school of study

Purposes	School of study	N	Mean	Std. Dev
Send messages	SCT	39	1.05	0.32
	SCAC	48	1.04	0.20
	SHTLM	40	1.08	0.35
	SUBS	39	1.08	0.27
	SHNS	25	1.08	0.28
Receive messages	SCT	39	1.05	0.32
	SCAC	48	1.04	0.20
	SHTLM	40	1.10	0.38
	SUBS	39	1.05	0.22
	SHNS	25	1.08	0.28
Chat with lecturers and friends	SCT	39	1.46	0.56
	SCAC	48	1.48	0.51
	SHTLM	40	1.67	0.53
	SUBS	39	1.49	0.51
	SHNS	25	1.32	0.48
Attach files	SCT	39	1.08	0.35
	SCAC	48	1.08	0.28
	SHTLM	40	1.13	0.40
	SUBS	39	1.13	0.34
	SHNS	25	1.00	0.00
Organise events using calendar	SCT	39	1.77	0.49
	SCAC	48	1.92	0.28
	SHTLM	40	1.75	0.49
	SUBS	39	1.85	0.37
	SHNS	25	1.84	0.37
Organise tasks to do	SCT	39	1.79	0.47
	SCAC	48	1.79	0.41
	SHTLM	40	1.60	0.55
	SUBS	39	1.77	0.43
	SHNS	25	1.88	0.33

Table 4.84: ANOVA results for the purposes of using Email and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Send messages	Between Groups	0.048	4	0.012	0.146	0.965
	Within Groups	15.198	186	0.082		
Receive messages	Between Groups	0.095	4	0.024	0.290	0.884
	Within Groups	15.152	186	0.081		
Chat with lecturers and friends	Between Groups	2.119	4	0.530	1.985	0.099
	Within Groups	49.630	186	0.267		
Attach files	Between Groups	0.317	4	0.079	0.769	0.547
	Within Groups	19.170	186	0.103		
Organise events using calendar	Between Groups	0.772	4	0.193	1.176	0.323
	Within Groups	30.527	186	0.164		
Organise task to do	Between Groups	1.483	4	0.371	1.842	0.123
	Within Groups	37.439	186	0.201		

Table 4.85: Descriptive statistics for students' opinions on the strengths of Email and students' school of study

Strengths	School of study	N	Mean	Std. Dev
Sharing of productive ideas	SCT	39	1.49	0.56
	SCAC	48	1.40	0.49
	SHTLM	40	1.48	0.55
	SUBS	39	1.49	0.51
	SHNS	25	1.44	0.51
Archiving of information	SCT	39	1.46	0.56
	SCAC	48	1.40	0.49
	SHTLM	40	1.47	0.55
	SUBS	39	1.54	0.51
	SHNS	25	1.32	0.48
Access to information	SCT	39	1.26	0.50
	SCAC	48	1.44	0.50
	SHTLM	40	1.43	0.55
	SUBS	39	1.21	0.41
	SHNS	25	1.16	0.37
Better collaboration	SCT	39	1.64	0.54
	SCAC	48	1.50	0.51
	SHTLM	40	1.40	0.55
	SUBS	39	1.67	0.48
	SHNS	25	1.44	0.51
Reduce physical meetings	SCT	39	1.36	0.54
	SCAC	48	1.44	0.50
	SHTLM	40	1.48	0.55
	SUBS	39	1.56	0.50
	SHNS	25	1.20	0.41
Can check email anywhere and anytime	SCT	39	1.36	0.54
	SCAC	48	1.21	0.41
	SHTLM	40	1.38	0.54
	SUBS	39	1.31	0.47
	SHNS	25	1.12	0.33

Table 4.86: ANOVA results for the students' opinions on the strengths of Email and students' school of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
Sharing of productive ideas	Between Groups	0.270	4	0.068	0.246	0.912
	Within Groups	51.101	186	0.275		
Archiving of information	Between Groups	0.894	4	0.223	0.827	0.510
	Within Groups	50.279	186	0.270		
Access to information	Between Groups	2.409	4	0.602	2.621	0.036*
	Within Groups	42.742	186	0.230		
Better collaboration	Between Groups	2.128	4	0.532	2.003	0.096
	Within Groups	49.401	186	0.266		
Reduce physical meetings	Between Groups	2.298	4	0.574	2.210	0.070
	Within Groups	48.352	186	0.260		
Can check email anywhere and anytime	Between Groups	1.519	4	0.380	1.714	0.149
	Within Groups	41.214	186	0.222		

* $p < 0.05$

Summary of H1c Testing

From the above data analysis a decision can be made toward accepting or rejecting the research null hypothesis as follows:

$H_0$1c: Students' school of study does not have any significant effects on their perception towards the use of e-learning tools.

Table 4.87 shows the hypotheses for each learning tool and decision of acceptance or rejection for each tool. Based on the summary shown in Table 4.87, the decision of acceptance or rejection for the entire research null hypothesis ($H_0$1c) was made.

Table 4.87: Summary of research hypothesis (H1c) findings and the decisions

E-learning tool	Null Hypothesis	Decision
Blackboard E-learn	Students' school of study does not have any significant effects on their perception towards the use of Blackboard E-learn.	Partially rejected null hypothesis at a 0.05 significance level.
Search engines	Students' school of study does not have any significant effects on their perception towards the use of search engines.	Partially rejected null hypothesis a 0.05 significance level.
Instant messaging	Students' school of study does have any significant effects on their perception towards the use of instant messaging.	Partially rejected null hypothesis a 0.05 significance level.
YouTube	Students' school of study does not have any significant effects on their perception towards the use of YouTube.	Partially rejected null hypothesis at a 0.05 significance level.
Ms PowerPoint	Students' school of study does not have any significant effects on their perception towards the use of Ms PowerPoint.	Partially rejected null hypothesis a 0.05 significance level.
Facebook	Students' school of study does not have any significant effects on their perception towards the use of Facebook.	Partially rejected null hypothesis a 0.05 significance level.
Email	Students' school of study does not have any significant effects on their perception towards the use email.	Partially rejected null hypothesis a 0.05 significance level.

The results show that that there were significant differences among means found in five of the given e-learning tool in which the p-values for some of the purposes of using the tool and its strengths were < 0.01. These e-learning tools include Blackboard (i.e. the purposes of ‘‘upload assignment’, self-

enrolment to subjects', 'check grades' and 'check announcements' as well as the strength of 'streamlined distribution and updating lecture notes'), search engines (i.e. the strength of 'wide variety of information'), instant messaging (i.e. the purposes of 'discuss assignments' and participate in chat rooms'), YouTube (i.e. the purpose of 'edit video clips') and Facebook (i.e. the strength of 'updated news').

In addition, the results also indicate the students' school of study had some significant effects on their perception towards the use of all the e-learning tools given in the study in which the p-values were < 0.05. The findings are summarised as follows:

- **Blackboard E-learn:** p-values for a purpose of 'download course materials' and the strengths of 'easy standardization of course materials' were < 0.05 (see Tables 4.59 to 4.62),
- **Search engines:** p-value for the strengths of 'able to perform keyword research' was < 0.05 (see Tables 4.63 to 4.66),
- **Instant messaging:** p-values for the purposes of 'chat with lecturers and friends and the strengths of 'simple and fast' and 'cheap' were < 0.05 (see Tables 4.67 to 4.70),
- **YouTube:** p-values for the purposes of 'post video clips' and 'video clips sharing' as well as the strength of 'ability to broadcast to millions of viewers' were < 0.05 (see Tables 4.71 to 4.74),
- **Ms PowerPoint:** p-value for the purpose of 'view slides' was < 0.05 (see Tables 4.75 to 4.78),

- **Facebook:** p-value for the purpose of 'chat with lecturers and classmates' was < 0.05 (see Tables 4.79 to 4.82) and
- **Email:** p-value for the strength of 'access to information' was < 0.05 (see Tables 4.83 to 4.86).

Based on the summary results in Table 4.87, the null hypothesis for majority of the purposes of using Blackboard E-Learn and its strengths could be rejected at a 0.01 significance level. This indicates that students from different schools had different perceptions toward the use of Blackboard E-Learn in Sunway University compared to other types of e-learning tools in the study such as search engine, instant messaging, YouTube, Ms PowerPoint, Facebook and email.

Based on data collected, School of Health & Natural Sciences with major in nursing tends to discard Blackboard E-learn for their course. This is likely that this major is more practical-oriented and do not necessary need Blackboard E-learn for their practical notes. According to a student who is taking nursing course, she said that the course materials are given by the instructors. In the nursing department, the lecturers are called instructors because they are qualified professional nurses. Another major that does not use Blackboard E-learn for their course is performing arts which are from School of Creative Arts & Communication. Students said that the course materials were given to them by their lecturers. Most of the time, they spent a lot in the studio to practise on their acting skills.

Based on the results as shown in Table 4.87, it can be concluded that the entire research null hypothesis ($H_0$1c) could only be partially rejected. There was significant difference among means found in most of the purposes of using the given e-learning tools and their strengths. Overall, it can be concluded that the students' school of study had some significant effects on the perception of students towards the use of e-learning tools.

4.2.3.2 Testing H2

The following null hypothesis was tested:

$H_0$2: Four factors in the McCombs's learner-centred framework for e-learning do not have any significant relationship with the use of e-learning tools among university students.

This section presents the results on H2 testing that examined whether there was enough evidence to reject the null hypothesis. The reject of null hypothesis explains that four factors in the McCombs's learner-centred framework for e-learning have a significant relationship with the use of e-learning tools among university students. In the context of this study, the correlation analysis was used to explore the strength of the relationship between independent variables (four factors in the McCombs's learner-centred framework) and frequency use of each e-learning tool. The values of the coefficient range from −1 (negative association, or perfect inversion) to +1 (positive association, or perfect agreement). A value of zero indicates the absence of association. Each e-learning tool consisted of respective frequency

of use namely ‘Everyday’, ‘Once a week’, ‘Few times a week’, ‘Occasionally’ and ‘Never’.

The subsequent sections present the results of the H2 testing.

The subsequent sections present the results of the H2 testing. The Pearson correlation analysis was used to analyse $H_0$2 which was divided into the following sub- null hypotheses for further analysis:

$H_0$2a: Cognitive and meta-cognitive factors do not have any significant relationship with the use of e-learning tools among university students.

$H_0$2b: Motivational and affective factors do not have any significant relationship with the use of e-learning tools among university students.

$H_0$2c: Development and social factors do not have any significant relationship with the use of e-learning tools among university students.

$H_0$2d: Individual-difference factors do not have any significant relationship with the use of e-learning tools among university students.

a. Cognitive and Meta-Cognitive Factors and the frequency use of e-learning tools

Based on the results for cognitive and meta-cognitive factors as shown in tables 4.88 to 4.91, the frequency use of Blackboard E-learn (see Table 4.88), search engines (see Table 4.89) and Ms PowerPoint (see Table 4.92) show a significant relationship with cognitive and meta-cognitive factors.

For the relationship between cognitive and meta-cognitive factors and the frequency use of Blackboard E-learn, the p-value was found to be significant ($r = -0.184$, $p < 0.05$) (see Table 4.88). Therefore there was enough evidence to reject the null hypothesis. The cognitive and meta-cognitive factors were negatively correlated with the frequency use of Blackboard E-learn ($r = -0.184$).

As for the relationship between cognitive and meta-cognitive factors and the frequency use of search engines, the p-value was found to be highly significant ($r = 0.254$, $p < 0.01$) (see Table 4.89). Therefore there was strong evidence to reject the null hypothesis. The cognitive and meta-cognitive factors were positively correlated with the frequency use of Search Engines ($r = 0.254$).

Then for the relationship between cognitive and meta-cognitive factors and the frequency use of PowerPoint, the p-value was found to be significant ($r = -0.153$, $p < 0.05$) (see Table 4.92). Therefore there was enough evidence to

reject the null hypothesis. The cognitive and meta-cognitive factors were negatively correlated with the frequency use of Ms PowerPoint (r = -0.153).

As for the other four e-learning tools which are Instant Messaging (see Table 4.90), YouTube (see Table 4.91), Facebook (see Table 4.93) and email (see Table 4.94), which do not have a significant relationship between the cognitive factors and these e-learning tools. This could indicate that these e-learning tools are not as academic-oriented compared to Blackboard E-Learn, Search Engines and Ms PowerPoint which do not require a high level of thinking to use and more to entertainment.

Table 4.88: Pearson correlation results for Cognitive and Meta- Cognitive Factors and frequency use of Blackboard E-Learn

Domain factors		**Blackboard E-Learn**
Cognitive and Meta-Cognitive Factors	Pearson Correlation	-0.184*
	Sig. (2-tailed)	0.011
	N	191

* .Correlation is significant at the 0.05 level (2-tailed)

Table 4.89: Pearson correlation results for Cognitive and Meta- Cognitive Factors and frequency use of Search Engines

Domain factors		**Search Engine**
Cognitive and Meta-Cognitive Factors	Pearson Correlation	0.254**
	Sig. (2-tailed)	0.000
	N	191

**. Correlation is significant at the 0.01 level (2-tailed)

Table 4.90: Pearson correlation results for Cognitive and Meta-Cognitive Factors and frequency use of Instant Messaging

Domain factors		Instant Messaging
Cognitive and Meta-Cognitive Factors	Pearson Correlation	0.017
	Sig. (2-tailed)	0.815
	N	191

Table 4.91: Pearson correlation results for Cognitive and Meta-Cognitive Factors and frequency use of YouTube frequency

Domain factors		YouTube
Cognitive and Meta-Cognitive Factors	Pearson Correlation	0.057
	Sig. (2-tailed)	0.431
	N	191

Table 4.92: Pearson correlation results for Cognitive and Meta-Cognitive Factors and frequency use of Ms PowerPoint

Domain factors		Ms PowerPoint
Cognitive and Meta-Cognitive Factors	Pearson Correlation	-0.153*
	Sig. (2-tailed)	0.034
	N	191

*. Correlation is significant at the 0.05 level (2-tailed)

Table 4.93: Pearson correlation results for Cognitive and Meta-Cognitive Factors and frequency use of Facebook

Domain factors		Facebook
Cognitive and Meta-Cognitive Factors	Pearson Correlation	-0.138
	Sig. (2-tailed)	0.057
	N	191

Table 4.94: Pearson correlation results for Cognitive and Meta- Cognitive Factors and frequency use of Email

Domain factors		Email
Cognitive and Meta-Cognitive Factors	Pearson Correlation	-0.072
	Sig. (2-tailed)	0.325
	N	191

Summary of H2a Testing

From the above data analysis a decision can be made toward accepting or rejecting the research null hypothesis as follows:

$H_0$2a: Cognitive and meta-cognitive factors do not have any significant relationship with the use of e-learning tools among university students.

Table 4.95 shows the hypotheses for each learning tool and decision of acceptance or rejection for each tool. Based on the summary shown in Table 4.95, the decision of acceptance or rejection for the entire research null hypothesis ($H_0$2a) was made.

Table 4.95: Summary of research hypothesis (H2a) findings on cognitive and meta-cognitive factors and the decisions

E-learning tool	Null Hypothesis	Decision
Blackboard E-learn	Cognitive and meta-cognitive factors do not have any significant relationship with Blackboard E-learn.	Rejected null hypothesis at a 0.05 significance level.
Search engines	Cognitive and meta-cognitive factors do not have any significant relationship with search engines.	Rejected null hypothesis.
Instant messaging	Cognitive and meta-cognitive factors do not have any significant relationship with instant messaging.	Failed to reject null hypothesis.
YouTube	Cognitive and meta-cognitive factors do not have any significant relationship with YouTube.	Failed to reject null hypothesis.

To be continued...

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Ms PowerPoint	Cognitive and meta-cognitive factors do not have any significant relationship with Ms PowerPoint.	Rejected null hypothesis at a 0.05 significance level.
Facebook	Cognitive and meta-cognitive factors do not have any significant relationship with Facebook.	Failed to reject null hypothesis.
Email	Cognitive and meta-cognitive factors do not have any significant relationship with email.	Failed to reject null hypothesis.

The Pearson correlation results for cognitive and meta-cognitive factors and the frequency use of e-learning tools, the null hypothesis of search engines, Blackboard E-learn and Ms PowerPoint were able to be rejected (see Table 4.95). This indicated that these tools have a correlation with cognitive and meta-cognitive factors.

Search engines were resulted at 0.254 with significant level of $p < 0.01$. This implied that frequent use of search engine increases the students' thinking level. The more the students explore search engines, the more information they obtain and are able to solve complex problems.

The results also show that both Blackboard E-learn and Ms PowerPoint have a negative relationship whereas search engines have a positive relationship with the frequency of use. This indicates that students that use search engines tend to develop their thinking level higher and better as they use the tools progressively. The results also indicated that the increase in the

frequency use of Blackboard E-learn and Ms PowerPoint did not develop the cognitive skills.

Even though there is an increase of usage Blackboard E-learn, but it does not mean that there is a tremendous increase in students' cognitive level. Same goes to Ms PowerPoint where there is a correlation but it is a negative correlation. Frequent usage of Ms PowerPoint does have relationship with students' thinking level but not necessary it will increase their thinking capability all the time. This tool is usually used by students to view course slides given by the lecturers unless they are using the tool for their class presentation. The negative correlation indicates that there is not much of thinking needed in using Ms PowerPoint compared search engines.

b. Motivational and Affective Factors and the frequency use of e-learning tools

Based on the results for motivational and affective factors as shown in Tables 4.96 to 4.102, only the frequency of the uses of Blackboard E-learn (see Table 4.96), YouTube (see Table 4.99), Ms PowerPoint (see Table 4.100) and email (see Table 4.102) show a significant relationship with motivational and affective factors.

For the relationship between motivational and affective factors and the frequency use of Blackboard E-learn, the p-value was found to be significant ($r = -0.189$, $p < 0.01$) (see Table 4.96). Therefore there was strong evidence to

reject the null hypothesis. The motivational and affective factors were negatively correlated with the frequency use of Blackboard E-learn ($r = -0.189$).

For the relationship between motivational and affective factors and the frequency use of YouTube, the p-value was found to be significant ($r = -0.150$, $p < 0.05$) (see Table 4.99). Therefore there was enough evidence to reject the null hypothesis. The motivational and affective factors were negatively correlated with the frequency use of YouTube ($r = -0.150$).

For the relationship between motivational and affective factors and the frequency use of Ms PowerPoint, the p-value was found to be significant ($r = -0.161$, $p < 0.05$) (see Table 4.100). Therefore there was enough evidence to reject the null hypothesis. The motivational and affective factors were negatively correlated with the frequency use of Ms PowerPoint ($r = -0.161$).

For the relationship between motivational and affective factors and the frequency use of email, the p-value was found to be significant ($r = -0.241$, $p < 0.01$, see Table 4.102). Therefore there was strong evidence to reject the null hypothesis. The motivational and affective factors were negatively correlated with the frequency use of email ($r = -0.241$).

However, the other two e-learning tools which are instant messaging (see Table 4.98) and Facebook (see Table 4.101) which indicates a no correlation with motivational and affective factors. This again could indicate

that these e-learning tools are not being used for motivational purposes in learning knowledge but just for social and interaction between family and friends.

Table 4.96: Pearson correlation results for Motivational and Affective Factors and frequency use of Blackboard E-Learn

Domain factors		Blackboard E-Learn
Motivational and Affective factors	Pearson Correlation	-0.189**
	Sig. (2-tailed)	0.009
	N	191

**. Correlation is significant at the 0.01 level (2-tailed)

Table 4.97: Pearson correlation results for Motivational and Affective Factors and frequency use of Search Engines

Domain factors		Search Engine
Motivational and Affective factors	Pearson Correlation	0.120
	Sig. (2-tailed)	0.098
	N	191

Table 4.98: Pearson correlation results for Motivational and Affective Factors and frequency use of Instant Messaging

Domain factors		Instant Messaging
Motivational and Affective factors	Pearson Correlation	-0.072
	Sig. (2-tailed)	0.323
	N	191

Table 4.99: Pearson correlation results for Motivational and Affective Factors and frequency use of YouTube

Domain factors		YouTube
Motivational and Affective factors	Pearson Correlation	-0.150*
	Sig. (2-tailed)	0.039
	N	191

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.100: Pearson correlation results for Motivational and Affective Factors and frequency use of Ms PowerPoint

Domain factors		Ms PowerPoint
Motivational and Affective factors	Pearson Correlation	-0.161*
	Sig. (2-tailed)	0.026
	N	191

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.101: Pearson correlation results for Motivational and Affective Factors and frequency use of Facebook

Domain factors		Facebook
Motivational and Affective factors	Pearson Correlation	-0.078
	Sig. (2-tailed)	0.283
	N	191

Table 4.102: Pearson correlation results for Motivational and Affective Factors and frequency use of Email

Domain factors		Email
Motivational and Affective factors	Pearson Correlation	-0.241**
	Sig. (2-tailed)	0.001
	N	191

**. Correlation is significant at the 0.01 level (2-tailed).

Summary of H2b Testing

From the above data analysis a decision can be made toward accepting or rejecting the research null hypothesis as follows:

$H_0$2b: Motivational and affective factors do not have any significant relationship with the use of e-learning tools among university students.

Table 4.103 shows the hypotheses for each learning tool and decision of acceptance or rejection for each tool. Based on the summary shown in Table 4.103, the decision of acceptance or rejection for the entire research null hypothesis ($H_0$2b) was made.

The Pearson correlation results for motivational and affective factors and the frequency use of e-learning tools show that only Blackboard E-learn, YouTube, Ms PowerPoint and email were able to reject the null hypothesis (see Table 4.103). This indicated that these tools have correlation with motivational and affective factors. This is likely that by using these e-learning tools frequently, it increases the motivational level among University students.

The results show that Blackboard E-learn, YouTube, Ms PowerPoint and email have negative correlations. This indicates that even though there is a high usage of these tools by the students does not indicate that there will be an increase of motivation as they use the tools.

Table 4.103: Summary of research hypothesis findings (H2b) on motivational and affective factors and the decisions

E-learning tool	Null Hypothesis	Decision
Blackboard E-learn	Motivational and affective factors do not have any significant relationship with Blackboard E-learn.	Rejected null hypothesis.
Search engines	Motivational and affective factors do not have any significant relationship with search engines.	Failed to reject null hypothesis.

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Instant messaging	Motivational and affective factors do not have any significant relationship with instant messaging.	Failed to reject null hypothesis.
YouTube	Motivational and affective factors do not have any significant relationship with YouTube.	Rejected null hypothesis at a 0.05 significance level.
Ms PowerPoint	Motivational and affective factors do not have any significant relationship with Ms PowerPoint.	Rejected null hypothesis at a 0.05 significance level.
Facebook	Motivational and affective factors do not have any significant relationship with Facebook.	Failed to reject null hypothesis.
Email	Motivational and affective factors do not have any significant relationship with email.	Rejected null hypothesis.

c. Development and Social Factors and the frequency use of e-learning tools

Based on the results for development and social factors as shown in tables 4.104 to 4.110, only the frequency of use of two e-learning tools, i.e. Blackboard E-learn (see Table 4.104), and search engines (see Table 4.105) show a significant relationship with development and social factors.

For the relationship between development and social factors and the frequency use of Blackboard E-learn, the p-value was found to be significant ($r = -0.146$, $p < 0.05$) (see Table 4.104). Therefore there was enough evidence to

reject the null hypothesis. The development and social factors were negatively correlated with the frequency use of Blackboard E-learn ($r = -0.146$).

For the relationship between development and social factors and the frequency use of search engines, the p-value was found to be significant ($r= 0.212$, $p < 0.01$) (see Table 4.105). Therefore there was enough evidence to reject the null hypothesis. The development and social factors were negatively correlated with the frequency use of YouTube ($r = 0.212$).

This indicates that Blackboard E-learn has a negative correlation where else search engines have positive correlation. More usage the students have on search engine, the higher their development and social activities increase.

The other four e-learning tools namely instant messaging (see Table 4.106), YouTube (see Table 4.107), Ms PowerPoint (see Table 4.108) and email (see Table 4.110) indicated no correlation with development and social factors. This could also indicate that these e-learning tools are not really being used for development of knowledge and socialising purposes but just for individual type of activities. Facebook tool (see Table 4.109) show a slight correlation ($r = -0.133$, $p > 0.05$) with development and social factors. Facebook is a highly usage social media tool right now but results show in this table indicates weak relationship. Using Facebook for academic purposes it not much of a usage among Sunway University students.

Table 4.104: Pearson correlation results for Development and Social Factors and frequency use of Blackboard E-Learn

Domain factors		Blackboard E-Learn
Development and Social Factors	Pearson Correlation	-0.146*
	Sig. (2-tailed)	0.044
	N	191

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.105: Pearson correlation results for Development and Social Factors and frequency use of Search Engine

Domain factors		Search Engine
Development and Social Factors	Pearson Correlation	0.212**
	Sig. (2-tailed)	0.003
	N	191

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.106: Pearson correlation results for Development and Social Factors and frequency use of Instant Messaging

Domain factors		Instant Messaging
Development and Social Factors	Pearson Correlation	0.085
	Sig. (2-tailed)	0.242
	N	191

Table 4.107: Pearson correlation results for Development and Social Factors and frequency use of YouTube

Domain factors		YouTube
Development and Social Factors	Pearson Correlation	0.052
	Sig. (2-tailed)	0.478
	N	191

Table 4.108: Pearson correlation results for Development and Social Factors and frequency use of Ms PowerPoint

Domain factors		Ms PowerPoint
Development and Social Factors	Pearson Correlation	-0.107
	Sig. (2-tailed)	0.140
	N	191

Table 4.109: Pearson correlation results for Development and Social Factors and frequency use of Facebook

Domain factors		Facebook
Development and Social Factors	Pearson Correlation	-0.133
	Sig. (2-tailed)	0.067
	N	191

Table 4.110: Pearson correlation results for Development and Social Factors and frequency use of Email

Domain factors		Email
Development and Social Factors	Pearson Correlation	0.078
	Sig. (2-tailed)	0.287
	N	191

Summary of H2c Testing

From the above data analysis a decision can be made toward accepting or rejecting the research null hypothesis as follows:

$H_0$2c: Development and social factors do not have any significant relationship with the use of e-learning tools among university students.

Table 4.111 shows the hypotheses for each learning tool and decision of acceptance or rejection for each tool. Based on the summary shown in Table 4.111, the decision of acceptance or rejection for the entire research null hypothesis ($H_0$2c) was made.

The Pearson correlation results for development and social factors and the frequency use of e-learning tools show that only Blackboard E-learn and search engines were able to reject the null hypothesis (see Table 4.104 and Table 4.105). This indicated that these tools have correlation with development and social factors. Both tools have significant relationship but in two different directions. Students tend to increase their development and social skills when they use search engine tool in comparison to Blackboard E-learn. This is due to the fact that Blackboard E-learn is not a site where it enables the students to develop or socialise in comparison to Facebook as the purpose of Blackboard E-learn is more to helping the lecturers to manage their course subject better not for socialising.

Unlike Blackboard E-Learn, the higher the usage of this tool, it does not make any difference in terms of development and social. This is because Blackboard E-learn is a common tool use by all students every semester and they only use the basic functions for their classes, i.e. download course materials, check announcements, check grades and upload assignments. This contradicts with the past studies that indicate that e-e-learning influences the development and social factors among students. Even though there is a high usage of these e-learning tools among students, it doesn't indicate there is a high increase of development and social. Blackboard E-learn is use for managing course materials and so much for socialising. Therefore, the result did not indicate a positive relation but the other way round. There is a relationship between development and social factors and Blackboard E-Learn but in a different way.

Search engines in the other hand, had a positive correlation which indicates that as the usage of this tool increases, same goes to their development and social activities. When search engines were used frequently, it enables the students to increase their exploration for better knowledge and opportunities with the integration of social interactions. As students explore for ideas, more knowledge will be developed and by communicating with people, learning can be more interesting.

Table 4.111 Summary of research hypothesis (H2c) findings on development and social factors and the decisions

E-learning tool	Null Hypothesis	Decision
Blackboard E-learn	Development and social factors do not have any significant relationship with Blackboard E-learn.	Rejected null hypothesis at a 0.05 significance level.
Search engines	Development and social factors do not have any significant relationship with search engines.	Rejected null hypothesis.
Instant messaging	Development and social factors do not have any significant relationship with instant messaging.	Failed to reject null hypothesis.
YouTube	Development and social factors do not have any significant relationship with YouTube.	Failed to reject null hypothesis.
Ms PowerPoint	Development and social factors do not have any significant relationship with Ms PowerPoint.	Failed to reject null hypothesis.
Facebook	Development and social factors do not have any significant relationship with Facebook.	Failed to reject null hypothesis.

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Email	Development and social factors do not have any significant relationship with email.	Failed to reject null hypothesis.

d. Individual-Difference factors and the frequency use of e-learning tools

Based on the results for individual-difference factors as shown in Tables 4.112 to 4.118, only the frequency of use of search engines show a significant relationship with motivational and affective factors (see Table 4.113).

For the relationship between individual-difference factors and the frequency use of search engines, the p-value was found to be significant ($r = 0.225$, $p < 0.01$) (see Table 4.113). Therefore there was strong evidence to reject the null hypothesis. The individual-difference factors were negatively correlated with the frequency use of search engines ($r = 0.225$).

The results show that search engine tool has a positive correlation with individual-difference factors. This indicates that search engines are able to cater for all type of students with different capabilities and intelligence. Besides, search engines are very useful for doing search especially for assignments and tutorials. This also indicates a high usage of this tool among Sunway University students. Any students with different knowledge, different skills and capabilities are able to use this tool for their academic activities.

However, the other six chosen e-learning tools namely Blackboard E-learn (see Table 4.112), instant messaging (see Table 4.114), YouTube (see Table 4.115), Ms PowerPoint (see Table 4.116), Facebook (see 4.117) and email (see Table 4.118) indicated no correlation with individual-difference factors. Since individual-difference factors also concern with students cultural background, this also indicates that students who are from countries that has exposure to technology tends to share knowledge with other students and tend to have a higher motivational level in learning.

Table 4.112: Pearson correlation results for Individual-Difference Factors and frequency use of Blackboard E-Learn

Domain factors		Blackboard E-Learn
Individual-Difference Factors	Pearson Correlation	-0.086
	Sig. (2-tailed)	0.238
	N	191

Table 4.113: Pearson correlation results for Individual-Difference Factors and frequency use of Search Engine

Domain factors		Search Engine
Individual-Difference Factors	Pearson Correlation	0.225**
	Sig. (2-tailed)	0.002
	N	191

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.114: Pearson correlation results for Individual-Difference Factors and frequency use of Instant Messaging

Domain factors		Instant Messaging
Individual-Difference Factors	Pearson Correlation	0.046
	Sig. (2-tailed)	0.527
	N	191

Table 4.115: Pearson correlation results for Individual-Difference Factors and frequency use of YouTube

Domain factors		YouTube
Individual-Difference Factors	Pearson Correlation	-0.009
	Sig. (2-tailed)	0.896
	N	191

Table 4.116: Pearson correlation results for Individual-Difference Factors and frequency use of Ms PowerPoint

Domain factors		Ms PowerPoint
Individual-Difference Factors	Pearson Correlation	-0.061
	Sig. (2-tailed)	0.404
	N	191

Table 4.117: Pearson correlation results for Individual-Difference Factors and frequency use of Facebook

Domain factors		Facebook
Individual-Difference Factors	Pearson Correlation	-0.089
	Sig. (2-tailed)	0.219
	N	191

Table 4.118: Pearson correlation results for Individual-Difference Factors and frequency use of Email

Domain factors		Email
Individual-Difference Factors	Pearson Correlation	-0.104
	Sig. (2-tailed)	0.154
	N	191

Summary of H2d Testing

From the above data analysis a decision can be made toward accepting or rejecting the research null hypothesis as follows:

$H_0$2d: Individual-difference factors do not have any significant relationship with the use of e-learning tools among university students.

Table 4.119 shows the hypotheses for each learning tool and decision of acceptance or rejection for each tool. Based on the summary shown in Table 4.119, the decision of acceptance or rejection for the entire research null hypothesis ($H_0$2d) was made.

Table 4.119: Summary of research hypothesis findings (H2d) on individual-difference factors and the decisions

E-learning tool	Null Hypothesis	Decision
Blackboard E-learn	Individual-difference factors do not have any significant relationship with Blackboard E-learn.	Failed to reject null hypothesis.
Search engines	Individual-difference factors do not have any significant relationship with search engines.	Rejected null hypothesis.
Instant messaging	Individual-difference factors do not have any significant relationship with instant messaging.	Failed to reject null hypothesis.
YouTube	Individual-difference factors do not have any significant relationship with YouTube.	Failed to reject null hypothesis.
Ms PowerPoint	Individual-difference factors do not have any significant relationship with Ms PowerPoint.	Failed to reject null hypothesis.
Facebook	Individual-difference factors do not have any significant relationship with Facebook.	Failed to reject null hypothesis.
Email	Individual-difference factors do not have any significant relationship with email.	Failed to reject null hypothesis.

The Pearson correlation results for individual-difference factors and e-learning tools show that only search engines were able to reject hypothesis null (see Table 4.113). This indicated that search engines have correlation with individual-difference factors.

In order to use search engines, a student must know how to use appropriate keywords to find for information. If failed to do so, it will not generate the desired results. This also implied to the learning background they came from. If a student from a country has not adapted to the practise of using search engine tool, she or he will have problem when studying abroad. Besides that, McCombs (2005) emphasized in her research that setting appropriate set of assessments and standard are integral part of learning process. Students tend to use search engines a lot for research. The only difference is their capability is in using the tool. Therefore, search engines do have positive relationship with individual-difference factors.

This indicates that Blackboard E-learn, instant messaging, YouTube, Ms PowerPoint, Facebook and email do not have any impact on the differences of students' learning capabilities, culture and social background. Even though there are differences among students in terms of their learning strategies, approaches or even capabilities, it makes no differences to these six tools. Furthermore, their cultural background or even their social background does not differentiate them when using these six tools in comparison to search engines.

4.3 Conclusions on the Significance of Findings

This section presents the discussion on the significance of findings for this study. The discussion is divided into two sections as follows:

1. Significance effects between demographic variables (e.g. gender, the level of study, and school of study) and students perception toward the use of e-learning tools
2. Significance relationship between the four factors in the McCombs' learner framework and the frequency use of e-learning tools

4.3.1 Significance Effects between Demographic Variables and Students Perception toward the use of E-Learning Tools

This study found that, as anticipated, the experiences students had in using the e-learning tools in their everyday lives and using it for learning were very different. As shown by the data, level of study groups has significant effect on the usage of e-learning tools in comparison to school of study and gender. It is worthy to note that level of study groups has differences in terms of using the e-learning tools due to the level of their course and the number of years and experiences they have in using the tool. To compare between diploma and undergraduate students, it is known fact that undergraduate students have better exposure to e-learning tools. Some of the undergraduate courses can be home-grown, affiliated with aboard universities or even a twinning programme. If it is affiliated or a twinning programme, there is a

better chance to get some knowledge on how the other counterpart runs their programme and what e-learning tools they are using. By doing so, a local-based University can adopt the similar method(s) to their courses and at the same time, they can upgrade their course structure. In Sunway University, all the diploma courses are home-grown not affiliated or in a twinning programme so the exposure to e-learning tools are very minimal.

Level of study groups contrasts with school of study groups and gender groups which have no differences in using e-learning tools chosen for this study. It means that all the students in Sunway University in spite of which school or which gender they are, uses e-learning tools either for their learning process or for leisure. It is a positive indication because it shows that from whichever background of study students are majoring; e-learning tools are known to them. For example, students majoring in non-computer related courses such as nursing, psychology, hospitality, tourism even hotel management have knowledge on e-learning tools. The only difference is the number of years they are exposed to the e-learning tools, how depth they know how to use the tools and whether they are made known about the e-learning tools by their instructors or lecturers for their learning process.

4.3.2 Relationship between McCombs' Learner-Centred Framework and E-learning tools.

As what can be seen in the data, McCombs learner-centred framework does play a role in finding out whether University students have a negative or

positive perception towards e-learning tools. According to McCombs and Vakili (2005), e-learning technologies can provide a capacity to bring people together to expand and transform information into knowledge from a learner-centred perspective. However, human factor should also be taken into consideration in giving support and guidance to the learners. There should be a blended learning education system where technology does not control learners but to give services to the learners.

Moreover, McCombs and Vakili learner-centred psychological principles which comprises of four domain factors used in this study do influences the students when using the e-learning tools. As shown by the data, some of the chosen e-learning tools do help learners to think better and deeper when trying to learn new knowledge in a subject area. That means that e-learning tools do change the way the students think and change the way the students solve complex problems through guidance and support.

Student's motivation level does increase when using e-learning tools. This indicates that these tools are generally easy to navigate, user-friendly and reliable. Whichever level, school, gender, age or even cultural background a student came from; using e-learning tools should be convenient and easy from them. This could link with the third domain factors which state the relationship between development and social factors with e-learning tools. If there is a motivation in using the e-learning tool, then there is a tendency that a student will develop their knowledge and skills as they progressively uses the e-learning tools. If there is no motivation, then using the e-learning tool is a

waste of time. If students are willing to socialise and share knowledge when using e-learning tools, learning becomes better and fruitful.

There are a lot of opportunities that a student can grab from using e-learning tools, it is just how deep a student is willing to learn and explore. The more students explore the e-learning tools; more knowledge could be benefited for their learning process. As students progress from diploma to undergraduate level, they will appreciate the amount of knowledge they gained from the number of years they are in the University. Differences between students also play a role in using the e-learning tools, students with better capabilities for learning and students from a more modern and developed cultural background tend to have a better understanding on e-learning tools.

Therefore, by having both opposite groups together in a class, it will give a better opportunity for the less-capable students to learn from the better students through communication and socialising. Furthermore, if appropriate planning and induction strategies are looked into and taken into consideration, the evidence from this study is that students' perceptions about e-learning will improve once they experience some learning benefits (Lam, 2009).

4.4 Additional findings on students' opinions on purposes and strengths of e-learning tools

Besides selecting the preferred purposes and strengths from a number of choices in the questionnaire, students were also asked to give their own

opinions on other purposes and strengths they think should be included as additional information to this study.

For Blackboard E-learn, one student has given other purpose in using this tool which was ‘check time-table’ and another student proposed other strength of Blackboard E-learn which included ‘24/7 accesses to course materials’.

As for search engines, several students have given other purposes in using this tool such as ‘studying and understanding’, ‘find songs, popular videos and news feed’, ’upgrade myself with latest news’, ‘find singers’, download lecture notes’, ‘just to surf the net, Facebook, Twitter and also games, Skype, Msn Messenger and YouTube’ and’ learning a skill’. Students also suggested other strengths of search engines which included ‘large database’, ‘use to translate language’, ‘find GPS’, ‘can help organise information based on different preferences and allow to access anytime and anywhere’, ‘for pleasure or for entertainment’ and ’search for free downloads’.

Moving on to instant messaging, a student has also given other purpose in using this tool such as ‘good to use when a student can’t attend classes’ and some students proposed other strengths of instant messaging which includes ‘convenient’, ‘easy’,’ time-saving’, ‘able to handle many chats at a time’ and ‘free texting if there is WIFI internet connection’.

YouTube in the other hand has additional opinions from several students who have stated that other purposes of using YouTube are to ‘hear song’, ‘watch video clips’, ‘to learn about programming language (education)’, ‘ listen to music’, ‘learn how to do things’ and ’research’. Another student proposed other strength of YouTube which was ‘entertaining’.

As for Ms PowerPoint, several students suggested other purposes in using this tool such as ‘for presentation’ and ‘use for academic’. Other strengths of Ms PowerPoint suggested were ‘easy to learn’,’ able to give flexibility in editing’ and ‘make presentation attractive’.

In addition, several students have also given other purposes in using Facebook such as ‘share information’, ‘read news that matter to social circle’ and’ create events’. Some students proposed other strengths of Facebook which included ‘login into website without registering’, ’organise meetings’,’ stay connected to friends and relatives who are abroad’ and ’ stalking people’.

Last but not least, some students proposed other purposes of email which were ‘share files’ and ‘create a discussion’ where else some students proposed other strengths of email which were ‘share files’, ‘create a discussion’ and ‘cheaper communication’.

This indicated that students, as a whole, understand the nature of these e-learning tools in terms of its usages and strengths. It is very interesting to

note that Sunway University students are aware of the existence of e-learning tools but was not able to implement entirely into their learning process due to the lack of support by the University itself in the usage of e-learning tools. Conclusion could be made that students, in general accept e-learning tools not only to be used for their daily lives but for their learning process.

4.5 Conclusions

This chapter was written to analysis whether the hypotheses identified in this study were accepted or rejected. By analysing the hypotheses using statistical tool such as SPSS version 2.0 programme, it gives a better understanding and interpretation on what to expect for the outcome of the study. Results from this chapter will help to identify any future work that could be done from the analysis. This will be further discussed in the final chapter on conclusions and discussion.

CHAPTER 5

CONCLUSIONS

5.1 Introduction

This chapter presents the results of the study according to the research questions identified in chapter 1. The organisation of this chapter includes limitations of the study, potential contribution of this study to research and practise and the recommendation for future research and lastly conclusions.

5.2 Limitations of the Study

There are several limitations to this study that should be taken into account.

Firstly, the study was conducted in Sunway University campus. The data were gathered at a single campus and were selected among several classes in the schools excluding Master and PhD students. The findings of this study may not generalise and draw overall conclusion to other populations in other programmes as well as other universities in Malaysia.

Secondly, the target group of this study involved students from University level thus the findings may not represent the students who are doing Matriculation level.

Lastly, the study merely focuses on the factors that might not suit Asian culture completely and it is limited to the common e-learning tools such as Blackboard E-Learn, Search Engine, Instant Messaging, YouTube, Facebook, Ms PowerPoint and Email.

5.3 Recommendations for Future Research

This research has yielded a number of potential avenues for future research.

First and foremost, this study suggest that future research endeavours of this nature should attempt to include students from Pre-University, Master and PhD programmes who are also prompt to be users of e-learning tools. Their data will provide a better conclusion to support the alternative hypotheses for this study. By doing this, a clearly conclusion could be drawn whether e-learning tools are preferred by all level of students in a particular university.

Second, other factors besides psychological factors in McCombs framework should also be taken into consideration to find out the students' awareness and perception levels. The non-rejected hypotheses also suggest the

plausibility of including other factors to this model. Further research on learner-centred framework would be an advantage to identify other factors which would influence the usage of e-learning tools among students.

Third, this study should attempt to include lecturers' opinion on e-learning tools to examine the difference of opinion between lecturers and students. Answering all these questions will help Universities to prepare for a better teaching and learning system by blending both face to face and e-learning together.

Fourthly, future work should include making comparison between students in public and private universities. By doing so, it can give indications whether students in both public and private universities have the same opinion on the usage of e-learning tools.

5.4 Potential Contributions of this Study to Research and Practice

This section explains the contribution of this study to research and practice. There are several contributions that can be drawn from the results of this study. The theoretical on research as well as practical contributions are highlighted in the following section.

5.4.1 Contribution of this Study to Research

The study makes important contributions to emerging body of knowledge on the understanding of psychological principles pertaining to the learners' learning process. Initially, the study highlights the theoretical explanation on the adoption of McCombs' learner-centred framework on Sunway University students. To predict the relationship between the framework and e-learning tools, the study uses the four domain factors from the framework to formulate the research model and research hypotheses. The statistical significances were employed to test the research model. By doing so, conclusions could be made whether the four domain factors under McCombs' learner-centred framework were reliable to be used as a guideline in developing a better teaching and learning process.

5.4.2 Contribution of this Study to Practice

This study applies the concept of e-learning to evaluate the students' preferences towards e-learning tools. This research has shown a moderate level of awareness among Sunway University students. When filling up the questionnaires, students tend to develop a better understanding on the purposes and strengths of using e-learning tools. Student's awareness and perception towards the tools have increased as they tried to understand how much they know about a particular tool when filling up the questionnaire. This lead to students sharing with their lecturers on what kind of new e-learning tools they can adopt in the teaching and learning process. It is interesting to note that

students do appreciate the existence of e-learning tools and using it either for education or leisure.

5.5 Conclusions

This study has examined the effect of e-learning tools in the context of University students as users and established factors which are significant to their learning process. The findings tend to suggest that students are, on the whole willing to accept e-learning tools for their learning process. While most of the students use computers for a variety of purposes, they use them very heavily for social networking and communication purposes, especially with the evolving technologies developed for social network sites such as Facebook and Twitter.

However, the result of this study is hoped to contribute in developing an understanding of important factors influencing awareness and perception of University students towards e-learning tools. This could achieve by organising more workshops and seminars on promoting the usage of e-learning tools in University and matriculation levels. These workshops and seminars are important approaches but such programmes are also effective if lecturers and students are willing to use and adopt these e-learning tools in their teaching and learning process.

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APPENDIX A

Data Collection Approval Letters to the Head of Departments

Sophia Latt
School of Computer Technology
Sunway University

Head (Academic) - Department of Business and Marketing
School of Business
Sunway University

05.03.2011

Dear Dr Cheah You Sum,

Re: Seeking your permission to conduct a study on "Awareness & Perception of University Students on E-learning tools: A Case Study on Sunway University"

I am a Post-graduate student from Faculty of Engineering & Science, Universiti Tunku Abdul Rahman (UTAR). I am currently pursuing Masters of Information Systems and I would like to solicit your help and support for my research to fulfil the requirements of my degree.

I would like to seek your permission to allow me to distribute survey questionnaires to few of your colleagues in your school. I have approached few but I would like to get your approval first before moving further.

Please find attached of my abstract. Should you need any clarification, please contact me at 019-6643411 or via email at sophia@sunway.edu.my

Thank you for your time and your assistance will be highly appreciated.

Yours sincerely
Sophia Latt

Sophia Latt
School of Computer Technology
Sunway University

Head - School of Health and Natural Sciences
Sunway University

05.03.2011

Dear Prof. Poh Chit Laa,

Re: Seeking your permission to conduct a study on "Awareness & Perception of University Students on E-learning tools: A Case Study on Sunway University"

I am a Post-graduate student from Faculty of Engineering & Science, Universiti Tunku Abdul Rahman (UTAR). I am currently pursuing Masters of Information Systems and I would like to solicit your help and support for my research to fulfil the requirements of my degree.

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Please find attached of my abstract. Should you need any clarification, please contact me at 019-6643411 or via email at sophia@sunway.edu.my

Thank you for your time and your assistance will be highly appreciated.

Yours sincerely
Sophia Latt

Sophia Latt
School of Computer Technology
Sunway University

Head - School Of Hospitality, Tourism & Leisure Management
Sunway University

05.03.2011

Dear Ms. Anisha Chai Mee Fong,

Re: Seeking your permission to conduct a study on "Awareness & Perception of University Students on E-learning tools: A Case Study on Sunway University"

I am a Post-graduate student from Faculty of Engineering & Science, Universiti Tunku Abdul Rahman (UTAR). I am currently pursuing Masters of Information Systems and I would like to solicit your help and support for my research to fulfil the requirements of my degree.

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Please find attached of my abstract. Should you need any clarification, please contact me at 019-6643411 or via email at sophia@sunway.edu.my

Thank you for your time and your assistance will be highly appreciated.

Yours sincerely
Sophia Latt

Sophia Latt
School of Computer Technology
Sunway University

Head
School of Creative Arts and Communication
Sunway University

05.03.2011

Dear Dr. Lee Ei Leen,

Re: Seeking your permission to conduct a study on "Awareness & Perception of University Students on E-learning tools: A Case Study on Sunway University"

I am a Post-graduate student from Faculty of Engineering & Science, Universiti Tunku Abdul Rahman (UTAR). I am currently pursuing Masters of Information Systems and I would like to solicit your help and support for my research to fulfil the requirements of my degree.

I would like to seek your permission to allow me to distribute survey questionnaires to few of your colleagues in your school. I have approached few but I would like to get your approval first before moving further.

Please find attached of my abstract. Should you need any clarification, please contact me at 019-6643411 or via email at sophia@sunway.edu.my

Thank you for your time and your assistance will be highly appreciated.

Yours sincerely
Sophia Latt

Sophia Latt
School of Computer Technology
Sunway University

Head
School of Computer Technology
Sunway University

05.03.2011

Dear Assoc. Prof. Dr Lim Tong Ming,

Re: Seeking your permission to conduct a study on "Awareness & Perception of University Students on E-learning tools: A Case Study on Sunway University"

I am a Post-graduate student from Faculty of Engineering & Science, Universiti Tunku Abdul Rahman (UTAR). I am currently pursuing Masters of Information Systems and I would like to solicit your help and support for my research to fulfil the requirements of my degree.

I would like to seek your permission to allow me to distribute survey questionnaires to few of your colleagues in your school. I have approached few but I would like to get your approval first before moving further.

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Thank you for your time and your assistance will be highly appreciated.

Yours sincerely
Sophia Latt

APPENDIX B

Sample of Questionnaire

Dear Participant:

My name is Sophia btn Hj. Hasan Latt and I am a postgraduate student at Universiti Tunku Abdul Rahman. For my Master's project, I am investigating the awareness of Sunway University students on the useful of e-learning tools in teaching and learning processes, factors that influence their use of e-learning tools, and their perception toward e-learning tools. Thus, I am inviting you to participate in this study by completing the attached survey. In order for the results of this survey to truly represent your thinking, it is important that you fully complete the enclosed questionnaire.

The following questionnaire will require approximately 20-minute to complete. The answers to this questionnaire are absolutely confidential. No individual responses will be reported. Please answer all questions as honestly as possible and return the completed questionnaires promptly to me on the spot, or at my Staff Room No. 222 (School of Computer Technology (SCT), 2nd floor, North Building) or your lecturer who helps me to conduct the survey.

Thank you for taking the time to assist me in my educational endeavours. The data collected will provide useful information to my research on the areas as stated above. If you require additional information or have questions, please contact me at the email or number listed below.

Sincerely,

Sophia Latt

Sophia btnHj.HasanLatt @ HninWaiLatt
Tel: 03-74918622 EXT 3810 or 019-6643411
Email: sophia@sunway.edu.my

SECTION A: INFORMATION ON THE USE OF E-LEARNING TOOLS

Note: This section helps the researcher to find out more about your use of e-learning tools. Please indicate your choice (tick [✓] in the boxes provided) on how frequent you use the tool, your experiences in using the tool, your purpose(s) of using the tool and your opinion on the strength(s) of the tool.

A1. Blackboard E-Learn

How frequent you use this tool (Please tick ONE)	**Your experiences in using this tool (Please tick ONE)**	**Your purpose(s) of using this tool (Please tick all that apply)**	**Your opinion on the strength(s) of this tool (Please tick all that apply)**
☐ Everyday ☐ Once a week ☐ Few times a week ☐ Occasionally ☐ Never	☐ Less than a year ☐ 1 year ☐ 2 years ☐ 3 years ☐ 4 years or more	☐ Download course materials ☐ Upload assignment ☐ Participate in discussion board ☐ Self-enrolment to subject(s) ☐ Check grades ☐ Check announcements ☐ Others (Please list): _____ _____	☐ One point of access ☐ Easy standardization of course materials ☐ Streamlined distribution and updating of lecture notes ☐ Others (Please list): _____ _____

A2. Search Engines (e.g. : Google, Yahoo, Bing, Ask Jeeves, Lycos)

How frequent you use this tool (Please tick ONE)	**Your experiences in using this tool (Please tick ONE)**	**Your purpose(s) of using this tool (Please tick all that apply)**	**Your opinion on the strength(s) of this tool (Please tick all that apply)**
☐ Everyday ☐ Once a week ☐ Few times a week ☐ Occasionally ☐ Never	☐ Less than a year ☐ 1 year ☐ 2 years ☐ 3 years ☐ 4 years or more	☐ Do research ☐ Finding solutions to problems ☐ Others (Please list): _____ _____	☐ Able to perform keyword research ☐ Provide quality information ☐ Wide variety of information ☐ Faster way in researching things ☐ Easier way in researching things ☐ Others (Please list): _____ _____

A3. Instant Messaging			
How frequent you use this tool (Please tick ONE)	**Your experiences in using this tool (Please tick ONE)**	**Your purpose(s) of using this tool (Please tick all that apply)**	**Your opinion on the strength(s) of this tool (Please tick all that apply)**
☐ Everyday ☐ Once a week ☐ Few times a week ☐ Occasionally ☐ Never	☐ Less than a year ☐ 1 year ☐ 2 years ☐ 3 years ☐ 4 years or more	☐ Chat with lecturers and friends ☐ Upload files ☐ Send files ☐ Discuss assignments ☐ Participate in chat rooms ☐ Others (Please list): _____ _____	☐ Simple and fast ☐ Cheap ☐ Feasible communication ☐ Good platform for socializing ☐ Others (Please list): _____ _____
A4. YouTube			
How frequent you use this tool (Please tick ONE)	**Your experiences in using this tool (Please tick ONE)**	**Your purpose(s) of using this tool (Please tick all that apply)**	**Your opinion on the strength(s) of this tool (Please tick all that apply)**
☐ Everyday ☐ Once a week ☐ Few times a week ☐ Occasionally ☐ Never	☐ Less than a year ☐ 1 year ☐ 2 years ☐ 3 years ☐ 4 years or more	☐ Post video clips ☐ Download video clips ☐ Video clips sharing ☐ Edit video clips ☐ Others (Please list): _____ _____	☐ Simple to use the website ☐ Availability of updated video clips ☐ Watch video with a click of a button ☐ Ability to broadcast to millions of viewers ☐ Users are able to control video clips ☐ Others (Please list): _____ _____

A5. Ms PowerPoint			
How frequent you use this tool (Please tick ONE)	**Your experiences in using this tool (Please tick ONE)**	**Your purpose(s) of using this tool (Please tick all that apply)**	**Your opinion on the strength(s) of this tool (Please tick all that apply)**
☐ Everyday ☐ Once a week ☐ Few times a week ☐ Occasionally ☐ Never	☐ Less than a year ☐ 1 year ☐ 2 years ☐ 3 years ☐ 4 years or more	☐ Create slides ☐ Edit slides ☐ Publish slides in web browser ☐ View slides ☐ Others (Please list): _____ _____	☐ Increase motivation ☐ Benefits over basic presentations ☐ Aid retention ☐ Better design compared to Overhead Projection (OHP) slides ☐ Others (Please list): _____ _____

A6. Facebook			
How frequent you use this tool (Please tick ONE)	**Your experiences in using this tool (Please tick ONE)**	**Your purpose(s) of using this tool (Please tick all that apply)**	**Your opinion on the strength(s) of this tool (Please tick all that apply)**
☐ Everyday ☐ Once a week ☐ Few times a week ☐ Occasionally ☐ Never	☐ Less than a year ☐ 1 year ☐ 2 years ☐ 3 years ☐ 4 years or more	☐ Upload documents/photos/videos ☐ Post comments ☐ Chat with lecturers and classmates ☐ Create group ☐ Create ads (advertising purposes) ☐ Others (Please list): _____ _____	☐ Connected to people ☐ Updated news ☐ Global exposure ☐ Free advertising ☐ More personal connection ☐ Making friends with similar interests ☐ Others (Please list): _____ _____

A7. Email (e.g. Microsoft Outlook, Gmail, Yahoo mail, Hotmail)			
How frequent you use this tool (Please tick ONE)	**Your experiences in using this tool (Please tick ONE)**	**Your purpose(s) of using this tool (Please tick all that apply)**	**Your opinion on the strength(s) of this tool (Please tick all that apply)**
☐ Everyday ☐ Once a week ☐ Few times a week ☐ Occasionally ☐ Never	☐ Less than a year ☐ 1 year ☐ 2 years ☐ 3 years ☐ 4 years or more	☐ Send messages ☐ Receive messages ☐ Chat with lecturers and friends ☐ Attach files ☐ Organise events using calendar ☐ Organise tasks to do ☐ Others (Please list): _____ _____	☐ Sharing of productive ideas ☐ Archiving of information ☐ Access to information ☐ Better collaboration ☐ Reduce physical meetings ☐ Can check email anywhere and anytime ☐ Others (Please list): _____ _____

SECTION B: PREFERENCES OF COURSE DELIVERY AND LEARNING METHODS

Note: In this section, the researcher would like to find out your preferences of couse delivery and learning methods. Please indicate your choice (tick [✓] in the boxes provided) for each of the following statements.

B1. What kind of delivery methods your lecturers use in the delivery of lessons? (Please tick ONE)
☐ Face-to-face classroom instruction ☐ Online learning ☐ Hybrid (combination of face-to-face instruction and online learning)
B2. What kind of delivery method (s) you prefer for your course? (Please tick ONE)
☐ Face-to-face classroom instruction ☐ Online learning ☐ Hybrid (combination of face-to-face instruction and online learning)

B3. What are the limitations of the face-to-face course delivery methods? (Please tick all that apply)

- ☐ Lack of collaboration and communication between lecturers and students or vice versa
- ☐ Slow feedback from lecturers
- ☐ Lack of being student- centred
- ☐ Limitation of resources
- ☐ Generally, more expensive to conduct
- ☐ Existing delivery method (s) is/are boring and not creative
- ☐ Lack of strategic way of delivering course methods
- ☐ Others (Please specify): _____

_____

B4. What are the limitations of online course delivery methods? (Please tick all that apply)

- ☐ Must possess a minimum level of computer knowledge
- ☐ Require more time to learn than on-campus classes
- ☐ Lack of immediate feedback from lecturers and friends
- ☐ Frequent breakdown of technology (e.g. hardware, software, website, network)
- ☐ Delay in getting information
- ☐ Online courses require good time-management skills
- ☐ Create a sense of isolation (loneliness)
- ☐ Need to be an active learner (students)
- ☐ Responsible for your own learning (students)
- ☐ Others (Please specify): _____

_____

SECTION C: FACTORS THAT INFLUENCE YOUR USE OF E-LEARNING TOOLS AND YOUR PERCEPTIONS TOWARD E-LEARNING

Instruction: Please tick [✓] to indicate whether you Strongly Disagree, Disagree, Neither Agree nor Disagree (Neutral), Agree or Strongly Agree with each of the following statements.

C1. Cognitive and Meta-Cognitive factors

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	E-learning helps me access to real-time data, knowledge base, virtual simulations, media clips, web pages and etc.					
2.	I am able to interact better with my classmates using e-learning tools such as discussion boards, instant messaging, forums, social networks and etc.					
3.	I am able to understand difficult concepts using e-learning through the use of multimedia elements such as video, audio, graphics and animation.					
4.	E-learning supports collaboration using computer conferencing, chats, NetGroups, etc.).					
5.	My university resources (e.g. Blackboard E-Learn, course and school websites) support my learning.					
6.	The online learning experiences of my course are well-integrated with face to face learning.					
7.	I find using technology devices (e.g. PDAs, mobile phone, Ipad, etc) difficult for my learning.					

C2. Motivational and Affective factors

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	E-learning makes studying easier for me.					
2.	E-learning makes studying fun for me.					
3.	It would be good if there is much more e-learning in my courses.					
4.	E-learning provides technical support in assessments, email, peer networks, real-time chats, instant messaging, etc.					
5.	E-learning provides interactivity with my friends and lecturers (e.g. two way communication, personal control and able to make choices using a system).					
6.	I am able to access globally and share information with my friends and lecturers.					
7.	I feel committed to learning by using e-learning.					
8.	My online experiences help me engage actively in my learning.					
9.	E-learning is an important component of my course.					

C3. Developmental and Social factors

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I believe that using e-learning helps to increase my computer skills (e.g. searching for information, browsing the World Wide Web, sending emails, uploading video and audio, etc.).					
2.	I think using e-learning is better than traditional learning.					
3.	I am able to develop my communicative and online societal activities with the use of e-learning.					
4.	I am able to explore academic interests with my lecturers and friends.					
5.	I am learning to explore ideas confidently with other people.					
6.	I feel that I belong to the university community.					
7.	When studying for this course, I often set aside time to discuss course material with my group of friends.					
8.	When I can't understand the material in this course, I ask my friend for help using e-learning tools (e.g. forums, chats, Facebook, Twitter, Friendster, etc.).					
9.	Communicating online with my friends and my lecturers help improve my learning.					
10.	I am able to identify students whom I can ask for help if necessary (e.g. using Facebook, Twitter, forums, etc.).					

C4. Individual-Difference factors

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	E-learning tools provide multiple ways of displaying materials electronically (e.g. use of text-based material, graphics or video to accommodate different type of learners).					
2.	E-learning provides multiple pathways using text, graphics, audio, video or animation for nonlinear learning styles.					
3.	I am able to retrieve electronic feedback and electronic grades from my lecturers using Blackboard e-learn or respective course website.					
4.	I learn better when I have friends from different cultures and social backgrounds.					
5.	My lecturers set appropriate assessments according to our level of course and learning ability.					

SECTION D: PERSONAL DETAILS

Instruction: Please tick [✓] relevant boxes.

D1. Gender	**D3. Level of Study**
☐ Male ☐ Female	☐ Diploma level 1 ☐ Diploma level 2 ☐ Undergraduate level 1 ☐ Undergraduate level 2 ☐ Undergraduate level 3

D4. School of study (Please tick ONE)	**D5. Major of your study (Please tick ONE)**		
☐ School of Computer Technology ☐ School of Creative Arts & Communication ☐ School of Hospitality, Tourism & Leisure Management ☐ Sunway University Business School ☐ School of Health & Natural Sciences	☐ Information Technology ☐ Computer Science ☐ Information Systems ☐ Communication ☐ Art and design ☐ Psychology	☐ Accounting and Finance ☐ Business Management ☐ Business Studies ☐ Business Administration ☐ Nursing ☐ Performing Arts	☐ Tourism Management ☐ Hotel Management ☐ Culinary Arts ☐ Events Management ☐ International Hospitality Management

Thank you for completing this questionnaire