AN EMPIRICAL INVESTIGATION OF UNIVERSITY STUDENTS' ACCEPTANCE TOWARDS A LEARNING MANAGEMENT SYSTEM BASED ON A TECHNOLOGY ACCEPTANCE MODEL

By

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ABSTRACT

AN EMPIRICAL INVESTIGATION OF UNIVERSITY STUDENTS' ACCEPTANCE TOWARDS A LEARNING MANAGEMENT SYSTEM BASED ON A TECHNOLOGY ACCEPTANCE MODEL

Ooi Sze Hwei

This research aims to frame a technology acceptance model to investigate the user acceptance of a Learning Management System (LMS) among university students at a Malaysian university through an empirical study. The proposed model will have the power to demonstrate acceptance and usage behaviour of the LMS. In this research, LMS is referred to WBLE (Web-Based Learning Environment) used in Universiti Tunku Abdul Rahman (UTAR). This research also aims to: 1) investigate the extent to which users perceive that the WBLE is useful, easy to use, and their behavioural intention to use WBLE in their study; 2) study the impact of user demographics such as gender, level of study and course of study on their perceived usefulness (PU) and perceived ease of use (PEOU) of WBLE; and 3) examine the relationships among users' PU, PEOU, subjective norm (SN), and their behavioural intention to use (BITU) WBLE. Self-administered questionnaire was used to gather users' opinion on their degree of agreement with each statement that built into PU, PEOU, SN and BITU in the structured questionnaire. The questionnaire was pilot-tested and had demonstrated a high level of internal consistency and reliability among items. A sample of 445 UTAR students from different courses

participated in the questionnaire survey. Data collected was analysed using SPSS (Statistical Package for the Social Sciences). The research findings revealed that students perceived WBLE as useful and easy to use. The research findings also indicate that the students intend to use WBLE in their studies; PU, PEOU and SN are significant determinants of students' behavioural intention to use WBLE. Moreover, there is a statistically significant positive correlation between PEOU and PU. Nevertheless, student demographics have no impact on PEOU and PU. Overall, all the research objectives have been successfully achieved. Knowing the outcomes of the WBLE utilisation is important to evaluate the success of such system and plan for its future enhancement.

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APPROVAL SHEET

This dissertation entitled "**AN EMPIRICAL INVESTIGATION OF UNIVERSITY STUDENTS ' ACCEPTANCE TOWARDS A LEARNING MANAGEMENT SYSTEM BASED ON A TECHNOLOGY ACCEPTANCE MODEL**" was prepared by OOI SZE HWEI and submitted as partial fulfilment of the requirements for the degree of Master of Information Systems at Universiti Tunku Abdul Rahman.

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SUBMISSION OF DISSERTATION

It is hereby certified that **Ooi Sze Hwei** (ID No: **13UEM02737**) has completed this dissertation entitled "AN EMPIRICAL INVESTIGATION OF UNIVERSITY STUDENTS ' ACCEPTANCE TOWARDS A LEARNING MANAGEMENT SYSTEM BASED ON A TECHNOLOGY ACCEPTANCE MODEL" under the supervision of Dr. Siew Pei Hwa (Supervisor) from the Department of Multimedia Design & Animation, Faculty of Creative Industries.

I understand that 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,

_____

(OOI SZE HWEI)

DECLARATION

I **OOI SZE HWEI** 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.

OOI SZE HWEI

Date 21st November 2014

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LIST OF ABBRIEVIATIONS

Abbreviation	
BI	Behavioural Intention
BITU	Behavioural Intention to Use
HEIs	Higher Education Institutions
ICT	Information and Communication Technology
IT	Information Technology
LMS	Learning Management System
PBC	Perceived Behavioural Control
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
SN	Subjective Norm
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UTAR	Universiti Tunku Abdul Rahman
WBLE	Web-Based Learning Environment

CHAPTER 1

INTRODUCTION

1.1 Introduction

Since digital technology becomes an integral component of our life, the way we consume content has fundamentally changed. The advancement in information and communication technology (ICT) has triggered significant changes in all levels of education, from kindergarten right up to tertiary level. Education has evolved from the use of traditional modes of instructions to the use of ICT for instruction. Due to the availability of ICT resources, funds, and personnel, e-learning was introduced in Malaysia in 1998, and the higher learning institutions were the first to embrace the concept of web-based teaching and learning (Mohamad et al., 2005).

Many of the higher education institutions (HEIs) are evolving to meet the needs of learners in this new digital realm, during which educators have incorporated ICT tools in the instructional process as students become more IT savvy through what is called a Learning Management System (LMS) (Al-Busaidi and Al-Shihi, 2010). It is now common to find the LMS in use in all the public and private universities. E-learning has gradually becomes an important facilitator in teaching-learning process. According to Global Industry Analysts, the value of the global e-learning sector is estimated to hit $107

billion by the year of 2015 (Virtual College, 2012). Malaysia has the second highest growth rates for e-learning products in the world, at the record of 39.4%, which is more than four times the worldwide aggregate growth rate (Sawahel, 2013).

Through the review of extant literature, it was found that there are many advantages derived from e-learning. A well designed e-learning system could provide advantages like timely access to resources (Billings, 2002), up-to-date learning materials (Henderson, 2003), quickness access to wider range of resources (Sandars, 2006), cost effective (Hatakka et al., 2007), retainable (Kanniappan, 2007), interactive and collaborative (Pardesi, 2007), learner-centred (Den-Bossche et al., 2011) and more. However, these benefits would not be maximized if learners are not willing to adopt the system (Pituch and Lee, 2006). Apparently, the success of LMS in any educational institutions starts by students' acceptance, which in turns initiates and promotes students' utilisation of LMS in classes. Thus, it is necessary to assess the key barriers to the adoption of an e-learning system such as LMS among students because the user acceptance is often the pivotal factor determining the success or failure of an information system project (Davis, 1993).

Understanding students' perception towards an e-learning system is a crucial issue for improving e-learning usage and effects. Therefore, this research aims to frame a technology acceptance model (TAM) to investigate the usefulness and ease-of-use of an LMS from the perspective of university students. In this research, the LMS is referred to a web-based e-learning system

called WBLE (Web-Based Learning Environment). The proposed TAM integrates constructs from a well-established TAM which is developed by Davis in 1986. Knowing the outcomes of the WBLE utilisation is particularly important to evaluate the success of such system, plan for its future enhancement, and achieve better learning outcomes to enhance learning effectiveness it is also deemed useful as the sources of reference to the implementation of future LMS project.

1.2 Problem Statement

In recent years, the use of e-learning technology has become necessity within the HEIs (Wahab et al., 2011). Numerous HEIs embrace e-learning systems (such as LMS) as the medium of teaching and learning. Holley (2002 cited in Oye et al., 2012) claimed that students in HEIs who participate in online learning achieve better performance than students who engage in traditional face-to-face learning. In a survey conducted by EDUCAUSE Center for Analysis and Research in September 2013 (Dahlstrom et al., 2013), LMS is regarded as one of the most pervasive technology also most valued by 113,035 students from 251 universities across 13 countries. These students stated that LMS have the greatest impact on student success. Given the significant implication of LMS, ensuring LMS is delivering its pedagogical value to the students is therefore vital.

1.2.1 E-Learning Issues

Many HEIs today who have embarked in the development of e-learning system often encounter challenges in the implementation and process (Ehlers 2004 cited in Wan-Ismail and Hosseini, 2014). Saadé (2003) stated that the delivery, effectiveness and the acceptance of the e-learning system becoming a hindrance to successful strategies of an educational institution. Ali (2004) asserted that low adoption rate has been one of the obstacles in implementing e-learning systems in Malaysia. High dropout rates have been reported for e-learning due to students' low degree of continuance intention to use e-learning systems (Drazdilova et al., 2010; Gaither, 2009).

In 2011, Hamat et al. (2011) discovered that LMS usage among 6,301 Malaysian HEIs students achieved 63.4% only, which still leave much room for improvement. García-Peñalvo et al. (2011) claimed that although adoption of LMS is high within HEIs, these systems have yet to produce desired and expected educational improvements. Fathema and Sutton (2013) had pointed out that various issues are currently impeding the comprehensive utilisation of the LMS. Previous studies such as Garrote and Pettersson, and Vovides et al. (2007, cited in Fathema and Sutton, 2013) stated that many instructors use the LMS simply as delivery mechanism for the students (e.g. posting grades), and they do not use the integrated functionalities. Fathema and Sutton also noted that Garrote and Pettersson (2007) and Nelson (2003) had identified several LMS features that were underutilised by teachers and students, which included discussion forums, chat and email.

1.2.2 Current State of WBLE Usage

In UTAR, WBLE usage continues to lag expectations in terms of quality and quantity. Students did not use WBLE as it designed to support. This can be traced from the results obtained from the survey where the primary reason login to WBLE reported by 99.3% of the respondents are to download course materials and 47.4% of them spent less than 15 minutes each time on WBLE. Apparently, students did not attain benefits of WBLE to the fullest extent and the pedagogical objectives are not being realized. Although studies discovered that e-learning can improve learning performance, yet the features and functionalities of the systems are often underutilised (Yusof et al., 2012). This is a waste of resources especially when those features may account for the cost of implementing LMS.

Moreover, among 445 UTAR students who were asked to indicate their frequency of using the common WBLE features listed in the questionnaire, substantial amount of the students reported that they had never used some of the features integrated in WBLE. These underutilised features include Chat (80.2%), Forum (70%), Blog (64.4%), and Calendar (60.7%) in WBLE.

1.2.3 Lack of Knowledge about LMS Acceptance

The major problem prompted in this research is the lack of knowledge about the LMS user acceptance. In fact, users' experiences of utilizing the system often neglected during the system implementation (Yusof et al., 2012),

which is the perceptions and responses that result of the use or anticipated use of the system (Wigelius and Vaataja, 2009). Monzavi et al. (2013) asserted that users' perception of a new system is an introduction to its acceptance.

Emelyanova and Voronina (2014) further strengthen that one of the keys to successful and efficient use of LMS is how the users adopt and perceive this learning platform. Hence, before investigate the factor that influence students' acceptance of LMS, it is important to first understand their current perception towards the system. Hence, this research will examine the perception of UTAR students toward WBLE, to what extent they believe that WBLE is useful and easy to use, and to what extent they are intend to use WBLE in their study.

Enjoying the advantages as a result of utilisation of LMS depends on efficient use of the system (Emelyanova and Voronina, 2014). Consequently, if user shows resistance against utilization of technology, the marked advantages are not achieved. Acceptance of LMS is imperative in deciding whether the system is usable and utilised by students in Malaysian universities (Almarashdeh et al., 2010 cited in Adzharuddin and Lee, 2013). Knowing students' intentions and understanding the factors that influence students' perception about e-learning can help institution to improve students' adoption to this learning environment (Grandon et al., 2005).

But what would be the factors that trigger a person to adopt a new information system? Whether the factors merely depend on the features of the

system itself or the characteristics of the people impact the user acceptance as well? Thus, another research objective is to examine the effect of students demographics such as gender, level of study and course of study on their perceptions toward the usefulness and ease of use of WBLE which led to their adoption of the system.

1.2.4 Inadequate LMS Acceptance Research in Malaysia HEIs Context

Citing Davis (1993), past studies (Boies and Lewis, 1991; McCarroll, 1991; Nickerson, 1981) proved that user acceptance is the core to the success of an IT system. Nonetheless, through the literature review thus far, it was found that scarcely research was conducted within the Malaysia higher education context to empirically determine the relationship of tertiary students' LMS usage with personal determinants such as perceived usefulness, ease of use, and social influence such as subjective norm. The scarcely research justifies the purpose of this research. The relationships between UTAR students' perceived usefulness, perceived ease of use, subjective norm, and their behavioural intention to use WBLE will be examined in this research.

1.3 Research Objectives and Hypotheses

Given the importance of assessing the acceptance of university students towards a learning management system based on a technology acceptance model (through identifying the problems about current state of WBLE usage

and issues pertaining to LMS acceptance as discussed in previous section, and based on the preceding literature review which are discussed in chapter 2), the primary aim of this research aims to investigate user acceptance of a web-based e-learning system called WBLE (Web-Based Learning Environment) among UTAR students using a proposed Technology Acceptance Model (TAM) through an empirical study. Specifically the following objectives are formed:

i. To develop and empirically test a TAM which is built using Davis's TAM as the foundation.

ii. To investigate the extent to which UTAR students perceive that the WBLE is useful and easy to use, and their behavioural intention to use WBLE in their studies.

iii. To study the effects of UTAR student demographics such as gender, level of study, and course of study on their perceived usefulness and ease of use of WBLE.

iv. To examine the relationships among UTAR students' perceived usefulness of WBLE, perceived ease of use of WBLE, subjective norm, and their behavioural intention to use WBLE.

In accordance with the foregoing research objectives ii through iv, the following hypotheses are formulated:

H1: UTAR students perceive that WBLE is useful and easy to use.

H2: UTAR students intend to use WBLE in their studies.

H3: UTAR student demographics such as gender, level of study, and course of study have significant effects on the perceived usefulness and perceived ease of use of WBLE.

H4: There is a significant relationship between perceived ease of use and perceived usefulness of WBLE.

H5: There is a significant relationship between perceived usefulness and behavioural intention to use WBLE.

H6: There is a significant relationship between perceived ease of use and behavioural intention to use WBLE.

H7: There is a significant relationship between subjective norm and behavioural intention to use WBLE.

The results of the hypotheses testing will then validate the first research objective in which a proposed TAM is developed.

1.4 Research Scope

This research focuses on the usage behaviour of students together with their intention to maximize the usage of LMS (i.e. WBLE in this research) in their study. The research samples were limited to foundation studies and undergraduate students in UTAR. These samples must have the access to WBLE and have some experiences in using WBLE prior to the questionnaire survey. The research flow is depicted in Figure 1.1.

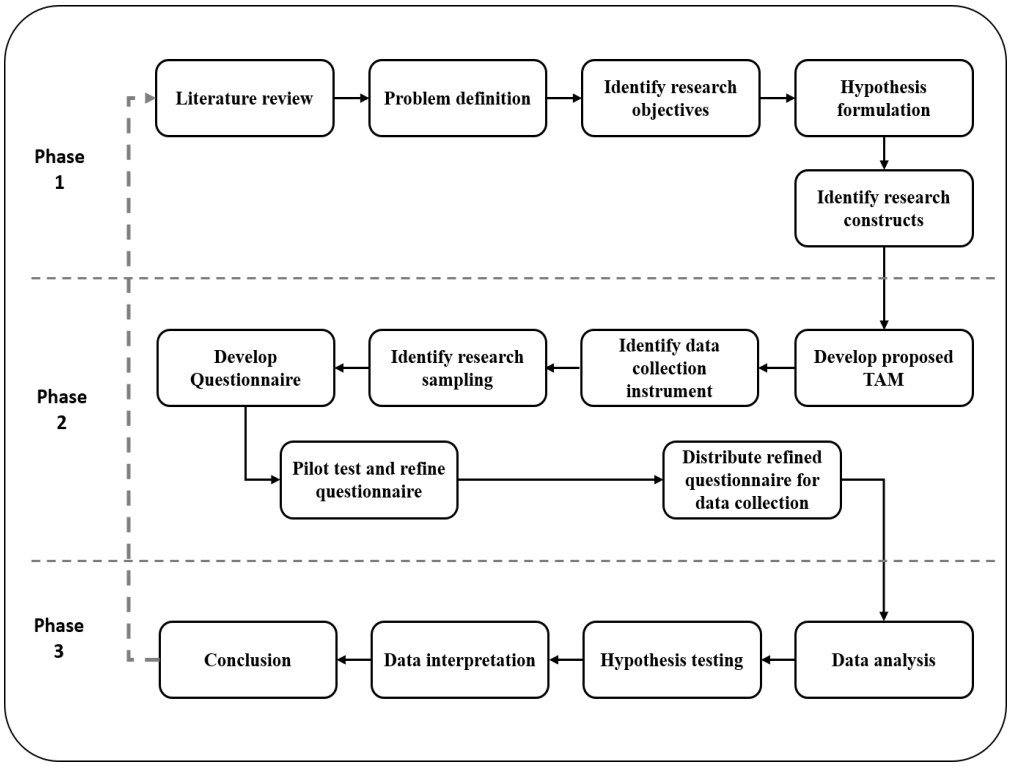

Figure 1.1: Research flow

This research encompasses three phases. In this first phase, relevant literatures are reviewed extensively and categorized into several topics. The outcomes from the literature review served as the base of the entire research. Following the literature review, specific problem statements were identified and translated into several research objectives. Hypotheses are being formulated based on the research objectives formed.

Second phase of this research is about the formation of the research methodology. In this stage, a TAM is developed by using Davis's TAM as the theoretical foundation with inclusive of additional construct identified through literature review in phase one. Data collection instrument and research samples are then identified. A structured self-administrated questionnaire is developed to evaluate the proposed TAM and validate research objectives. A preliminary

investigation is conducted among 15 students who resemble the research subjects. Reliability of the scale is tested, subsequently leading to the refinement of the questionnaire. Refined questionnaire is then disseminated to research samples for actual data collection.

In third phase, data collected from the survey is being analysed using SPSS program, both descriptive and inferential statistics were used. Statistical methods such as descriptive analysis, independent-sample t-test, One-way ANOVA (analysis of variance) were utilised to test hypotheses identified in section 1.3. The results of hypotheses testing are interpreted and are further discussed to draw out wider implications of the findings. Following that, a final concluding remark will wrap up the entire dissertation, at the same time ensuring all the research objectives have been met.

1.5 Research Significance

This research will be a significant endeavour in promoting effective asynchronous learning environment within the HEIs and motivation of students to utilise LMS in their study. Particularly, this research adds value to the attempts by Ministry of Education and the management of HEIs working on improving e-learning usage and effects among the students. Moreover, this research will be helpful to the management of UTAR in informing them the students' LMS usage behaviour. Meanwhile, this research also serves as a stimulus to evaluate the performance of their existing LMS system whether it is

realising its objectives. Besides, it also provide guideline to LMS designer on what criteria need to be considered during the development of LMS in order to cater to the needs of LMS users, which in turns initiates and promotes students' utilisation of LMS.

Additionally, this research will make valuable academic contributions to the technology acceptance literature for e-learning system in Malaysia. This research will also serve as a future reference for researches on the subject of technology acceptance. Understanding the effect of students' perceptions on their intention to adopt a technology and the factors that influence their perception leads to higher user acceptance of the technology. User acceptance determine the success of the system, is therefore a critical issue for the education sector. Nonetheless, the contributions of this research are not exclusive to the educational context, and should be of value to organisation in any sectors aiming to achieve better user acceptance of new and existing information technology.

1.6 Definition of Terms

This section defines several terms used in this research as follows:

- **Actual system use:** Actual system use is defined as "a form of external psycho-motor response that is quantified by individual users' real course of action" (Davis 1989 cited in Pan et al., 2005, p. 288).

- **Attitude toward the behaviour or act:** Attitude toward the behaviour or act: refers to individual's positive or negative feelings about performing a behaviour (Fishbein and Ajzen, 1975).
- **Behavioural intention:** Behavioural intention is "a measure of the strength of one's intention to perform a specific behaviour" (Fishbein and Ajzen, 1975, p. 288).
- **E-learning:** E-learning is defined as "instruction or learning experiences that are delivered via electronic technology such as internet, audio, videotape, satellite broadcast, interactive TV, and CD-ROM" (Imel, 2002, p. 3). The term of e-learning is further described in section 2.3.
- **Learning Management System:** Learning Management System or LMS is an e-learning platform that designed to support educational process, such as administrative process, course delivery and assessment (Kats, 2013). This term is further described in section 2.4.
- **Motivation to comply:** Motivation to comply is the degree to which an individual would like to act in accordance with the significance person's expectation (Sharma and Romas, 2011).
- **Normative belief:** Normative belief is belief about the extent to which significance person surrounding the individual think he or her should or should not perform a particular behaviour (Ajzen, 1991).

- **Perceived behavioural control** referred to the person's belief as to how easy or difficult to execute a behaviour, which is determined by the availability of skills, resources, and opportunities to perform the behaviour (Masrom and Hussein, 2008).
- **Perceived ease of use:** Perceived ease of use is "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989, p. 320). The term perceived ease of use will be further described in section 2.6.
- **Perceived usefulness:** Perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320). The term of perceived usefulness is further described in section 2.6.
- **Subjective norm:** Subjective norm refers to "perceived social pressure to perform or not to perform the behaviour" (Ajzen, 1991, p. 188). These people may include friends or a peer group, family, co-workers, church congregation members, community leaders and even celebrities. The term of subjective norm is further described in section 2.7.

1.7 Summary

This research adopted Davis's TAM as the grounded model theory for the proposed TAM to investigate students' perception toward WBLE, and to

determine factors that affect their perception and usage of WBLE. WBLE is a web based learning management system designed to facilitate learning and teaching process among students and lecturers in UTAR, however, it was not fully utilised by the students. Seven hypotheses were formulated to validate the effects of research constructs built into the proposed TAM on students' acceptance of WBLE and their behavioural intention to use WBLE in their study. The findings of this research could provide guidelines for existing system enhancement or future information system project implementation in HEIs.

1.8 Dissertation Structure

Chapter 2 reviews the literature on theories, models and concepts which are related to this research. It covers Malaysian higher education system, e-learning, learning management system, user acceptance of system use, user acceptance theoretical models and related past studies. Through the literature review, the proposed TAM model is developed and is presented in this chapter.

Chapter 3 discusses the research methodology used in this research. It includes topics such as research methods, research samples, research instrument, data collection procedure, and data analysis techniques.

Chapter 4 presents the research findings of data analysis which include the findings of data analysis on the respondent demographics, the findings of

data analysis on the actual usage of WBLE, and the findings of hypotheses testing. The data is analysed using SPSS. Both descriptive and inferential statistics were used in the data analysis.

Chapter 5 wraps up the discussion of this research. It also highlights the research contributions, limitations involved in this research with recommendations for further research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter presents the review of extant literature on theories, models and concepts related to this research which encompasses the following topics: Malaysian higher education system, e-learning, learning management system, user acceptance theoretical models, and related past studies.

2.2 Malaysian Higher Education System

Higher education in Malaysia is handled by the Ministry of Higher Education which was founded on 27 March 2004. There are 20 public universities, 33 private universities and university colleges, 4 foreign university branch campuses, 22 polytechnics, 37 community colleges and about 500 private colleges existed in Malaysia. “MOHE mission is to create a higher education environment that will foster the development of academic and institutional excellence” (MOHE, 2009).

To attain this mission, Malaysian government has invested a lot on e-learning initiatives into the country (Kamaruddin et al., 2009). E-learning

initiatives in Malaysia are being undertaken mainly by universities, colleges and business enterprises (Ali, 2004). According to Hamid and Anwar (2007), in late 2004, almost 80% of the HEIs in Malaysia has implemented e-learning system. Several successful HEIs in providing e-learning are Open University Malaysia (OUM), Multimedia University (MMU), University Tunku Abdul Razak (UNITAR) and Universiti Malaysia Sarawak (UNIMAS).

UTAR is one of the HEIs, which was officially launched in Malaysia on 13 August 2002. It has four thriving campuses, which are situated in Kampar, Petaling Jaya, Kuala Lumpur and Bandar Sungai Long. Students will be based at one of the campuses depending on their choice of programme. UTAR vision is to be a global university of educational excellence with transformative societal impact. To attain this vision, UTAR has outlined 11 goals in carrying out its mission. One of the goals is to promote the use of ICT and IT-intensive learning through innovative courses and learning support systems (UTAR, 2013). This initiative can be seen through the implementation of its web-based learning management system, which is called WBLE.

2.3 E-Learning

The term e-learning was coined in the mid-1990s along with developments in the World Wide Web and interest in asynchronous discussion groups (Garrison, 2011). It was introduced in Malaysia in 1998. HEIs were the

early adopter of the concept of web-based teaching and learning due to the availability of ICT resources, funds, and personnel (Mohamad et al., 2005).

Ever since the introduction of e-learning, it has gradually becomes an important facilitator in teaching-learning process. Its popularity isn't showing any signs of slowing. In fact, e-learning is a worth $56.2 billion industry in 2013 which would going to double up, hitting $107 billion by the year of 2015 (Pappas, 2013; Virtual College, 2012). Malaysia has the most rapidly growing e-learning markets, at the record of 39.4%, which is more than four times the worldwide aggregate growth rate (Pappas, 2013; Sawahel, 2013).

Clark and Mayer (2011) defined e-learning as the use of computer to deliver instruction by way of CD-ROM, internet or intranet. The technological foundation of e-learning is the Internet and associated communication technologies (Garrison, 2011). E-learning assists organisations build job-transferable knowledge and skills for performance improvement or to assist individual to achieve educational goals. Clark and Mayer further noted that, e-learning involves the use instructional methods (such as examples and practice) and multimedia elements (such as pictures and videos) to assist learning by delivering content which is pertinent to the learning objective. With e-learning, students and lecturers are able to interact with each other using IT tools and applications (Nordin et al., 2011).

E-learning exists in synchronous form and asynchronous form. In synchronous e-learning, students and instructors meet at a predetermined time

for an instructor-led session (Rosen, 2009). This may include video conferencing, real-time chatting and phone conferences (Gopal and Singh, 2009). In asynchronous e-learning, students use material made available through the Web, which they can access it anytime and anywhere (Rosen, 2009). This mode of e-learning includes taking a self-paced course, posting course related messages to a discussion group and exchanging email messages with instructor (Gopal and Singh, 2009).

According to Ismail (2002), there are a few types of e-learning systems, including Learning Management System (LMS), Learning Content Management System (LCMS) and Learning Design System (LDS). LMS focuses on delivering learning content, tracking learners' progress and assessing learners' performance (Harman and Koohang, 2007). In contrast, LCMS focuses on the development, management and publishing of online content that will be delivered via LMS (Prasad, 2012). An LDS enables content developers to analyse and design the complete structure of the instructionally sound learning programmes (Ismail, 2002).

This research focuses on LMS, which is an e-learning system using by UTAR called WBLE. WBLE is an asynchronous e-learning platform in which UTAR students are able to access the website at their convenience. Through WBLE, students are able to download course materials, post messages to forum for online discussion, participate in online learning, and more are discussed in further detail in section 2.4.

2.4 Learning Management System

A Learning management system (LMS) is a platform that support multiple facets of an educational process, from administrative functions to course delivery and assessment (Kats, 2013). Other terms used for this system are Course Management Systems (CMS) and Virtual Learning Environment (VLE) (Hamat et al., 2011). It is now common to find LMS within HEIs to supplement traditional classroom teaching (Hamat et al., 2011; Smith, 2010). Among the key factors that popularize the usage of LMS are cost effective and basic skills required to use it (Hamat et al., 2011).

LMS enabled new method of supervising student teaching both in synchronous and asynchronous forms (Stanislawski, 2008). Through LMS, instructors are able to create and manage educational courses quicker and easier, exchange information with students over the network, engage students in online discussion via forum and also assess student performance (Ahmad et al., 2010; Bruning et al., 2003; Chang, 2008). LMS provide the students with ability to access lecture notes, and use communication and interactive features in their learning activities (Almarashdeh et al., 2011)

Popular providers of LMS available in the market, include Moodle, Blackboard and WebCT (Francis, 2013). Among these providers, Moodle is the most prevalent provider adopted by HEIs to create their online dynamic web sites because it is free and can be modified to cater the need of institution (Hamat et al., 2011; Moodle, 2013). To date, there are 270 registered Moodle

sites in Malaysia. Some of the sites hosted by HEIs are Curtin University branch in Malaysia (http://moodle.curtin.edu.my/), Universiti Tenaga Nasional (http://lms.uniten.edu.my/moodle/) and Wawasan Open University (https://lms.wou.edu.my/) (Moodle, 2014).

Though each LMS has its own interface and features, there are common features that appear in most systems. These features include resources, discussion/forum, chat, news, grades, calendar, course home, dropbox/ assignment, quizzes, and survey (Ahmad et al., 2010; Francis, 2013; Mendes-Neto and Brasileiro, 2007). As shown in Figure 2.1, Hamat et al. (2011) indicated that the LMS features often used by students were Searching within Course (40.1%), Assessment (39.7%), and Course Management (39.1%).

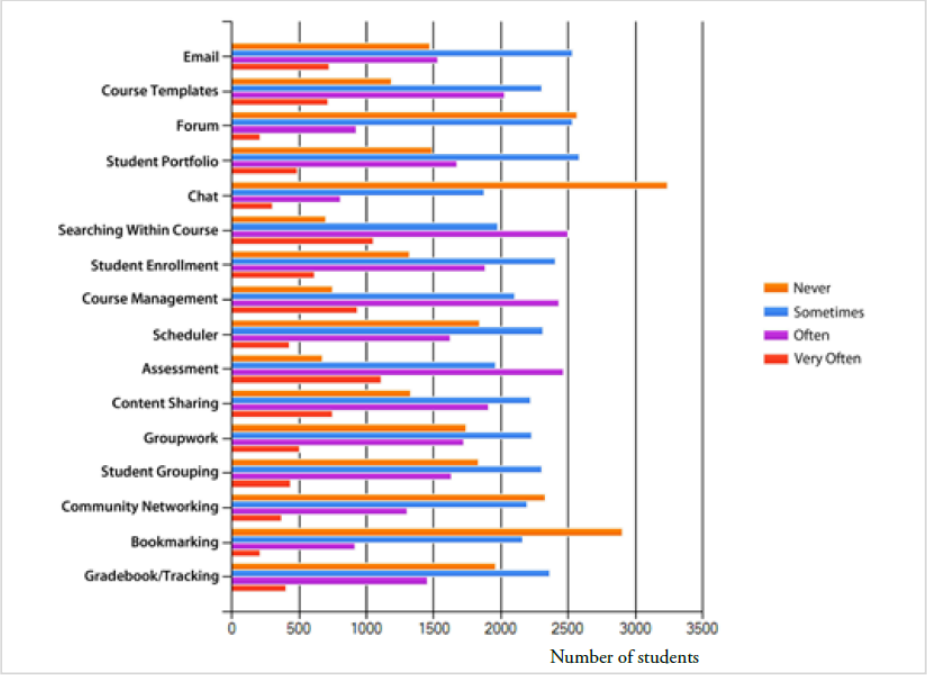

Figure 2.1: Components of the LMS most frequently accessed by the student

Source: Hamat et al. (2011, p.43)

In UTAR, a web-based LMS was developed using Moodle which was designed to supplement the teaching-learning process and achieve better learning outcomes. It is called WBLE (Web-Based Learning Environment) which can be accessed at http://wble.utar.edu.my. WBLE is serving as a communication tool between lecturers and students across four campuses located at Kampar, Petaling Jaya, Setapak and Sungai Long since 2005. Figure 2.2 illustrates a sample screenshot from the campus selection page in WBLE.

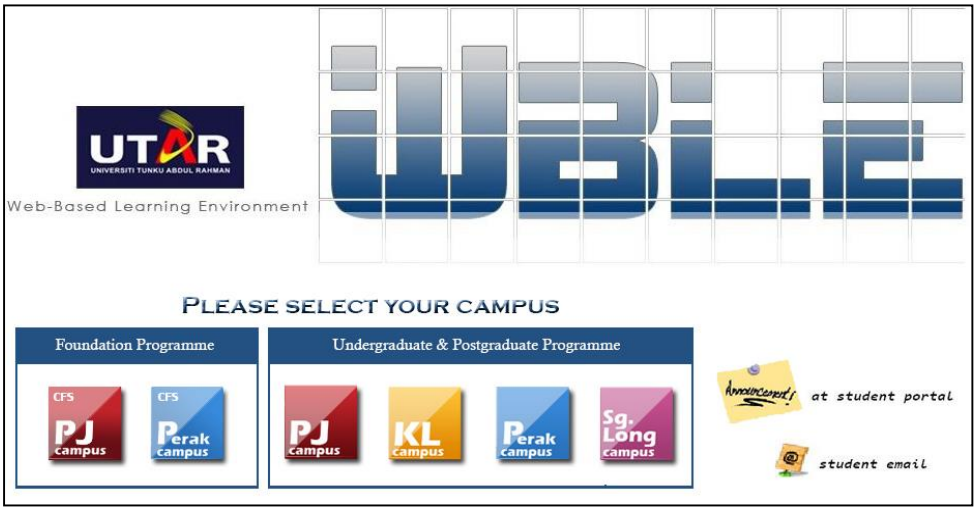

Figure 2.2: Sample screenshot from the login page of WBLE

There are several main features integrated in WBLE as follows:

- **Course Resources (for instructional materials management):** This feature as shown in Figure 2.3 enables a lecturer to upload and store instructional materials that are related to a course such as lecture notes, tutorial questions, assignments, and so forth for students to download.

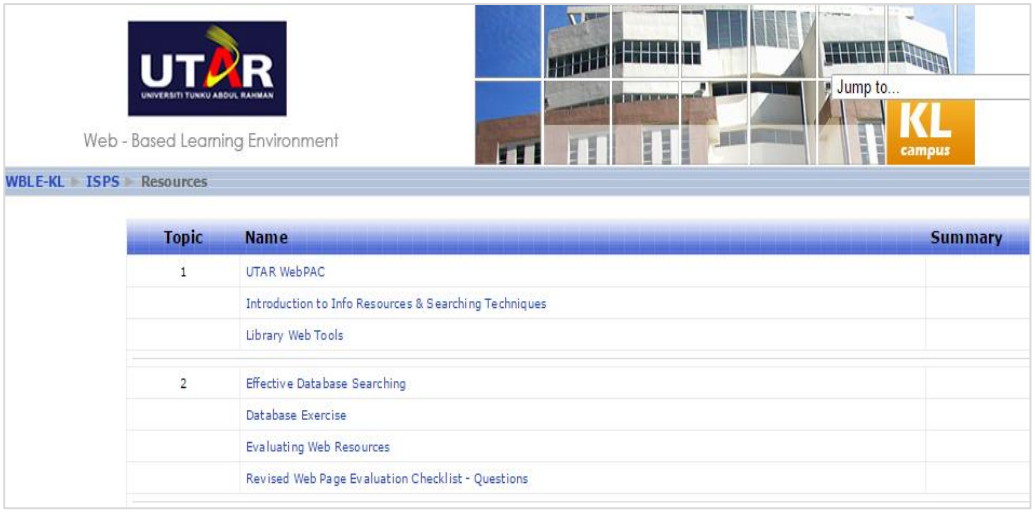

Figure 2.3: Sample screenshot from WBLE showing the Course Resources feature

- **Announcement:** It enables a lecturer to post or update latest academic news or upcoming events.
- **Grades List:** This feature as shown in Figure 2.4 enables students to keep track their scores and feedback of assignments/ quizzes provided by a lecturer.

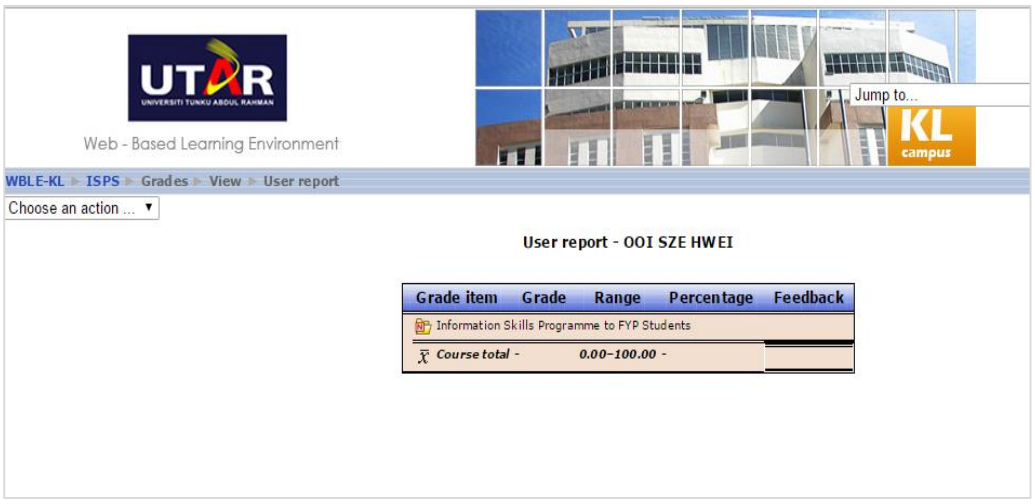

Figure 2.4: Sample screenshot from WBLE showing the Grade List feature

- **Personal Profile and Blog:** Figure 2.5 shows this feature which enables students and lecturers to share their personal thoughts.

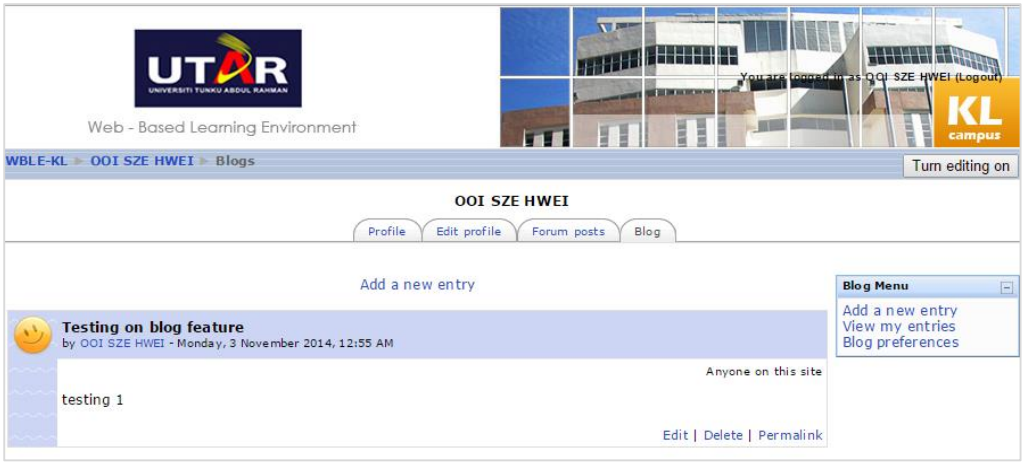

Figure 2.5: Sample screenshot from WBLE showing the Personal Blog and Profile feature

- **Chat:** The Chat feature as depicted in Figure 2.6 provides an area where students and lecturers can engage in live discussions (synchronous communication).

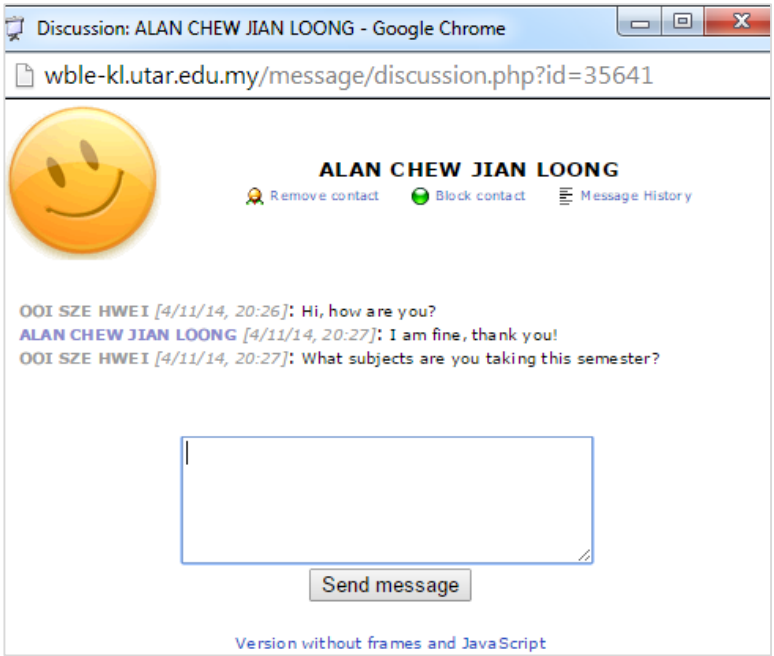

Figure 2.6: Sample screenshot from WBLE showing the Chat feature

- **Forum:** The Forum feature as revealed in Figure 2.7 serves as a platform where students and lecturer can engage in online discussions (asynchronous communication).

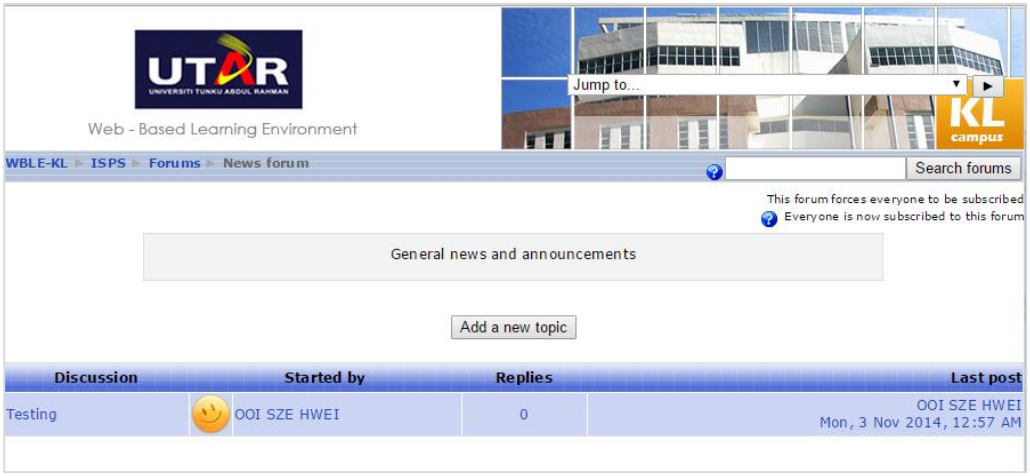

Figure 2.7: Sample screenshot from WBLE showing the Forum feature

- **Calendar:** Calendar feature is integrated in the Upcoming Events section where students could keep informed with latest academic news or upcoming events posted by lecturers like assignments submission date, examination date, and all sort of academic related notifications.

2.5 User Acceptance of System Use

With growing reliance on technology and increasing failures of IT adoption, user acceptance of technology has been an important field of study. It is of high interest for both researchers and practitioners to predict whether new technologies will be accepted by the target group or not.

Dillon and Morris (1996) defined user acceptance as "the demonstrable willingness within a user group to employ IT for the tasks it is designed to support" (p. 4). It is an issue which will impact on the success of the information system (Peterson and Peterson, 1999).

Fay (2007) indicated that an important concern in end-user mind is not whether the system is function properly, but whether the system is addressing their needs, supporting their objectives and operate in the way they are expecting. System that does not cater the needs of user leads to low acceptance. Meschtscherjakov et al. (2009) emphasised that a lack of acceptance will lead to a rejection of the system by new users and to a strong dislike by existing users of comparable technology, who have a high intention on using newer developments

Citing Islam et al. (2011), Maurer (2001) emphasized that e-learning can be effective in improving students' learning performance, but its effectiveness depends upon if the platform is used properly and correctly by the students. Maurer further explained that the purpose of providing e-learning is to improve students' achievement instead of to provide state-of-the-art equipment for its own sake. Apparently, if the system of high technical performance not accepted and adopted by the user will be good for nothing (Davis, 1989). Thus, it is necessary to assess the barrier to the acceptance of e-learning system as the success of it depends largely on students' acceptance and the usage by the students themselves.

2.6 User Acceptance Models

There are several theoretical models which have been widely used to understand various factors influencing the user acceptance of an information technology. These models include Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM). Figure 2.8 illustrates the basic conceptual framework underlying the class of models explaining the individual acceptance of information technology.

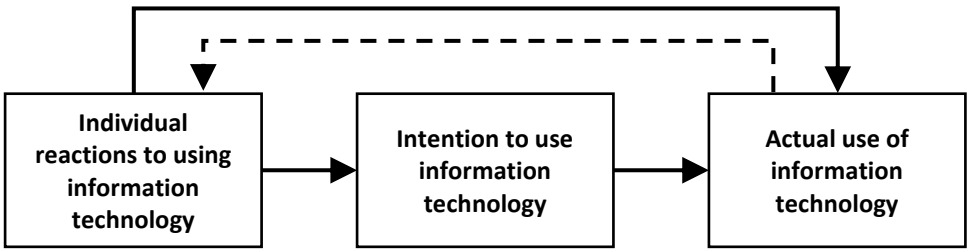

Figure 2.8: Basic concept underlying user acceptance models

Source: Venkatesh et al. (2003, p. 427)

2.6.1 Theory of Reasoned Action

Theory of Reasoned Action (TRA) was proposed by Fishbein and Ajzen (1975, cited in Masrom and Hussien, 2008) to study how an individual decide to perform a certain behaviour. Figure 2.9 illustrates the TRA model.

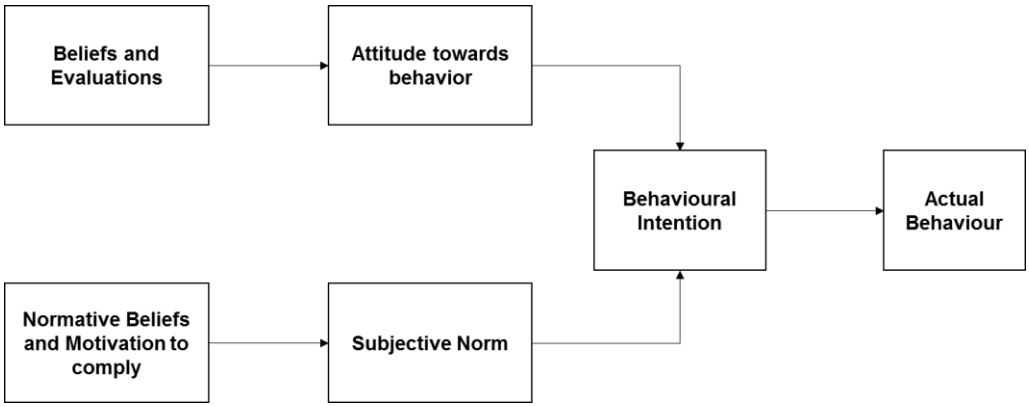

Figure 2.9: Theory of Reasoned Action model

Source: Davis et al. (1989, p. 984)

The theory posits that behavioural intention precedes an individual volitional behaviour and is determined by his or her attitude towards the behaviour and subjective norm surrounding the performance of the behaviour. Thus, TRA can be summarised by the following equation (Masrom and Hussein, 2008):

Behavioural Intention (BI) = Attitude towards Behaviour (A) + Subjective Norm (SN)

TRA based on the assumption that individual will usually act upon their intention (Masrom and Hussein, 2008). Intention is assumed to "capture the motivational factors that influence a behaviour, they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behaviour" (Ajzen, 1991, p. 181). According to Raoprasert and Islam (2010), the stronger the intention to engage in the behaviour, the greater chance of the individual is more likely to perform. Raoprasert and Islam added, the intention to engage in a specific behaviour is determined by a person's attitude towards the behaviour and subjective norm.

As can be perceived through Figure 2.9, the variable ‘attitude towards behaviour’ is influenced by beliefs and affective evaluation about the consequences arising from a behaviour. Whereas subjective norm is based on two components as below (Ajzen, 1991; Sharma and Romas, 2011):

- normative belief: belief about whether significance person surrounding the individual would like or expect him or her to perform a certain behaviour, and
- motivation to comply: the degree to which an individual would like to act in accordance with the significance person’s expectation.

TRA has been widely applied to the area of social psychology to predict and understand a wide range of behaviours, for instance, physicians’ intentions to measure BMI in children and adolescents (Khanna et al., 2009); intention to engage in early sexual behaviour among African American young teen girls (Doswell et al., 2011); intention to engage in dietary behaviours associated with obesity and chronic disease risk (Tull et al., 2013); cyber bullying perpetration among college students (Doane et al., 2014). The outcomes of these studies suggested that TRA is able to support the behaviour prediction. Table 2.1 depicts the summary of TRA used in the past studies.

Table 2.1: Summary of TRA used in the past studies

Setting	Research Samples	Source
Predictors of cyberbullying perpetration among college students	374 University students in South-eastern Virginia.	Doane et al. (2014)
Prediction of early sexual behaviour among African American young teen girls	204 aged 11-14 healthy middle-school African American girls	Doswell et al. (2011)
Physicians' intentions to measure BMI in children and adolescents	622 Family physicians and paediatricians practicing in Alabama, Colorado, Massachusetts, and West Virginia.	Khanna et al. (2009)
Intention to engage in dietary behaviours associated with obesity and chronic disease risk	183 aged 18-55 years women in Barbados, West Indies.	Tull et al. (2013)

2.6.2 Theory of Planned Behaviour

An important assumption of TRA as originally proposed is that the behaviour to be predicted must be under volitional control. Because few behaviours are under complete volitional control, however, this assumption places serious limitations on the range of behaviours encompassed by the theory. To remedy this limitation, Ajzen (1985) added the antecedent of intention to the model of TRA i.e. Perceived Behavioural Control (PBC) and named this revised theory as Theory of Planned Behaviour (TPB) as shown in Figure 2.10.

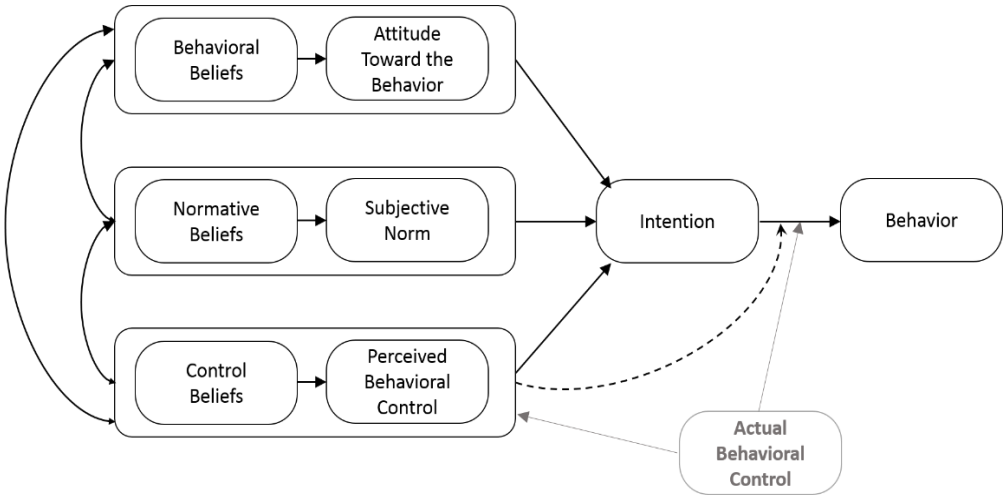

Figure 2.10: Theory of Planned Behaviour model

Source: Ajzen (2006)

The TPB model as revealed in Figure 2.10 is an extended model of TRA. PBC refers to the person's belief as to how easy or difficult to execute a behaviour, which is determined by the availability of skills, resources, and opportunities to perform the behaviour (Masrom and Hussein, 2008). According to TPB, attitude, subjective norm and PBC together formed an individual behavioural intention. Whilst, perceived behavioural control also found to be directly influenced individual actual behaviours (Gochman, 1997).

Some studies (e.g. Booth et al., 2014; Watanabe et al., 2014; Zhou et al., 2009) had exhibited the superiority of TPB model in predicting behaviour. In addition, Chang (1998); Roberto et al. (2014), Ryu et al. (2003), and Zint (2002) proved that TPB has outperformed TRA in predicting unethical behaviour among university students, predicting substance-abuse treatment providers' communication with client about medication assisted treatment, explaining intention to share knowledge among physicians in hospitals and predicting

science teachers' intentions to incorporate environmental risk education respectively. Table 2.2 reveals the summary of TPB used in the past studies.

Table 2.2: Summary of TPB used in the past studies

Setting	Research Samples	Source
Understanding perceived need for treatment among African-American cocaine users	400 not-in-treatment African-American cocaine users.	Booth et al. (2014)
Comparing TRA and TPB in predicting unethical behaviour (i.e., illegal copying of software)	181 students from several Hong Kong universities.	Chang (1998)
Comparing TRA and TPB in predicting whether substance-abuse treatment providers encourage their clients to use medicated-assisted treatment as part of their treatment plan	210 substance-abuse treatment providers with average aged of 48 and 14 years of substance abuse treatment experience.	Roberto et al. (2014)
Comparing TRA and TPB in explaining physicians' intentions to share knowledge within a hospital department	286 physicians practicing in 28 types of subunits in 13 tertiary hospitals in Korea	Ryu et al. (2003)
Assessing Intentions to Eat Low-Glycemic Index Foods by Adults with Diabetes	431 participants recruited through presentations at hospital-based diabetes education programs, weight management clinics, regional diabetes events, and advertisements distributed by the Alberta Diabetes Foundation and local media.	Watanabe et al. (2014)
Investigating the effects of age, gender and conformity tendency on Chinese pedestrians' intention to cross the road in potentially dangerous situations	426 adults, aged 18–81 years from Beijing.	Zhou et al. (2009)
Comparing TRA, TPB and Theory of Trying to predict science teachers' intention to incorporate environmental risk education	1336 Grade 6-12 science teachers from Michigan, Ohio, and Wisconsin Departments of Education.	Zint (2002)

2.6.3 Technology Acceptance Model

Technology Acceptance Model (TAM) is an adaptation of the TRA to the field of information system which aims to accurately model how users respond to the presentation of a new technology, addressing factors such as their initial perception, level of acceptance and use of the technology. Davis (1986, cited in Masrom and Hussein, 2008) first proposed the TAM to trace the impact of external variables on internal beliefs, attitudes and intentions to accept and use a computer-based technology.

According to TAM as can be perceived through Figure 2.11, user acceptance of any technology is measured by a person's behavioural intention to use the technology. Behavioural intention to use a system is determined by the user's attitude towards using the system and the belief of using the system would enhance his or her job performance (perceived usefulness). Attitude towards target system use is directly affected by two distinct constructs, perceived usefulness (PU) and perceived ease of use (PEOU). In addition, PEOU found to have a direct impact on PU. Behavioural intention directly affects actual system use. Actual system use is a behavioural response measured by the individual's actions in real life. Frequency of use and amount of time spent using a target system is typical of the usage metrics (Davis, 1993 cited in Pan et al., 2005).

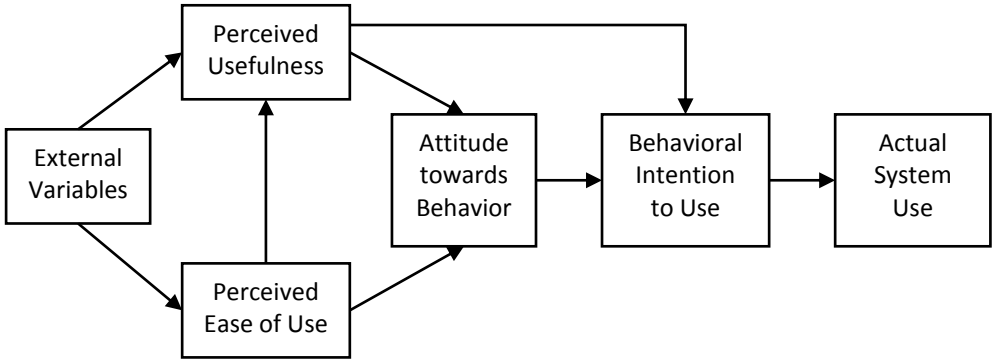

Figure 2.11: Technology Acceptance Model proposed by Davis

Source: Davis (1989 cited in Masrom and Hussein, 2008, p.52)

TAM appears particularly effectiveness due to its identification of two user acceptance constructs: PU and PEOU, which simplified previous theoretical attempts to measure attitudes towards technology. Thus, TAM has been applied as a reliable and robust model for predicting the user adoption of different technologies, include but not limited to predicting e-commerce purchasing intention (Maditinos et al., 2007); investigating intention to use Decision Support System (DSS) within medium and large business organisations in Croatia (Dulcic et al., 2012); predicting tablet computer use among residents or physicians in pediatrics or medical-pediatrics in the United States (Ducey, 2013).

TAM has also been successfully used to explore issues such as the influence of gender, age, income, ethnic group upon technology acceptance (e.g. Abbad et al., 2011; Teo et al., 2008; Venkatesh and Morris, 2000; Wong et al., 2012; Yi et al., 2006). Apart from that, TAM also has the potential to offer considerable insight into the nature of user acceptance toward a virtual learning environment within the context of higher education. Thus far, Chang

and Tung (2008), Premchaiswadi and Porouhan (2012), Punnoose (2012), Theng et al. (2008), and Zhang et al. (2008) are exploring TAM within the context of students as users to their acceptance of particular aspects of the web based learning environment. Table 2.3 presents the summary of TAM applied in the past studies.

Table 2.3: Summary of TAM used in the past studies

Setting	Research Samples	Source
Investigates and identifies some demographic (e.g. gender, age, income and computer ownership) factors affecting students' adoption of an e-learning system.	470 undergraduate students taking first basic computer literacy classes at the Arab Open University (AOU) in Jordan.	Abbad et al. (2011)
To examine the influence of technological factors considered from the technology acceptance model (TAM) to understand the adoption of knowledge management (KM) systems	352 employees of the public sector organisations of Saudi Arabia.	Alatawi et al. (2014)
To study students' behavioural intentions to use the online learning course websites.	212 undergraduate students who were using the online learning course websites in Taiwan.	Chang and Tung (2008)
To identify if a relationship exists between a user's perceived usefulness, perceived ease of use and subjective norm on the user's intention to operate this technology.	21 radiographers randomly selected from a health care facility utilizing a computed radiography system.	Cowen (2009)
Predicting tablet computer use	Current residents or physicians in pediatrics or medical-pediatrics in the United States.	Ducey(2013)
Investigating intention to use Decision Support System (DSS) within medium and large business organisations in Croatia	156 companies from different industries within 10 territorial subdivisions of the Republic of Croatia.	Dulcic et al (2012)

Table 2.3 (Continued)

Setting	Research Samples	Source
Comparing TRA, TPB and TAM to explain buyer behavioural intentions toward shop-bots	199 (TRA), 198 (TPB), 200 (TAM) undergraduate students from introduction-to-marketing class at a major public university.	Gentry and Calantone (2002)
To examine factors that influence students' intentions to take online courses.	140 college students at a Midwestern university in the United States and 226 students at two different universities in South Korea.	Grandon et al. (2005)
Predicting e-commerce purchasing intention	Aged 18-44 years old internet users residing in a city of northern Greece, Kavala.	Maditinos et al. (2007)
To analyse the relationship of university students' intention to use e-learning with selected constructs	628 university students in Korea.	Park (2009)
To investigate the underlying factors that influence students' intention to use an e-learning system.	86 undergraduate and graduate students who have ever used e-learning educational system at one of Bangkok universities in Thailand.	Premchaiswadi and Porouhan (2012)
To find some of the predominant factors that determine the intention of students to use eLearning in the future	26 different countries with the majority of the respondents (83%) residing in Thailand during their study.	Punnoose (2012)
Testing the viability of TAM in multimedia learning environment.	362 students who were taking a 300 level core management information systems course at Concordia University in Montreal, Canada.	Saad é et al., (2007)
Explore pre-service teachers' self-reported future intentions to use computers in Singapore and Malaysia.	250 and 245 pre-service teachers in Singapore and Malaysia respectively and all of them owned a computer at home.	Teo et al. (2008)

Table 2.3 (Continued)

Setting	Research Samples	Source
Investigate the factors leading to perceived usefulness, perceived ease of use and behavioural intention to use the e-learning system	51 students from a local university using edveNTUre, a proprietary e-learning system powered by Blackboard.	Theng et al. (2008)
Investigate gender differences in the context of individual adoption and sustained usage of technology in the workplace	445 individuals from five organisations	Venkatesh and Morris (2000)
Explore the role of gender and computer teaching efficacy on the intention of student teachers to use computers	302 student-teachers from the Sultan Idris Education University (UPSI) in Malaysia.	Wong et al. (2012)
To incorporate individual differences (e.g. gender, age, personal innovativeness, computer experience) into TAM and examine the two effects simultaneously	88 second-year undergraduates of the business school in a local university	Yi et al. (2006)
Comparing TRA, TPB and TAM in explaining internet banking behaviour	441 internet banking users of Halifax Bank.	Yousafzai et al. (2010)
Extended TAM to understand of user behaviour towards online learning systems.	121 students from business college located in a south-central province.	Zhang et al. (2008)

2.6.4 Proposed User Acceptance Model

Since both TPB and the TAM are extended theories derived from TRA, it is expected that these two theories have more accurate predictive capability than the TRA. However, the concept of the TAM is slightly different from the TPB as TAM has a clearer focus on technology acceptance behaviour of

computer users rather than being a generic model for individual behaviour in social environment. Bradley (2012), who explored the development, use and status of TAM had noted that TAM has been the most widely adopted theory to explore user acceptance of an information system.

Gentry and Calantone (2002) and Yousafzai et al. (2010) had revealed that TAM has outperformed TPB and TRA in explaining behavioural intention to adopt a specific technology. The researchers from both studies believed that TAM outperform TRA and TPB due to TAM's use of two specific beliefs (i.e., PU and PEOU) which can be applied to any technology acceptance context. In contrast, TRA and TPB stipulate that factors influencing attitudes are unique for each situation which require researchers to "reinvent the wheel" with each situation.

In addition, the findings in Park (2009) and Saadé et al., (2007) studies proved TAM to be a good theoretical model in understanding user acceptance of e-learning context. Hence, this research is adopting the core-ideas of Davis's TAM model (as illustrated in Figure 2.11) to develop the proposed TAM (see Figure 2.12) with arrows representing causal relationships, for investigating the user acceptance of WBLE, an LMS used in UTAR.

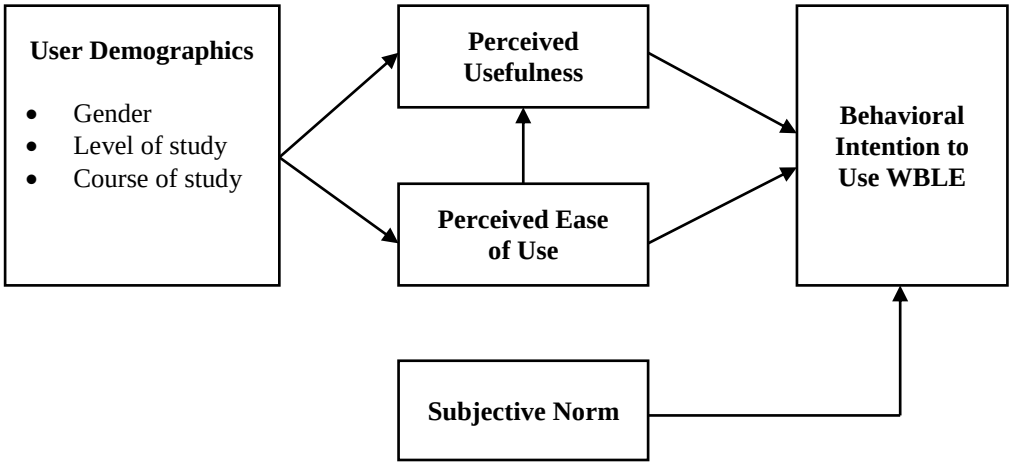

Figure 2.12: Proposed Technology Acceptance Model (Adapted from Davis's TAM)

According to this model, the behavioural intention to use (BITU) WBLE is a function of three concrete behavioural beliefs:

- Perceived usefulness (PU): the degree to which a student believes using WBLE would enhance his or her learning process,
- Perceived ease of use (PEOU): the degree to which WBLE is regarded as easy to understand and operate, and
- Subjective norm (SN): students' perception of whether significance individuals such as their peers and lecturers think the he or she should use WBLE.

Further, student demographics such as gender, level of study and course of study have been identified as external variables that may influence PU and PEOU and thus affect behavioural intention to use (BITU) WBLE.

2.7 Perceived Usefulness, Perceived Ease of Use and Behavioural Intention to Use

According to Davis (1989, p. 320), Perceived Usefulness (PU) is "the degree to which a person believes that using a particular system would enhance his or her job performance". Items that measure PU includes productivity and time savings, job effectiveness, control over work, and the importance of the system to one's job. Farmani et al. (2012) indicated that the more improved performance in organisational context due to using the system, they are considered more useful and they will be used more.

Whilst, Davis (1989, p. 320) noted that Perceived Ease of Use (PEOU) is referred to as "the degree to which a person believes that using a particular system would be free from effort". Scale items that measure PEOU includes the physical effort and mental effort to learn to use the system. The less effort is needed for learning and using the systems, the more they would be used (Farmani et al., 2012). Citing Davis (1989), according to Nikerson (1981) and Roberts and Moran (1989), memorising how to perform tasks by referring to the user manual and relying on system guidance are all phenomena associated with the process of learning to use a new system.

Suki and Suki (2011) noted that behavioural intention to use (BITU) is a measure of the likelihood that a person will adopt the application. It predicts an individual's actual system use of acceptance of computer related technology. Past studies such as Alatawi et al. (2014), Chang and Tung (2008), Premchaiswadi and Porouhan (2012), and Theng et al. (2008) had found that

PU and PEOU to have a direct significant influence on behavioural intention to use knowledge management system, online learning course websites, and e-learning respectively.

2.8 Subjective Norm

Subjective norm (SN) is referred to as "perceived social pressure to perform or not to perform the behaviour" (Ajzen, 1991, p. 188). In the case of using an e-Learning system, an individual may believe that most people who are important to him think that he should use the system or he may believe that they think that he should not. Many researchers have replicated, extended, and utilised TAM, however, there are some aspects which remain unclear, which is SN has had a mixed and inconclusive role.

SN was dropped from the original TAM as when Davis (1989) found that the correlation between subjective norm and behavioural intention is not significant. Studies by Cowen (2009) and Ducey (2013) further confirmed the concept of Davis, reporting that SN has no effect on BITU. However, it later added to TAM2 where Venkatesh (2000) claimed that subjective norm influences intention indirectly through perceived usefulness in voluntary compliance implementations.

While in the context of education, the studies of Farahat (2012), Grandon et al. (2005), Park (2009), Premchaiswadi and Porouhan (2012) and

Punnoose (2012) reported that subjective norm is a significant factor in affecting university students' intention to engage in e-learning. Many TAM studies tended to focus on instrumental beliefs such as perceived usefulness and perceived ease of use as drivers of usage intentions, with technology characteristics as major external stimuli. Behavioural sciences and individual psychology, however, suggest that social influences are also potential significant determinants of adoption or may be a more important element in their adoption decisions (Lu et al., 2005).

Given the inconsistent findings in relation to the effect of SN on BITU in the past studies (e.g. Alatawi et al., 2014; Farahat, 2012; Grandon et al., 2005; Park, 2009; Premchaiswadi and Porouhan, 2012; Punnoose, 2012), this research intends to find out whether there is any significant relationship between SN and students' intention to use WBLE in their studies.

2.9 Related Studies

This section discusses some of the past studies related to user acceptance of a system using TAM. It also presents several related works on the relationship between PU and PEOU and the influences of these two beliefs on BITU, so as the influence of user demographics on PU and PEOU.

2.9.1 Related Studies on the Investigation of User Acceptance of a Technology Using TAM

As discussed in section 2.6.3, TAM has been used in various research predicting the user adoption of different technologies. This section discusses past studies which have applied TAM in the tertiary context, in particular user acceptance of e-learning or LMS, ether in abroad (e.g. Farahat, 2012; Park, 2009; Sharma and Chandel, 2003) or Malaysian context (e.g. Almarashdeh et al., 2010, 2011; Baleghi-Zadehh et al., 2014).

2.9.1.1 Applying the Technology Acceptance Model to online learning in the Egyptian universities

Farahat's (2012) research involved the population of Mansoura University students to investigate the factors that influence their intentions to use online learning. Motivation of the research derived from the reluctance of students to practice online learning. Farahat contended that the information gathered in his study might provide important information to the management and development of online learning programs in enhancing the effectives' of online learning and increment in its attractiveness.

Farahat had adopted the TAM as the underlying theoretical framework for his research's methodology. A structured questionnaire consisted of 42 items to measure five constructs of the research model was developed based on similar instrument from previous studies. Content validity was established based on the opinion of two experts in the field of e-learning. Reliability test

was established by piloting the questionnaire on a sample of 17 third year students of Damietta Faculty of Education. Finalized questionnaire was distributed to 153 students who were selected using purposive sampling method as they were the student who used online learning in studying the e-course “Instructional Technology”.

Farahat hypothesized that social influence (SI) of the students’ referent group, perceived usefulness (PU), perceived ease of use (PEOU) and attitude (ATT) would all correlate positively to the students’ intention to learn online. SI is the strongest determinant of the intention and has positive relationships with students’ PEOU, PU and ATT. While PEOU also positively influence PU of online learning. The results from Pearson Correlation and Multiple Regression Analysis proved some but not all of the hypotheses were true. Social influence was not the largest predictor to students’ intention to learn online. In addition, PU had shown a stronger effect than PEOU on students’ ATT to learn online.

Farahat discovered that students of Mansoura University in Damitta tend to have negative attitudes towards using online learning. Students do not perceive that online learning is useful, easy to use and is not intend to learn through online. Farahat suggested that this may attributed to insufficient skills possess to learn online, lack of supportive from the significant peers like instructors and families to adopt this technology. The findings strongly support the appropriateness of its proposed TAM to understand students’ acceptance of online learning. Farahat suggested larger sample with longer experience in

online learning should be used in replicated research. Additional research should also be conducted to study the influence of each category of students' referent group, such as instructor, on their intention to learn online.

2.9.1.2 An analysis of the Technology Acceptance Model in understanding university students' behavioural intention to use e-learning

Park (2009) focused explicitly upon the intent to engage in a web based learning environment among Korean university students. This research evaluated the utility of TAM within a different context from the Western education system. There were several research objectives. First, the research aimed to identify relationships between student characteristics, such as attitude and perceived usefulness, to the student's intention to participate in e-learning. Second, the research also sought to collect data that would help universities to develop more effective models for e-learning and the delivery of content within a web based learning environment.

Park also adopted TAM as the underlying theoretical framework and extended the model by including constructs like e-learning self-efficacy, SN, and system accessibility, PU, PEOU, attitude, and behavioural intention to use e-learning. The research population consisted of 650 undergraduate students enrolled at the Seoul Campus of Konkuk University. This amount represents 9 percent of the total students who had taken at least one online course. Park used cluster sampling method and selected 12 over 39 e-learning courses offered by the university.

650 questionnaires were distributed to the selected students as identified earlier. Prior to the distribution of questionnaire, Park had pilot-tested the instrument with 25 people. The questionnaire used Likert scale and were designed based on several earlier studies (e.g. Davis, 1993; Lee et al., 2005; Malhotra and Galletta, 1999; Ndubisi, 2006). Data collected through the questionnaire were coded into Microsoft Excel and then transferred to Statistical Analysis System (SAS) to perform descriptive statistical analyses. Then, Park randomly selected 5 percent of the coded data to check on its accuracy. Lastly, hypotheses testing were done by employing structural equation modelling (SEM) technique with the LISREL programme.

The outcomes of the research showed that both PEOU and PU were significant in determining the attitude of students toward technology in general. However, neither of these constructs had a significant direct effect on behavioural intention to use e-learning. Park explained that these results may be due to the fact that students gain familiarity with computers at a young age now. They do not depend upon schools to teach them how to use a computer, so their attitude toward usefulness or ease of use is impacted. Nevertheless, Park found a direct relationship between SN and behavioural intention to use.

Park’s research concluded that administrators and instructors need to spend more time studying this field of research and developing strategies consistent with the TAM's explanations for student acceptance as a method for improving academic performance within web based learning environments.

2.9.1.3 Technology Acceptance Model for the use of learning through websites among students in Oman

Sharma and Chandel (2013) applied TAM to identify the main factors that influence the student's intention learning through websites in Oman. This research is one of the few to focus upon students in the Middle East. This research proved the perceived link between student acceptance and use of technology and student success within a web based learning environment. Sharma and Chandel had proposed a new model based on TAM by including PU, PEOU, perceived website quality, computer self-efficacy and attitude towards e-learning as the determinants of user's behavioural intention.

In order to test the hypotheses, they had distributed Likert scale questionnaires to a random sampling of 100 undergraduate students enrolled at Sultan Qaboos University in Oman to collect data. The proposed hypotheses were tested by using parametric statistical techniques and determinants of student's behavioural intention towards online learning were identified using factor Analysis. Besides, Sharma and Chandel had deployed Pearson correlation co-efficient technique to test the relationship among various constructs and used scatter diagram to illustrate the strength of the correlation. Regression was then used to find out the statistical significance of the proposed model and to rank the significance of each parameter involved in the model.

The research reported that both PU and PEOU were critical to acceptance, consistent with the TAM. In addition, this research linked attitude, computer self-efficacy and the perception website quality also very influential

on behavioural intention towards learning through websites. The outcomes of this research had significant implications for instructors. For example, this research showed a need for instructors to develop a quality website to impress students.

Sharma and Chandel's research demonstrated that many students enter the web based learning environment with a high level of technological sophistication. Therefore, the challenge for educators may not be to simply familiarize the students with the computer or with the web based environment. Rather, instructors must be prepared to show their students why their particular online learning environment is valuable.

2.9.1.4 Acceptance of Learning Management System: A comparison between distance learners and instructors

Almarashdeh et al. (2010) research aimed to develop an effective LMS for distance learning instruction that is usable and fully utilised by students, instructors and administrators. Almarashdeh et al. stated that, many HELs are unsuccessful in using their LMS to its fullest capacity. However, they emphasised that developing a good LMS is not worthwhile if it has low acceptance. Thus, they investigated the factors that influence distance learning students' acceptance and use of the LMS and tested the applicability of the TAM in Malaysian Universities. Specifically, Almarashdeh et al. hypothesized that:

H1: Perceived Ease of Use have significant effect on Perceived Usefulness of LMS.

H2: Perceived Usefulness have significant effect on Behavioural Intention to Use of LMS.

H3: Perceived Ease of Use have significant effect on Behavioural Intention to Use of LMS.

Almarashdeh et al. employed purposive sampling technique and a total of 425 distance learning students were selected from four universities in Malaysia, namely UPM, USM, OUM and UNITAR. Questionnaire was used as the primary data collection method which was developed based on issues raised by past researches and studies, as well as concerns mentioned in the literatures related to their study. Content and the construction of the questionnaire were evaluated by two judges, who are the lecturers in the field of Instructional Technology. Also, the questionnaire demonstrated high reliability index of 0.963.

Data collected was then analysed using both descriptive and inferential statistics with the aid of SPSS. Descriptive statistics were used to illustrate the mean of each item that measure the research constructs (PU, PEOU and BITU). The findings found that students are highly agreed or highly accepted with the use of LMS in their activities. While inferential statistics were used to analyse the correlation between BITU, PU and PEOU of LMS. The results showed enough statistical evidence to support all three hypotheses formulated earlier, namely H1, H2 and H3.

Almarashdeh et al. confirmed that the findings of the research support the concept of TAM. First, PEOU has a significant impact on PU. Secondly, both PU and PEOU also have positive effect on BITU but PU exhibited significantly stronger factor than PEOU that effect BITU. Therefore, the authors concluded that the abilities of a LMS to allow student to accomplish his learning task, enhance effectiveness in learning and increase learning productivity are more important than the easy to use, easy to access information and clear interaction of the LMS. In addition, Almarashdeh et al. indicated that generally distance learners use LMS and the high acceptance level of LMS implies a desire on having distance learning management system in Malaysian Universities. Hence, developing a good LMS is worthwhile.

Almarashdeh et al. (2011) were then conducted a study of LMS acceptance based on TAM by including another group of LMS users, which are the instructors. Then, the results of instructors' acceptance of LMS obtained in this study were compared to the findings in previous study that examined distance leaners' acceptance of LMS. In this study, a total of 110 instructors from UPM, USM, OUM and UNITAR have participated in the survey. Majority of the respondents are lecturers and have good experience using LMS, at the same time are also computer-literate. The feedbacks from the instructors show that 65% of the distance learning in those universities is hybrid learning with 19% being fully online learning.

Through the descriptive analysis, it was found that instructors show a higher acceptance compared to students in the use of LMS for their teaching

activities. The study lends support to their previous study, which confirmed that PEOU has a significant impact on PU, as suggested by TAM. Both PU and PEOU are significant determinants of behavioural intention to use LMS. Also, findings from the path model show that PU exhibited a stronger factor than PEOU that influenced the BITU. Furthermore, the usefulness of the LMS led to high intention to use more than ease of use of LMS among learners. On the other hand, an ease of use of LMS led to high intention to use more than the usefulness of the LMS among instructors. In other words, the usefulness of LMS influence the learners intention to use more than an ease of use of LMS, while an ease of use LMS influence the instructor intention to use of the LMS more than usefulness of LMS.

2.9.1.5 Behaviour intention to use the Learning Management System: Integrating Technology Acceptance Model with Task-Technology Fit

Baleghi-Zadehh et al. (2014) investigate the behaviour intention to use LMS among higher education students in Malaysia. Task-technology fit (TFF) was integrated with the TAM in such a way that TTF serves as an external variable that may affect PU and PEOU thus influence behavioural intention to use LMS. Baleghi-Zadeh et al. explained that task-technology fit (TTF) is the degree to which a technology assists an individual in performing his or her portfolio of tasks. TTF suggests that an information system is successful provided that the task and functionality of the system will be correspondent.

Baleghi-Zadeh et al. formulated six hypotheses as follows:

H1: Task-technology fit has a significant effect perceived usefulness of LMS.

H2: Task-technology fit has a significant effect on perceived ease of use.

H3: Task-technology fit has a significant effect on behavior intention to use of LMS.

H4: Perceived ease of use has a significant effect on perceived usefulness

H5: Perceived usefulness has a significant effect on behaviour intention to use LMS.

H6: Perceived ease of use has a significant effect on behaviour intention to use LMS.

Baleghi-Zadeh et al. employed stratified proportional sampling and drawn 316 full time undergraduate students in the second semester of the academic year 2012-2013. These students were selected from the faculty of educational studies at two local universities nearby in Malaysia. A questionnaire with 22 items was developed to measure the research constructs, TTF, PU, PEOU and BITU. Among the 22 items, five items were developed by Baleghi-Zadeh et al. themselves while the rest were adopted from previous validated instruments. The questionnaire was pilot-tested among 40 undergraduate students and the result of Cronbach alpha analysis showed that constructs of the study was reliable, as the alpha value ranges from 0.86 to 0.94.

On the other hand, the content validity was examined by four experts of education at one of the local university.

Structural equation modelling (SEM) was used to test the hypotheses as presented earlier. The results suggested that when functionality of the LMS fit with task, students' plan for using the system will enhance. On the other hand, when students feel that LMS is more productive for their learning activities, and also LMS is user friendly, the influence of task-technology fit on intention to use of LMS will increase. The results also suggested that the correspondence between functionality of the system and LMS usage are very important which implies that LMS designers should identify educational needs and fits the systems with them. Additionally, the results of Baleghi-Zadeh et al. affirmed that PU, PEOU and TTF predict the intention to use LMS among undergraduate students.

The research of Baleghi-Zadeh et al. has several limitations. They suggested that future studies should investigate the effect of other external variables such as technical support, organizational support and system response. Besides, they also recommended that future study should encompass private universities, different faculties and part-time students with more variables.

2.9.1.6 Summary of related studies in TAM

Farahat (2012) and Sharma and Chandel (2013) consistently found that PU and PEOU are significant determinant of the intention to use online or web-

based learning. While Almarashdeh et al. (2010, 2011) and Baleghi-Zadeh et al. (2014) findings also affirmed the findings of Farahat and Sharma and Chandel, stated that PU and PEOU are significant determinant of the intention to use LMS among Malaysian universities students. Thus, this research hypothesized that both PU and PEOU have significant effects on UTAR students' intention to adopt WBLE for their studies.

Although Park (2009) did not find a relationship between PU, PEOU and BITU, however, Park revealed that SN is an important construct that affect both behavioural intention and attitude towards e-learning. However, the study of Farahat (2012) was not in line with Park's study. Farahat indicated that social influence was a significant predictor for students' intention to use online learning. Therefore, this research integrated SN as one of the research constructs, which examined whether or not SN influences UTAR students' intention to use WBLE in their studies.

In addition, Baleghi-Zadeh et al. (2014) highlighted that one of the limitations of their research was to use only an external variable which was task-technology fit. Baleghi-Zadeh et al. suggested more variables to be included in future to investigate the effect of external variables on students' perceptions. Following the recommendation from Baleghi-Zadeh et al., this research has identified student demographics as an external variable to find out whther or not gender, level of study and course of study (which is discussed in section 2.9.3) influences PU and PEOU.

Table 2.4 depicts the summary of past studies which include Almarashdeh et al. (2010, 2011), Baleghi-Zadeh et al. (2014), Farahat (2012), Park (2009) and Sharma and Chandel (2013). Then, Table 2.4 shows the comparison between past studies and present study in terms of external variables, research constructs and research findings.

Table 2.4: Summary of the related studies in TAM

Study	External Variables	Research Constructs	Research Findings
Studies in Abroad Context			
Farahat (2012)	Social Influence (SI)	• Perceived Usefulness (PU) • Perceived Ease of Use (PEU) • Attitude towards the computer (ATT) • Behavioural Intention to Use (BITU)	The results confirm that each of SI and students' PU, PEU, and their ATT towards online learning influences students' behavioural intention to use online learning. Additionally, SI of students' referent group is found to be a significant predictor for both students' attitudes and their intention to use online learning. Significant influence of PEOU was found on the PU of system.

Table 2.4 (Continued)

Study	External Variables	Research Constructs	Research Findings
Studies in Abroad Context			
Park (2009)	• E-learning self-efficacy • Subjective norm • System accessibility	• PU • Perceived Ease of Use (PEOU) • Attitude towards e-learning • BITU	Both e-learning self-efficacy and subjective norm plan an important role in affecting attitude towards e-learning and BITU e-learning. System accessibility as an organizational factor was not dominant exogenous construct affecting all endogenous construct except perceived ease of use. Subjective norm is the second most important construct that affects both behavioural intention and attitude towards e-learning. However, neither PU and PEOU had direct effect on university students' intention to use e-learning,
Sharma and Chandel (2013)	Computer self-efficacy	• PU • PEOU • Perceived website quality • Attitudes towards e-learning • BITU	PU, PEOU, perceived website quality, attitude and computer self-efficacy have positive effect on behavioural intention of students to use websites for learning.

Table 2.4 (Continued)

Study	External Variables	Research Constructs	Research Findings
Studies in Malaysian Context			
Almarashdeh et al. (2010, 2011)		• PU • PEOU • BITU	High acceptance level on LMS among distance learners and instructors. PEOU of the system give a significant impact on PU. PU of the LMS has led to high BITU more than PEOU of LMS among learners. While PEOU influences instructor BITU of LMS more than PU. PEOU and PU both have positive effect on BITU in both users.
Baleghi-Zadeh et al. (2014)	Task-technology fit	• PU • PEOU • Task-technology fit (TTF) • BITU	TTF had both a direct and an indirect effect on BITU. PU and PEOU of LMS mediated the influence of TTF on BITU. PU, PEOU and TTF predicted intention to use LMS among undergraduate students.
Present study	User demograhics such as gender, level of study and course of study	• PU • PEOU • SN • BITU	PU, PEOU and SN were a significant influential of UTAR students' intention to use WBLE in their studies. Gender, level of study and course of study did not have effects on PU and PEOU.

2.9.2 Related Studies on the Relationship between PU and PEOU, and the Influences of these Two Constructs on BITU

Empirical studies such as Almarashdeh et al. (2010, 2011), Baleghi-Zadeh et al. (2014), Chang and Tung (2008), Farahat (2012), Premchaiswadi

and Porouhan (2012), Punnoose (2012), Sharma and Chandel (2013), Theng et al. (2008), and Zhang et al. (2008) revealed PU of e-learning system is positively correlated with behavioural intention to use e-learning. They found that students who find e-learning as useful are more likely to accept and use it as a mode of learning.

In the study of Zhang et al. (2008), the findings concluded that that PEOU is also a determinant of learners' acceptance behaviour towards using e-learning technology and helps students accept the importance of the system to their study performance. This findings were also supported by the studies of Almarashdeh et al. (2010, 2011), Baleghi-Zadeh et al. (2014), Chang and Tung, (2008), Premchaiswadi and Porouhan (2012), Sharma and Chandel (2013), and Theng et al. (2008).

Besides that, Almarashdeh et al. (2010, 2011), Chang and Tung (2008), Farahat (2012), Grandon et al. (2005), Park (2009), Punnoose (2012), Theng et al. (2008), and Zhang et al. (2008) consistently found that PEOU is also positively correlated with PU. Landry et al. (2006) concluded that if students perceived Blackboard (an e-learning system in the context of the study) to be easy to use, they would also perceive Blackboard to be useful.

The research findings in the past studies found that perceived usefulness (e.g. Almarashdeh et al., 2010, 2011; Alatawi et al., 2014; Baleghi-Zadeh et al., 2014; Chang and Tung, 2008; Ducey, 2013; Dulcic et al., 2012; Farahat, 2012; Premchaiswadi and Porouhan, 2012; Sharma and Chandel, 2013;

Theng et al., 2008; Zhang et al., 2008), and perceived ease of use (e.g. Almarashdeh et al., 2010, 2011; Alatawi et al., 2014; Baleghi-Zadeh et al., 2014; Chang and Tung, 2008; Cowen, 2009; Dulcic et al., 2012; Premchaiswadi and Porouhan, 2012; Sharma and Chandel, 2013; Theng et al., 2008; Zhang et al., 2008) had significant impact on user acceptance of information systems used in their studies. Thus, this research investigates users' PU and PEOU toward WBLE and examines the relationship between these two beliefs and behavioural intention to use (BITU) WBLE.

2.9.3 Related Studies on the Influence of User Demographics on PU and PEOU

TAM predicts that external variables will influence technology adoption indirectly through perceived usefulness and perceived ease of use (Szajna, 1996 cited in Brown, 2002). The external variables shown to have an influence on PU and PEOU are many and varied. In this research, the focus is on individual user characteristics specifically demographic variables.

According to Chen et al. (2000, cited in Yusoff et al., 2009), individual differences play a major role in determining user performance on information retrieval systems. Citing Stylianou and Jackson (2007), Agarwal and Prasad (1999) and Yi et al. (2006) defined individual diferences as "dissimilarities among people including differences in perceptions and behaviours, traits and personality characteristics, and circumstances" (p. 12). Yi et al. (2006) stated that individual differences have main effects on technology use and that they also interact with perceptions about technologies to influence technology use.

Previous studies have examined various individual differences such as computer self-efficacy (Chang and Tung, 2008; Punnoose, 2012; Sharma and Chandel, 2013; Theng et al., 2008), e-learning self-efficacy (Park, 2009), internet experience (Premchaiswadi and Porouhan), personal innovativeness (Lu et al., 2005), computer experience (Yi et al., 2006), and so forth.

Islam et al. (2011) asserted that demographic factors (such as level of education, gender and programme of study) are major factors in understanding and appreciating e-learning. In the study of Abbad et al. (2011), demographic profile had been identified as the external variables that would influence on the students' adoption of LMS. These demographic differences included gender, age, income, and computer ownership. The results showed significant income on PU and PEOU and significant age on PU.

Afari-Kumah and Achampong (2010) explored the effect of students' background on PU and PEOU, found that age, level of study did not significantly influence the students' perception of usefulness and ease of use. However, prior experience of computer usage does influence perception of ease of use of computer usage.

Following studies by Abbad et al. (2011), Afari-Kumah and Achampong (2010) and Islam et al. (2011), this research expected that the user demographics may influence PU and PEOU and thus affect BITU in the context of WBLE usage. The user demographics include gender, level of study (Foundation studies versus Undergraduate courses) and course of study

(Foundation in Arts, Foundation in Science, Arts-based undergraduate courses, and Science-based undergraduate courses). In the following sub-sections, these demographic variables are explored that may influence user acceptance of WBLE.

2.9.3.1 Gender

Gender plays a key role in determining how users make their decisions about adopting and using new technologies (Venkatesh and Morris, 2000). The role of the user's gender in user acceptance research has been clearly recognized, though, with conflicting results. Ong and Lai (2006), and Terzis and Economides (2011) examined the effect of gender differences on the perceptions of users toward technology usage. Both studies yielded consistent results, concluding that IT may be perceived differently by the sexes.

In Ong and Lai's research, men's rating of PU, PEOU, and behavioural intention to use (BITU) e-learning were higher than women's. Ong and Lai claimed that men's perception of PU was more noticeable than women's in determining behavioural intention to use e-learning, while women's e-learning usage decisions were more salient influenced by their perception of ease of use of e-learning.

Meanwhile, Terzis and Economides unveiled the perception of men are influenced by their belief of how much useful the Computer Based Assessment in enhancing their knowledge and performance while women on the other side

are more likely to use the system if it is easy to use with simple design and logical flow.

Nonetheless, the findings of the studies of Ong and Lai (2006), and Terzis and Economides (2011) were inconsistent with the findings of several studies such as Abbad et al. (2011), Atchariyachanvanich et al. (2007), Wong et al. (2012), and Yi et al. (2006).

Abbad et al. (2011) explored the demographic influences (gender, age, income and computer ownership) on the factors that affect students' adoption of LMS (such as PU and PEOU). The results from 470 students in Arab Open University (AOU) showed significant gender differences for Internet experience and self-efficacy but not on PU and PEOU.

On the other hand, Atchariyachanvanich et al. (2007) examined the effect of online customers' characteristics (gender, marital status, age group, income level, education level, net-orientation and innovativeness) on the intention to purchase, repurchase and actual purchase in Internet shopping. The results of 1215 Japanese online customers showed that gender had no significant effects on any process of online consumer purchasing intention.

In addition, Wong et al. (2012) explored the role of gender as external variables in an education context to investigate if any gender difference exists in the effect of the determinants on behavioural intention. The findings obtained from 302 students-teachers also failed to verify the prediction about

gender difference that exists in the effect of the determinants (such as PU, PEOU) on behavioural intention.

While Yi et al. (2006) cites that previous studies suggest that individual differences have main effects on technology use and that they also interact with perceptions about technologies to influence technology use. Thus they incorporate individual differences into TAM and examine the two effects simultaneously. Yi et al. hypothesized that:

- Women's perception of ease of use of a new technology will be lower than men's;
- Women's perception of usefulness of a new technology will be lower than men’s.
- The influence of PEOU on technology use will be moderated by gender, such that PEOU will influence technology use more strongly for women than for men;
- The influence of PU on technology use will be moderated by gender, such that PU will influence technology use more strongly for men than for women.

The findings from 89 second-year undergraduates of the business school in a local university in Singapore proved that gender do not affect either PU or PEOU. However, gender influence technology use directly and also moderates the relationship between PU and technology use. Specifically, Yi et al. found that females use the statistical program more often than males, and PU is more salient for females than males in predicting technology use.

The conflicting results about the impact of gender on PU and PEOU could be caused by socio-cultural differences, different measures employed in the studies and unknown variables. Given the inconsistent findings from past studies in relation to the effect of gender on PU and PEOU, this research aims to examine if gender is one of the factors that affect PU and PEOU of WBLE and in turn affect the intention to use WBLE.

2.9.3.2 Level of study

Agarwal and Prasad (1999) described the level of education as "level of education is indicative of potential adopter's ability to learn and, therefore, should be positively associated with beliefs" (p. 371). Citing Agarwal and Prasad, Bower and Hilgard (1981), claimed that "As noted in the cognitive approaches to learning, more sophisticated cognitive structures, perhaps acquired through higher education, lead to a greater ability to learn in a novel situation". Agarwal and Prasad then hypothesized that level of education is positively associated with ease of use and usefulness beliefs about an information technology innovation. The results of the hypothesis testing proved that level of education was positively associated with ease-of-use beliefs only, not with perceived usefulness.

Islam et al. (2011) explored the effect of students' demographic factors (e.g. gender, marital status, race, program of study, level of education and age) on the effectiveness of the e-learning system in a Malaysia higher learning institution. Through one-way ANOVA, Islam et al. affirmed that the level of

education had significant effect on the effectiveness on e-learning and concluded that level of education (advanced/ higher/ graduate diploma, diploma qualifications, and degree holders) is a major factor in understanding and appreciating e-learning.

Further, Islam et al. presumed that students with high levels and strong educational background have a broader knowledge on the use of technology and its advantages on gaining scholastic achievement. They are exposed to the latest innovation that technology offers and expected to be more computer literate which makes it easy for them to explore the Internet. Also, students with higher level of education tend to update their knowledge and information that can easily gain through e-learning. For example, rather than go to the library to research about a new topic, they just make use of the online library. Hence, e-learning for them is effective.

On the other hand, Afari-Kumah and Achampong (2010) examined the role of factors such as age, level of study, and the computer usage experience of a student in determining the computer usage intentions of tertiary students in Ghana. Based on the t-test values, it was found that the level of student did not significantly influence the students' perception either on usefulness or ease of use. Afari-Kumah and Achampong explained that this could be a reflection of the determination of students to learn to use the computer regardless of their level (e.g. certificate, diploma, undergraduate and postgraduate).

Previous studies have produced seemingly conflicting results about the impact of level of study on the use of digital technology. This research intends to examine if level of study is one of the variables that influence perceived usefulness and perceived ease of use thus affect the intention to use LMS (i.e. WBLE).

2.9.3.3 Course of study

There is limited research that explores the direct effect of course of study on the user's perception towards technology. Previous studies such as Islam et al. (2011) and Mufutau et al. (2012) had examined the influence of programme of study on the use of e-learning and digital library respectively.

Islam et al. found that the programme of study (e.g. IT, business administration, humanities and social sciences, and graduate studies) has significant effect on the effectiveness of e-learning. Following the research of Islam et al., the study of Mufutau et al. hypothesized that there is a significant influence of program of study on the use of digital library by the post graduate students. The results of the hypothesis testing corroborated the findings of Islam et al., which suggested that programme of study has a significant influence on the use of digital library by the post graduate students.

In addition, Rolfe et al (2008) who explored the attitudes of staff towards e-learning across both the Arts and Sciences discovered that academic staff has different perception towards e-learning in Arts and Science Faculties.

In the Arts, staff felt that the use of e-learning was perhaps of less benefit to the subject because their academic subject required deeper levels of analysis and discussion that e-learning could not provide. In contrast, Science staff are more aware of the potential benefits of e-learning. They felt that their academic subjects suited to the use of e-learning, for example the use of animations to teach biology, and the use of experimental and laboratory simulations.

Following the studies of Islam et al. (2011), Mufutau et al. (2012) and Rolfe et al. (2008), this research aims to examine whether or not the course of study affects the perception towards LMS (i.e. WBLE) on usefulness and ease of use and in turn influence the intention to use LMS.

2.10 Conclusion

E-learning system such as LMS is designed to supplement teaching and learning process. It can be effective at boosting students' learning performance but largely depends upon if the platform is used properly and correctly by the students. Apparently, the benefits derived from using e-learning would not be maximized if the system not accepted and adopted by the students. Thus, it is vital to assess the barrier to the acceptance of e-learning system because user acceptance is the key factor that determines the success or failure of an information system.

Davis's TAM was developed to predict user's behavioural intention to use a specific information system. According to Davis, PU and PEOU were strong determinants of technology usage intention. Past studies had shown the power of TAM in exploring various factors that influence adoption of an information system at the same time aid in predicting actual system use. Thus, this research adopted the well-known TAM that was developed by Davis as the foundation to develop the proposed TAM to investigate students' perceptions toward WBLE and their intention to use it which is presented in chapter 3.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methodology used to carry out the research. It covers topics such as research methods, research samples, research instrument, data collection procedure and data analysis techniques.

3.2 Research Methods

Research methods referred to methods or techniques that are used to conduct a research (Kothari, 2011). Two major types of research methods are qualitative and quantitative research.

3.2.1 Qualitative Research

Leedy and Omrod (2004) described qualitative research as:

> Qualitative research is typically used to answer questions about the complex nature of phenomena, often with the purpose of describing and understanding the phenomena from the participants' point of view (p. 94).

Qualitative research adopts a more informal and subjective approach to problem solving (Keele, 2010). Keele added that qualitative research tends to be inductive, which means it generates theory.

Researchers tend to approach the research process with a willingness to be flexible and to follow whether the data lead them and conclusions are expected to appear out of the data as they are collected and studied (McNabb, 2013). Rather than dealing with large sample, qualitative researchers tend to select a few participants who can best shed light on the phenomenon under investigation.

According to Leedy and Ormrod (2004), there are five common types of qualitative research, which are:

- **Case Study:** The main objective of this design is to study a particular individual, event or program in depth for a defined period of time, and is especially suitable for unearthing information in regards to poorly understood situation. However, its major disadvantage is that the findings are usually not generalizable to a wider population, especially when only a single case is involved in the study.
- **Ethnography:** Unlike case study that focuses on a single person, ethnography looks at an entire group that shares a common culture. The main objective of ethnography is to focus on the everyday behaviors of that group, in order to identify their

cultural norms, beliefs, social structures and other cultural patterns.

- **Phenomenological Study:** Leedy and Ormrod defined phenomenological study as a study that attempts "to understand people's perceptions, perspectives, and understandings of a particular situation" (p. 139). For example to study the experiences of people who are living in abusive relationships or to study the experiences of people caring for a dying relative.
- **Grounded Theory Study:** It is a systematic way to develop a theory or a theoretical model by analyzing data that have been collected in the field, hence the term "grounded", instead of taking it from the existing literatures. This design is especially useful when the existing theories about a particular phenomenon are inadequate.
- **Content Analysis:** Defined as "a detailed and systematic examination of the contents of a particular body of materials for the purpose of identifying patterns, themes or biases" (p. 142). This includes but not limited to recorded human communications such as books, newspapers, television, art, music, and films of human interactions or conversations. Content analysis is also the design which involves the greatest amount of planning at the beginning phase of the project.

3.2.2 Quantitative Research

Quantitative research involves formal and objective approach to problem solving (Keele, 2010). It is guided by a strict set of rules and formal processes (McNabb, 2013). McNabb noted that, in a typical quantitative research, specific hypotheses are established prior to the data gathering and tested during the analysis. Besides, variables are identified and explicitly defined beforehand. Keele stated that quantitative research is more inclined to be deductive, which means that it tests theory.

Leedy and Omrod (2001, cited in William, 2007) noted that quantitative research aims to establish, confirm, or validate relationships and to develop generalizations that contribute to theory. Lennon-Dearing and Neely-Barnes (2012) further added that, quantitative research collect numerical data for analysis to explain, predict, and/or control phenomena of interest. It is often deal with large sample that represent the population (Leedy and Omrod, 2004).

Leedy and Omrod further added that there are two broad classifications of quantitative research, which are:

- **Descriptive research:** Descriptive research design involves identifying the characteristics of an observed phenomenon and exploring possible correlations among two or more phenomena.
- **Experimental research:** In experimental research, the researcher investigates the treatment of an intervention into the study group and then measures the outcomes of the treatment.

3.2.3 Implication for the Research

Quantitative method that uses a descriptive design is regarded as the best suited method for this research. Firstly, this is because quantitative methods allow the researcher to begin with problem statement, formation of hypothesis and yield statistical data analysis. While qualitative methods did not uses data that are structured in the form of numbers, and is more subjective which may not fully separate the values of researcher from the objectivity of the research process (Stangor, 2014). Secondly, this research has identified several variables through literature review. As such, quantitative research method is appropriate as it allows the researcher to test relationships of variables and to develop generalizations that contribute to theory. Also, descriptive method relies on collecting data related to participants within their natural setting, thus could eliminate interviewer bias (Leedy and Omrod, 2004). Another major benefit of a quantitative descriptive study is that a large sample of subjects can be examined and its potential for generalization (Picciano, 2004).

A common technique used for collecting descriptive research data is survey research (Mertler, 2013). Houser (2014) stated that "a survey of descriptive design involves the use of self-report to clarify perceptions, attitudes, or behaviours of a target group" (p. 72). Survey research was determined to be appropriate for the primary data collection technique for this research. This is because this research required to acquire information about selected samples of respondent from a selected population through a structured

questionnaires which consists of queries that deal with their intention, behavioural patterns, opinion and demographics, then is required to tabulate their answers (Babbie, 2013; Leedy and Ormrod, 2004; Neelankavil, 2007).

Furthermore, Babbie (2013) stated that survey is the most popular method and especially appropriate for conducting a descriptive study on a large population. Also, the main consideration in choosing data collection approach is the time limit available for this research. Thus, survey approach was the best approach to retrieve information from the survey instrument due to its capability in collecting large amount of data for a fairly low cost in the shortest time possible (Kelly et al., 2003). Three most common methods for administering a survey are as follows:

- **Self-administered questionnaires:** Self-administered questionnaire is a survey that is executed without an interviewer, in which the respondent reads and completes the questionnaire at his/her own, on either a paper questionnaire or electronic questionnaire (Zikmund and Babin, 2007).
- **Face-to-face interviews:** According to Leedy and Ormrod (2004), face-to-face interviews in a quantitative research usually involve structured interview in which the interviewer will ask a standard set of questions to the respondents and is responsible for writing down the responses.
- **Telephone surveys:** Leedy and Ormrod (2004) mentioned that telephone surveys are less time consuming and less expensive when compared to face-to-face interviews because the

interviewer has ready access to basically anyone who has a telephone, and the interviewer also saves on travelling time and expenses.

In this research, self-administered questionnaire was regarded as the most appropriate method. It is a low cost data collection tool and has ability to reach a wider coverage of respondents in a shorter time frame as compared to other survey tools (Babbie, 2012; Kolb, 2008; Lewis-Beck et al., 2004). Furthermore, this survey tool allows respondents to stay anonymous, it could promote honesty in answering question (Leedy and Ormrod, 2004; Mitchell and Jolley, 2012). Besides, it could eliminate bias that might result from researcher influencing the respondent to answer question in a certain way (Kolb, 2008). More, this survey tool is more convenient for the respondents as they may complete the form at their own pace at the location and time that is best for them (Kolb, 2008).

Although the foremost advantage of face-to-face interviews is that such method yields the highest response rates (Leedy and Ormrod, 2004) and the interviewer can clarify misunderstandings during the interviews if the respondent happens to miscomprehend the questions (Aaker et al., 2006), however, as Leedy and Ormrod claimed, the major downside of face-to-face interview is that it is very time consuming and costly to carry out if the targeted respondents are high in amount or reside in variety of states or countries. Hence, face-to-face-interviews are inappropriate to be used in this research

since the survey was conducted across three campuses that located in different states and involved a large number of students.

On the other hand, telephone surveys also deemed as inappropriate method since it is time consuming and have difficulty to obtain students' contact details before the implementation of the survey. Moreover, Leedy and Ormrod asserted that the major downside is that the response rates are usually lower than that of face-to-face interviews because many people are annoyed at being bothered on the phone and it is also easier for respondents to reject the interviewer on the phone than in a face-to-face situation. Aaker et al. (2006) further added that respondents tend to get bored if the telephone surveys lasted longer than 10 minutes.

3.3 Research Samples

Sampling is the selection of research participants from an entire population to observe (Thompson, 2012). According to Durrheim (2006), the concern underlies in sampling is about selecting a sample that will be representative of the population the researcher is intended to draw conclusions on and the size of the sample. Durrheim added that, often, sample size is determined based on practical constraints such as the size of the population, cost and time that are available for research.

According to Roscoe (1975), sample sizes larger than 30 and less than 500 are appropriate for most research; when samples are to be divided into sub samples, a minimum sample size of 30 for each category is necessary. Citing Leedy and Ormrod (2004), Gay and Airasian (2003) noted that "beyond a certain point (at about 5000 units of more), the population size is almost irrelevant, and a sample size of 400 should be adequate" (p. 113).

The target population of this research are full-time foundation studies and undergraduate UTAR students from different faculties across three campuses (i.e. Perak, Petaling Jaya, and Kuala Lumpur campuses). 445 students who have access to WBLE from different levels of study (Foundation studies or undergraduate), and courses (Foundation in Arts, Foundation in Science, Arts-based undergraduate courses, and Science-based undergraduate courses) participated in the empirical study.

3.4 Research Instrument

To investigate user acceptance of WBLE using the proposed TAM as shown in Figure 2.12, this research used a structured self-administered questionnaire as appended in Appendix A to collect data. The questionnaire consisted of four sections as follows:

- Section A: Perceived usefulness and Perceived Ease of Use toward WBLE

- Section B: Social Influence and Behavioural Intention to Use the WBLE
- Section C: Actual Usage of WBLE
- Section D: Personal Details

Sections A and B of the questionnaire measured the research constructs such as perceived usefulness, perceived ease of use, subject norm and behavioural intention to use WBLE using a 5-point Likert-type scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Each participant was required to complete the questionnaire indicating his/ her agreement or disagreement with each statement that built into those constructs. The statements in the questionnaire were adapted from relevant scales in previous studies, as shown in Table 3.1.

Table 3.1: Sources for questionnaire statements

A1: Perceived Usefulness	
Statement	**Sources**
1. Using WBLE increases my productivity/ helps me to be a productive student.	Davis, 1989; Ku, 2009; Park et al., 2014; Shen et al., 2006; Wu and Chen, 2005
2. Using WBLE enhances the effectiveness on the course coursework and my learning.	Chuttur, 2009; Davis, 1989; Joo and Sang, 2013; Ku, 2009; Liao et al., 2008; Ngai et al., 2007; Ortega Egea and Rom án Gonz ález, 2011; Shen et al., 2006; Wu and Chen, 2005
3. Using WBLE makes me easier to do the course coursework.	Davis, 1989; Joo and Sang, 2013; Ortega Egea and Rom án Gonz ález, 2011; Shen et al., 2006

Table 3.1 (Continued)

A1: Perceived Usefulness	
Statement	**Sources**
4. Using WBLE improves my study performance in this course.	Chuttur, 2009; Davis, 1989; Ku, 2009; Liao et al., 2008; Ngai et al., 2007; Ortega Egea and Román González, 2011; Padilla-Meléndez et al., 2013; Sánchez and Hueros, 2010; Shen et al., 2006; Wu and Chen, 2005
5. WBLE makes me easier to learn in university.	Ngai et al., 2007; Sánchez and Hueros, 2010
6. WBLE gives me greater control over learning.	Ngai et al., 2007; Sánchez and Hueros, 2010
7. I find WBLE a useful tool for my learning in this course.	Davis, 1989; Ku, 2009; Ortega Egea and Román González, 2011; Padilla-Meléndez et al., 2013; Park et al., 2014; Shen et al., 2006; Wu and Chen, 2005
8. Overall, I find WBLE to be advantageous to my learning in this course.	Cheung and Vogel, 2013; Ngai et al., 2007; Sánchez and Hueros, 2010
A2: Perceived Ease of Use	
Statement	**Sources**
1. Learning to operate WBLE is easy for me.	Cheung and Vogel, 2013; Chuttur, 2009; Davis, 1989; Joo and Sang, 2013; Kripanont 2007; Ku, 2009; Liao et al., 2008; Ngai et al., 2007; Park et al., 2014; Sánchez and Hueros, 2010; Shen et al., 2006
2. I would find it easy to get WBLE to do what I want it to do.	Davis, 1989; Chuttur 2009; Joo and Sang, 2013; Kripanont,2007, Ku, 2009; Lee and Lehto, 2013; Liao et al., 2008; Ngai et al., 2007; Ortega Egea and Román González, 2011; Padilla-Meléndez et al., 2013; Shen et al., 2006; Wu and Chen, 2005
3. My interaction with WBLE is clear and understandable.	Chuttur, 2009; Davis, 1989; Joo and Sang, 2013; Ku, 2009; Lee and Lehto, 2013; Liao et al., 2008; Ortega Egea and Román González, 2011; Padilla-Meléndez et al., 2013; Park et al., 2014; Sánchez and Hueros, 2010; Shen et al., 2006; Wu and Chen, 2005
4. It would be easy for me to become skilful at using WBLE.	Cheung and Vogel, 2013; Joo and Sang, 2013; Liao et al., 2008; Ortega Egea and Román González, 2011; Wu and Chen, 2005

Table 3.1 (Continued)

A2: Perceived Ease of Use	
Statement	**Sources**
5. My interaction with WBLE does not require a lot of mental effort.	Chuttur, 2009; Liao et al., 2008; Ortega Egea and Román González, 2011; Wu and Chen, 2005
6. Overall, I find WBLE easy to use.	Cheung and Vogel, 2013; Joo and Sang, 2013; Lee and Lehto, 2013; Ortega Egea and Román González, 2011; Padilla-Meléndez et al., 2013; Park et al., 2014; Sánchez and Hueros, 2010; Wu and Chen, 2005
B1: Subject Norm	
Statement	**Sources**
1. My lecturers expect me to use WBLE.	Cheung and Vogel, 2013; Shen et al., 2006
2. My lecturers want me to use WBLE frequently.	Cheung and Vogel, 2013; Shen et al., 2006
3. My lecturers are very supportive in the use of WBLE for my course.	Cheung and Vogel, 2013
4. Peers/ my course mates want me to use WBLE frequently.	Cheung and Vogel, 2013; Shen et al., 2006
B2: Behavioural Intention to Use WBLE in the future	
Statement	**Sources**
1. Assuming I have access to WBLE, I intend to use it.	Ku, 2009; Ortega Egea and Román González, 2011; Park and Kim, 2014; Wu and Chen, 2005
2. Given that I have access to WBLE, I plan to use it.	Ku, 2009; Wu and Chen, 2005
3. To the extent possible, I would use WBLE to do different things, from downloading course materials (e.g. lecture notes, etc.) and participating learning activities on the WBLE.	Ngai et al., 2007
4. I intend to increase my use of WBLE in the future.	Ku, 2009; Liao et al., 2008; Ngai et al., 2007
5. Overall, I have a positive perception towards using WBLE.	Dulcic et al., 2012

In Section C, participants were asked to assess their actual usage of WBLE. They were asked to indicate their frequency of accessing WBLE and utilising its features, their purposes of accessing WBLE and length of time they spent each time logging into WBLE. Participants were also asked to rate the level of usefulness of each of the features in WBLE, and select other online technologies as the alternative tools to WBLE for learning purpose. The last section in the questionnaire contains items that solicited demographic data of the students.

Prior to the empirical study, a preliminary study was carried out among 30 undergraduate students to pilot-test the survey questionnaire for its reliability. These respondents were excluded from the empirical study to avoid contamination (van Teijlingen and Hundley, 2001). The data collected through the preliminary study were evaluated using the most popular test of inter-item consistency reliability that is the Cronbach's alpha coefficient.

According to Curtis and Drennan (2013), the Cronbach's alpha values greater than 0.7 are considered acceptable, while values greater than 0.8 indicating good internal consistency. The results displayed in Table 3.2 shows that the Cronbach alpha coefficient of the four constructs ranging from 0.812 through 0.929. Moreover, the Cronbach's alpha coefficient for all the 23 statements is 0.922. Since all the Cronbach's alpha values are greater than 0.80, thus, the results of Cronbach's analysis revealed that the survey questionnaire for this research had demonstrated a high level of internal consistency and reliability among items. The questionnaire was well-constructed and reliable.

Table 3.2: Cronbach's alpha (α) coefficient for each attribute in the survey questionnaire

Research Construct	Items	Cronbach's Alpha (α)
Perceived Usefulness of WBLE	8	0.849
Perceived Ease of Use of WBLE	6	0.929
Subjective Norm (social influence of using WBLE)	4	0.812
Behavioural Intention to use WBLE in the future	5	0.854
TOTAL	**23**	**0.922**

3.5 Data Collection Procedure

The empirical study was conducted in Universiti Tunku Abdul Rahman across three campuses (i.e. Perak, Petaling Jaya and Kuala Lumpur campuses). The survey instrument was administered to students from different courses with the assistance of several lecturers during the regular class time on either 14th week of the May 2014 trimester (for undergraduate students) or the first week of the October 2014 trimester (for Foundation studies students). The survey was completed in approximately 15-minute for each student.

Since the number of students in all the classes that involved in the survey is different, so the total number of samples for different courses is different too. 131 questionnaires were administered to the undergraduate students of Arts-based courses from Faculty of Creative Industries, 114 questionnaires to the undergraduate students of Science-based courses from Faculty of Engineering and Sciences, 99 questionnaires to the students from

Foundation in Arts, and 101 questionnaires to the students from Foundation in Science.

3.6 Data Analysis

Data analysis involved the coding of data and interpreting the results using SPSS (Statistical Package for Social Science). Both descriptive and inferential analysis techniques were used to analyse the data collected from questionnaire and to test the hypotheses formulated in chapter 1.

Descriptive statistics were used to organise, summarise and present student demographics (i.e. gender, level of study and course of study), as well as the pattern and behaviour of WBLE usage. These research findings are presented through the use of tables and figures (e.g. pie and bar charts), which are further described in sections 4.2 and 4.3.

Besides, descriptive statistics were also used to test null hypotheses 1 and 2 ($H_0$1 and $H_0$2). Descriptive statistics were used to present the results of respondents' degree of agreement with the statements that measure the perceived usefulness (PU) of WBLE, perceived ease of use (PEOU) of WBLE, and behavioural intention to use (BITU) WBLE. Means, standard deviation, frequency and percentages of cases were generated to find out the number of respondents that agree or disagree with the statements that measure PU, PEOU, and BITU.

Apart from that, inferential statistics such as independent samples t-test, one-way ANOVA test and Pearson's Coefficient Correlation were used to test null hypotheses 3 ($H_0$3) through 7 ($H_0$7). All these tests yield a p value. P value of 0.05 is considered on the borderline of statistical significance, which implies that a 5 percent chance exists that the results occurred by chance (McEntarffer and Weseley, 2007). The smaller the p value, it indicates more significant results.

Bui (2009) noted that the independent samples t-test is the most common and simplest test to use when comparing mean differences between two independent groups. Thus, it was used to test:

- **$H_0$3a and $H_0$3b:** to explore whether there is a significant difference between the mean scores of male and female students on the perceived usefulness and perceived ease of use of WBLE respectively, and
- **$H_0$3c and $H_0$3d:** to determine whether there is a significant difference between the mean scores of foundation studies and undergraduate students on the perceived usefulness and perceived ease of use of WBLE respectively.

In short, the independent samples t-test was used to determine whether the mean difference for the dependent variables (perceived usefulness and perceived ease of use) due to the independent variables (males versus females, and foundation level versus undergraduate level) is a real difference or the result of some other chance factor.

One-way Analysis of Variance (ANOVA) test is the direct extension of the independent sample t-test to three or more groups (Pace, 2012), hence, it was used to test $H_0$3e through $H_0$3f, to examine if there are significant differences exist between respondent's course of study (i.e. Foundation in Arts, Foundation in Science, Arts-based undergraduate courses, and Science-based undergraduate courses) in perceiving the usefulness and ease of use of WBLE, and to determine whether the variance among the means of the groups is a function of chance alone.

Pearson correlation coefficient (r) is the most widely used correlation coefficient when both variables are measured on an interval or ratio scale (Jackson, 2011; Schumacker, 2014). It was used to test $H_0$4 through $H_0$7 to measure the strength of a linear association between two variables, including: (i) perceived ease of use and perceived usefulness; (ii) perceived usefulness and behavioural intention to use WBLE; (iii) perceived ease of use and behavioural intention to use WBLE; and (iv) subjective norm and behavioural intention to use WBLE.

According to Allen et al. (2008), "r" value can range from -1 to +1, in which values closer to 1 indicate a perfect relationship while values closer to 0 indicate no relationship between variables. A correlation of r = 0.10 represents a small effect size, r = 0.30 a medium effect size, and r = 0.50 a large effect size (Colman and Pullford, 2011). The sign (+/-) is an indication of whether the relationship is positive or negative. Positive relationship implies that increases

in one variable corresponds to a decrease another, and vice versa for negative relationship.

To determine whether the coefficient is statistically significant, a probability value (p value) need to be reviewed (Hatcher, 2003). Hatcher asserted that, p value may range in size from 0.00 through 1.00. Null hypothesis should be rejected if p value lesser than 0.05, while null hypothesis should not be rejected if it is equal or larger than 0.05.

Table 3.3 summarises the statistical analysis methods that are used for hypotheses testing and the relationship variables in accordance with the hypotheses is presented in Figure 3.1. The result of hypotheses testing validated the applicability of the proposed TAM as depicted in Figure 2.12.

Table 3.3: Summary of the statistical analysis methods used in hypotheses testing

Null Hypothesis		Statistical Analysis Method
$H_0$1a:	Students do not perceive that WBLE is useful.	Descriptive Statistics
$H_0$1b:	Students do not perceive that WBLE is easy to use.	Descriptive Statistics
$H_0$2:	Students do not intend to use WBLE in their study.	Descriptive Statistics
$H_0$3a:	Students' gender does not have any significant effects on perceived usefulness (PU) of WBLE.	Independent samples t-test
$H_0$3b:	Students' gender does not have any significant effects on perceived ease of use (PEOU) of WBLE.	Independent samples t-test
$H_0$3c:	Students' level of study does not have any significant effects on perceived usefulness (PU) of WBLE.	Independent samples t-test

Table 3.3 (Continued)

Null Hypothesis		Statistical Analysis Method
$H_0$3d:	Students' level of study does not have any significant effects on perceived ease of use (PEOU) of WBLE.	Independent samples t-test
$H_0$3e:	Students' course of study does not have any significant effects on perceived usefulness (PU) of WBLE.	One-way Analysis of variance (ANOVA) test
$H_0$3f:	Students' course of study does not have any significant effects on perceived ease of use (PEOU) of WBLE.	One-way Analysis of variance (ANOVA) test
$H_0$4:	There is no significant relationship between PEOU and PU of WBLE.	Pearson Correlation coefficient (r)
$H_0$5:	There is no significant relationship between PU and behavioural intention to use WBLE.	Pearson Correlation coefficient (r)
$H_0$6:	There is no significant relationship between PEOU and behavioural intention to use WBLE.	Pearson Correlation coefficient (r)
$H_0$7:	There is no significant relationship between subjective norm and behavioural intention to use WBLE.	Pearson Correlation coefficient (r)

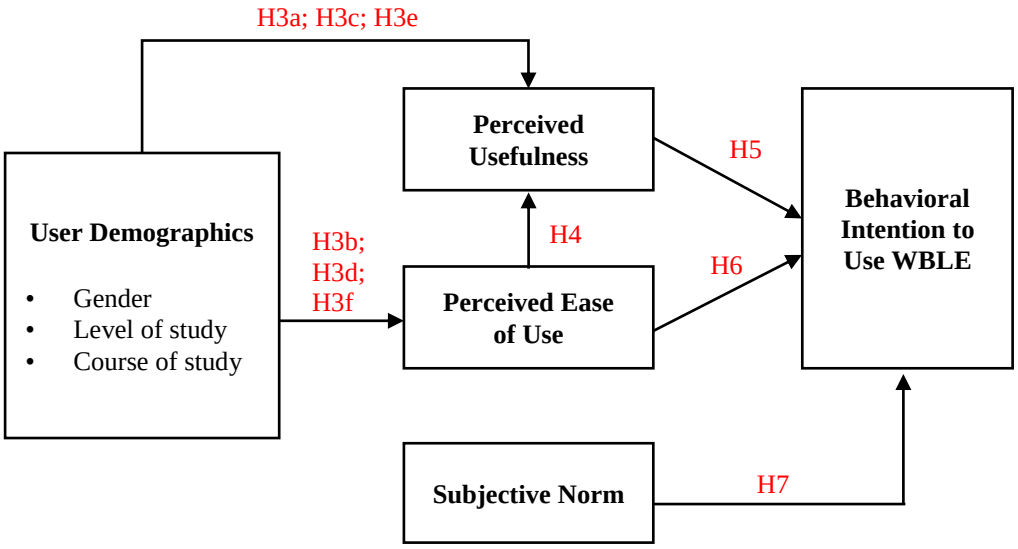

Figure 3.1: Proposed technology acceptance model and relevant hypotheses

3.7 Conclusion

This chapter described the activities and processes involved in conducting this research. It includes identifying research methods, data collection procedures, research samples and the appropriate statistical methods to do data analysis. The research methodology explained in this chapter leads to the discussion of research findings in chapter 4.

CHAPTER 4

DATA ANALYSIS AND RESEARCH FINDINGS

4.1 Introduction

This chapter presents the research findings that are concerned with the research objectives, which were formed at the earlier stage of the research. Data were obtained using the self-administered questionnaires, completed by 445 UTAR students. All collected data were coded into SPSS (Statistical Package for Social Science), then both descriptive statistics and inferential statistics were used in data analysis. The discussion of the research findings are divided into three sections as below:

- The findings of data analysis on the respondent demographics
- The findings of data analysis on the actual usage of WBLE
- The findings of hypotheses testing

4.2 The Findings of Data Analysis on the Respondent Demographics

One of the research objectives is to assess the effect of demographics such as gender, course of study and level of study on users' perceived usefulness and ease of use toward WBLE.

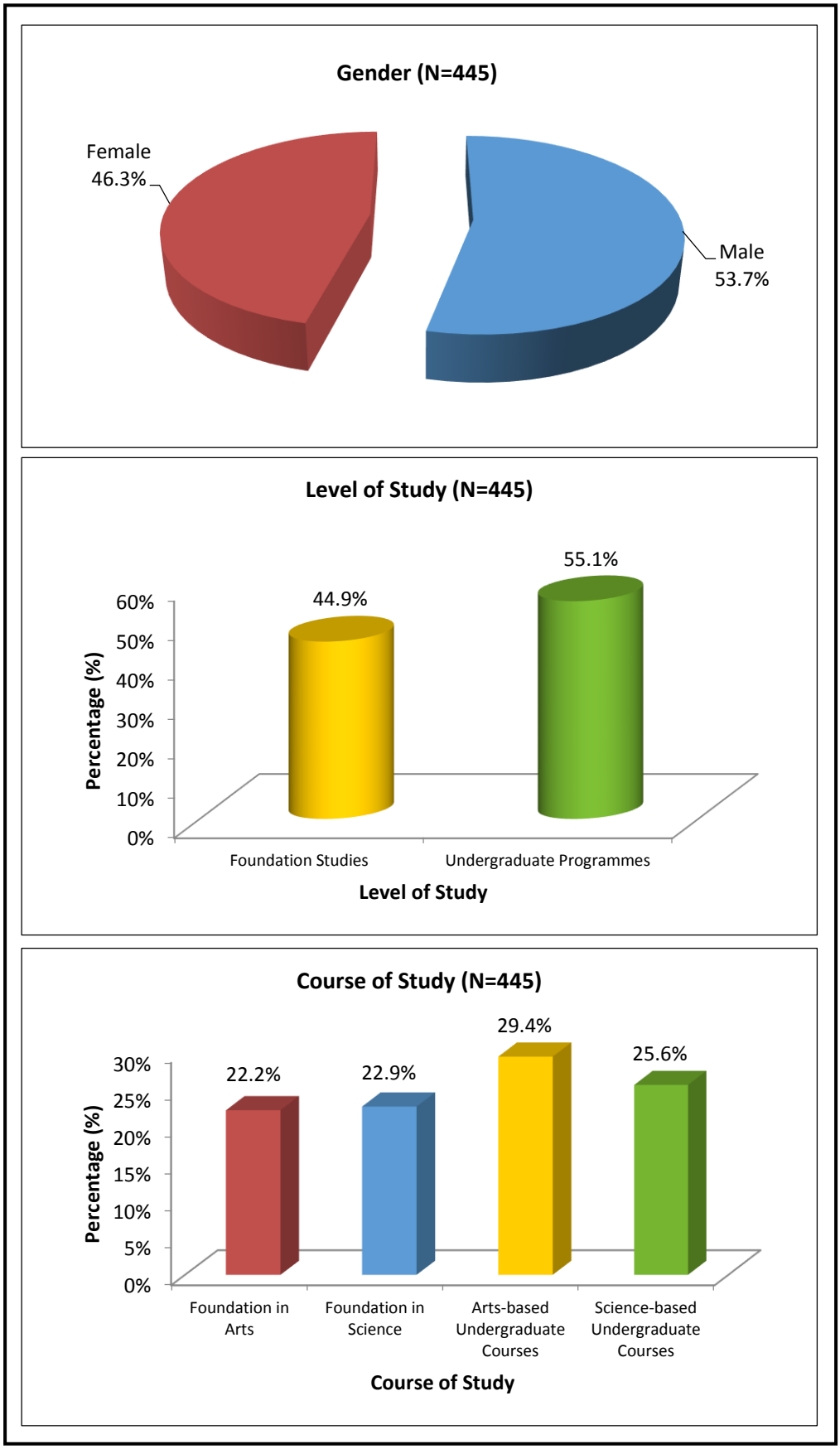

Figure 4.1: Respondents demographics

Before discussing the results of hypothesis to find out whether or not the respondent demographics could influence their perceptions on the usefulness and ease of use of the WBLE, the summary of the respondent demographics are presented in Figure 4.1.

4.2.1 Respondent Demographics: Gender

Participants were asked to indicate their gender by placing a tick next to the relevant option provided (i.e. Male or Female) in the questionnaire as appended in Appendix A. From the results shown in Figure 4.1, it was found that there were 239 (53.7%) males and 206 (46.3%) females.

4.2.2 Respondent Demographics: Level of Study

Participants were asked to tick the level of study that is appropriate to them. Of the 445 respondents, 200 of them (44.9 percent) were students from Foundation Studies, while the rest (245 or 55.1%) were pursuing their study in Undergraduate programmes as depicted in Figure 4.1.

4.2.3 Respondent Demographics: Course of Study

For the participants from Foundation studies, they were asked to indicate their course stream of study by placing a tick next to the relevant option provided (i.e. Foundation in Arts or Foundation in Science) in the questionnaire as appended in Appendix A. Meanwhile, participants from the

undergraduate courses were required to fill out their course of study such as Graphic Design and Multimedia, Broadcasting, Software Engineering, Computer Science, and so forth. The course of study for undergraduate courses was then categorised into two groups namely Arts-based undergraduate courses and Science-based undergraduate courses for analysis purposes.

From Figure 4.1, it can be seen that most of the respondents (131 or 29.4%) were studying in Arts-based undergraduate courses, followed by 114 (25.6%) respondents in Science-based undergraduate courses, 101 (22.7%) respondents from Foundation in Science, and 99 respondents (22.2%) from Foundation in Arts.

4.3 The Findings of Data Analysis on the Actual Usage of WBLE

This section presents the pattern and behaviour of the WBLE usage among respondents, which include the frequency of accessing WBLE and the average length of time they spent on WBLE each time they logged in to it. Besides, respondents were also asked to indicate the frequency of using the features integrated in WBLE and rate the usefulness for each feature. Moreover, this section also reveals the purpose of accessing WBLE and alternative learning tools that used by respondents.

4.3.1 Frequency of WBLE Access

Participants were asked to indicate their frequency of WBLE access. As revealed in Figure 4.2, majority of the respondents (62.9%) logged in to WBLE weekly, and followed by 135 (30.3%) of them who used WBLE daily. Besides, there were only 6.1% respondents that occasionally (e.g. at least once a month or once in a fortnight) accessed the WBLE, and less than 1% of the respondents hardly (e.g. once in a trimester) accessed the WBLE.

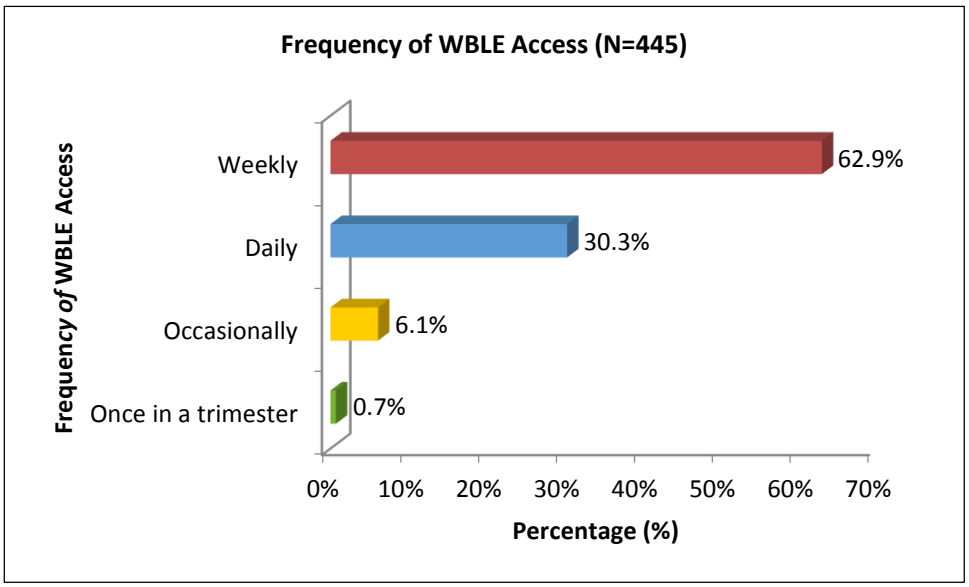

Figure 4.2: Frequency of WBLE access

The results of data analysis show that the use of WBLE among UTAR students was apparently high. This might due to WBLE that act as learning management system (LMS) in UTAR is a necessity supplementary and communication tools used in teaching and learning for a course. For example, WBLE serves as a platform for students to obtain course materials, and lecturers to announce the changes on class schedule, assignment submission dates, and so forth.

4.3.2 Average Length of Time Users Spent on the WBLE

On top of asking the frequency of WBLE access, the participants were also asked to indicate their average length of time spending on WBLE each time they logged in. From Figure 4.3, the findings indicate that majority of the respondents (47.4%) spent less than 15 minutes on WBLE each time they logged in. It followed by 187 respondents (42%) who spent 15 to 30 minutes on WBLE, The results also reveal that there were 47 respondents (10.6%) who spent time for more than 30-minute on WBLE each time they logged in.

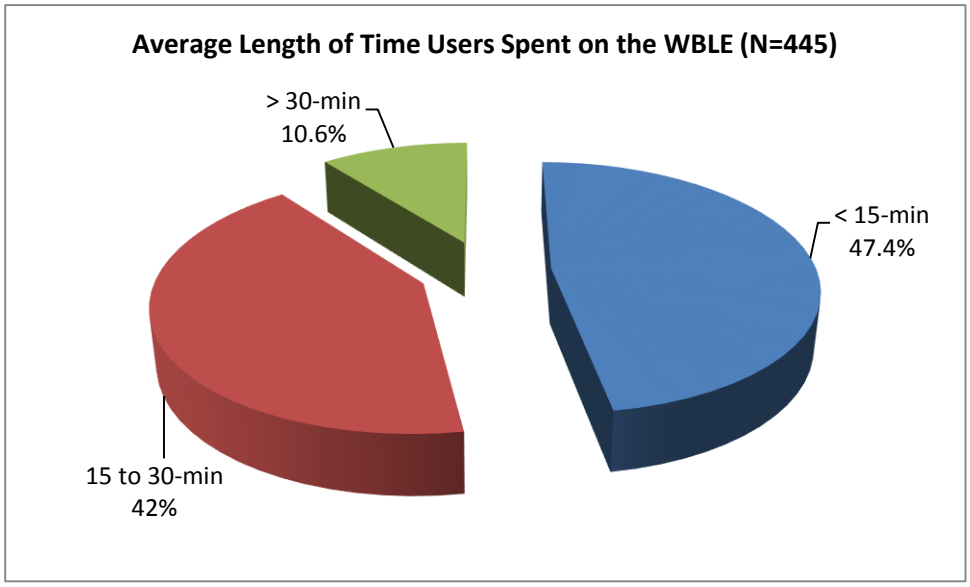

Figure 4.3: Average length of time user spent on WBLE

4.3.3 Purposes of Accessing WBLE

With respect to the purposes of assessing WBLE, Figure 4.4 reveals that almost all of the respondents (99.3%) accessed WBLE to download course materials. Then, 67.6% and 42.7% of them intended to check

announcement and upcoming events respectively. The results also indicate that there were only 3.4% and 2% of respondents used WBLE for online forum discussion and chat with lecturers or peers.

Apart from that, 3.6% of the respondents indicated that they used WBLE in other purposes, for examples doing online exercises, quizzes or tests, checking coursework marks, uploading assignments for submission, and checking the class schedule such as cancellation or replacement of classes.

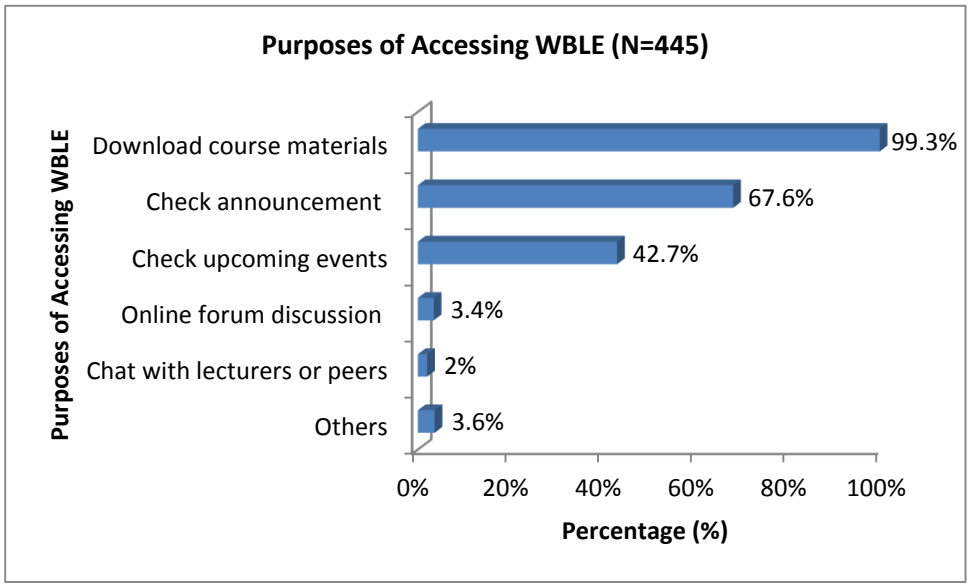

Figure 4.4: Purposes of accessing WBLE

The findings from this research are consistent with previous studies carried out by Cuban (2001), Milligan (2006) and Sakai-Pilot (2009) cited in Garcá-Peñalvo et al. (2011). These studies stated that LMS are not used properly and often are used as mere spaces to publish courses. The findings clearly show that LMS has become a repository for course material in UTAR context.

The findings also lend support to the study of Hamat et al. (2011) which claimed that e-learning in Malaysian HEIs, as supported by the existing LMS, is still focusing on the mechanical aspects of learning, such as content delivery. The challenge that must be addressed for the future is to make existing system drive and support more important aspects of learning such as creative learning and knowledge synthesis.

4.3.4 Respondent Preferences for Downloading Course Materials

In relation to the use of WBLE for downloading course materials, participants were asked to indicate their preferences for downloading them. For this item, 2 questionnaires were eliminated due to missing data. For this reason, 443 participants were included in the data analysis. The findings are depicted in Figure 4.5.

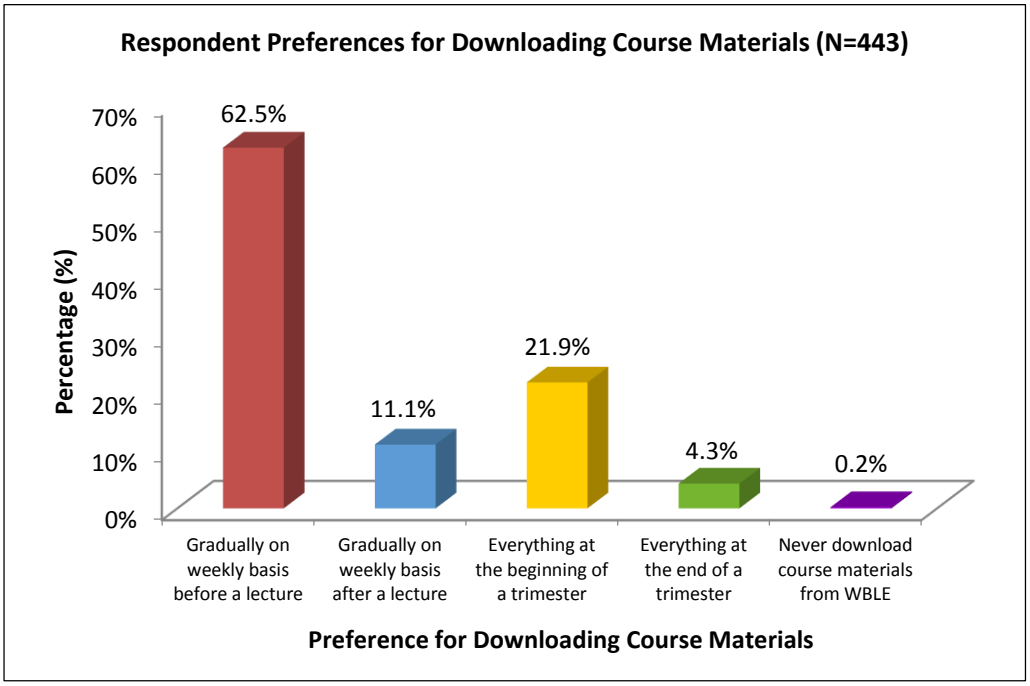

Figure 4.5: Preference for downloading course materials

As can be perceived through Figure 4.5, 277 (62.5%) of the respondents preferred to download course materials from WBLE gradually on weekly basis before a lecture. It is followed by 97 of the respondents (21.9%) who preferred to download everything at the beginning of a trimester, and 49 (11.1%) of them preferred to download course materials gradually on weekly basis after a lecture. Only 19 (4.3%) of them indicated that they preferred to download everything at the end of a trimester. However, there was a student (0.2%) noted that he never download course materials from WBLE.

The results of this research seem to parallel the findings of a study by Nordin et al. (2011) which indicated that students most preferred method to download course materials from WBLE is 'gradually on weekly basis before the lecture'. Thus, lecturer is suggested to upload relevant course materials such as lecture notes, assignments and tutorial into WBLE before a lecture.

4.3.5 Frequency of WBLE Features Usage

Participants were asked to indicate their frequency of using the common features that are available in WBLE. These features include Course Resources, Announcement, Grade List, Chat, Forum, Blog and Calendar. Figure 4.6 shows that the most frequently used WBLE features include:

- **Course Resources**: All the respondents had utilised this feature. Of the 444 respondents (1 questionnaire was eliminated due to missing data), 65.8% of the respondents used this feature at

least one a week, 25.7% used it at least once a day, and 8.6% used it at least once a month.

- **Announcement**: Of the 444 respondents (1 questionnaire was eliminated due to missing data), 53.4% of the respondents used this feature at least one a week, 20% used it at least once a day, and 19.8% used it at least once a month. The findings also reported that there were 6.8% of them who had never used this feature.
- **Grade List**: Less than half of the respondents claimed that they had utilised this feature. Of the 439 respondents (6 questionnaire was eliminated due to missing data), 40.3% of the respondents used this feature at least once a month, and 25.3% used it once a week. Only 3.9% of the respondents used it at least once a day. However, there were 30.5% of the respondents indicated that they had never used this feature.

Nonetheless, Figure 4.6 also reveals that more than half of the respondents noted that they have never used some features that are available in the WBLE. These underutilised features encompass Chat (80.2%), Forum (70%), Blog (64.4%) and Calendar (60.7%). The findings are consistent with the previous studies carried out by Garrote and Petersson (2007, cited in Fathema and Sutton, 2013), Hamat et al. (2011), and Nelson (2003, cited in Fathema and Sutton, 2013). These studies found that Chat is one of the underutilised components in LMS.

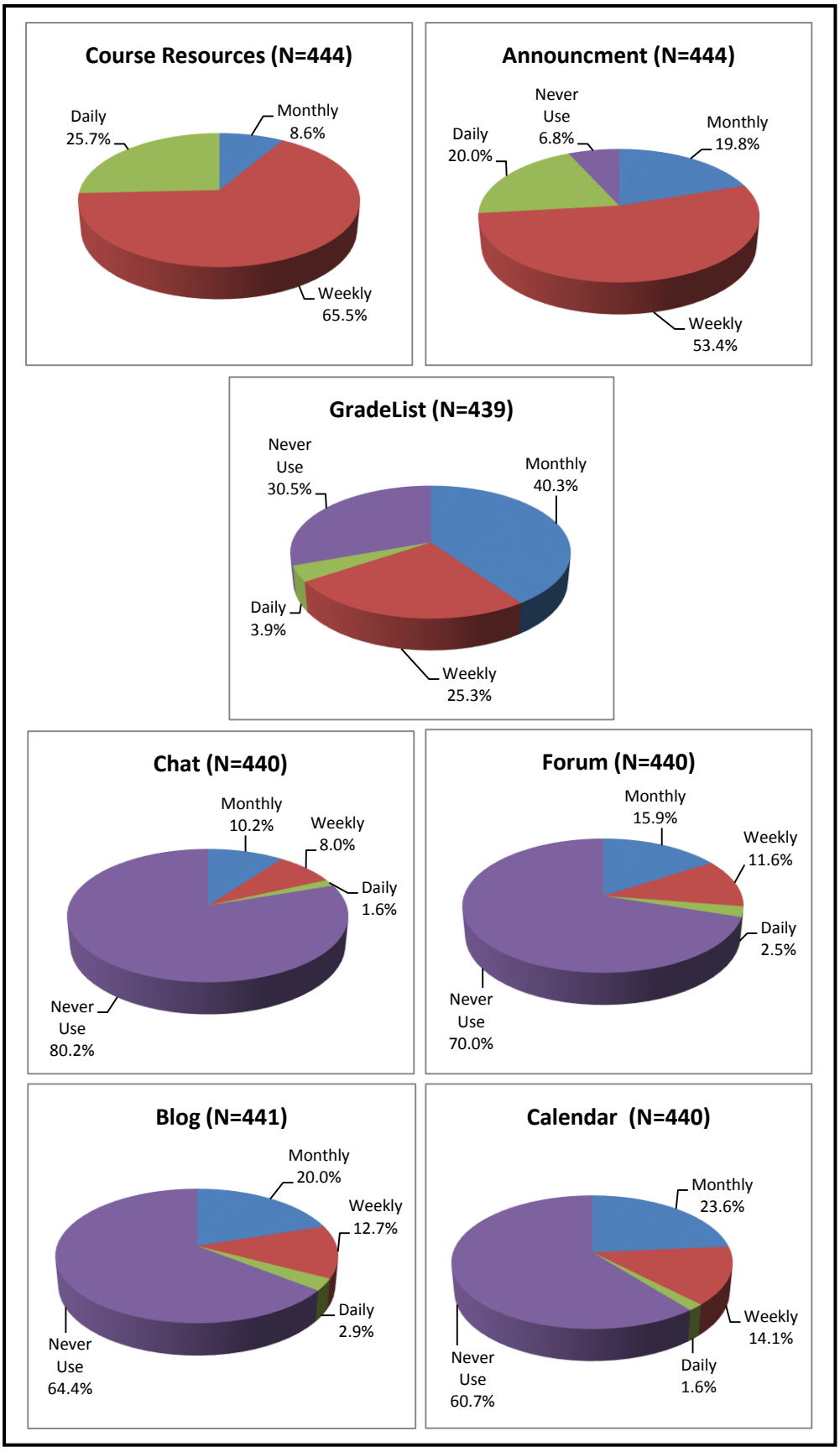

Figure 4.6: Frequency of WBLE features usage

4.3.6 The Usefulness Ratings of WBLE Features

On top of asking the participants to indicate the frequency of using the common features in WBLE, as presented in previous section, they were also asked to rate the usefulness of each feature.

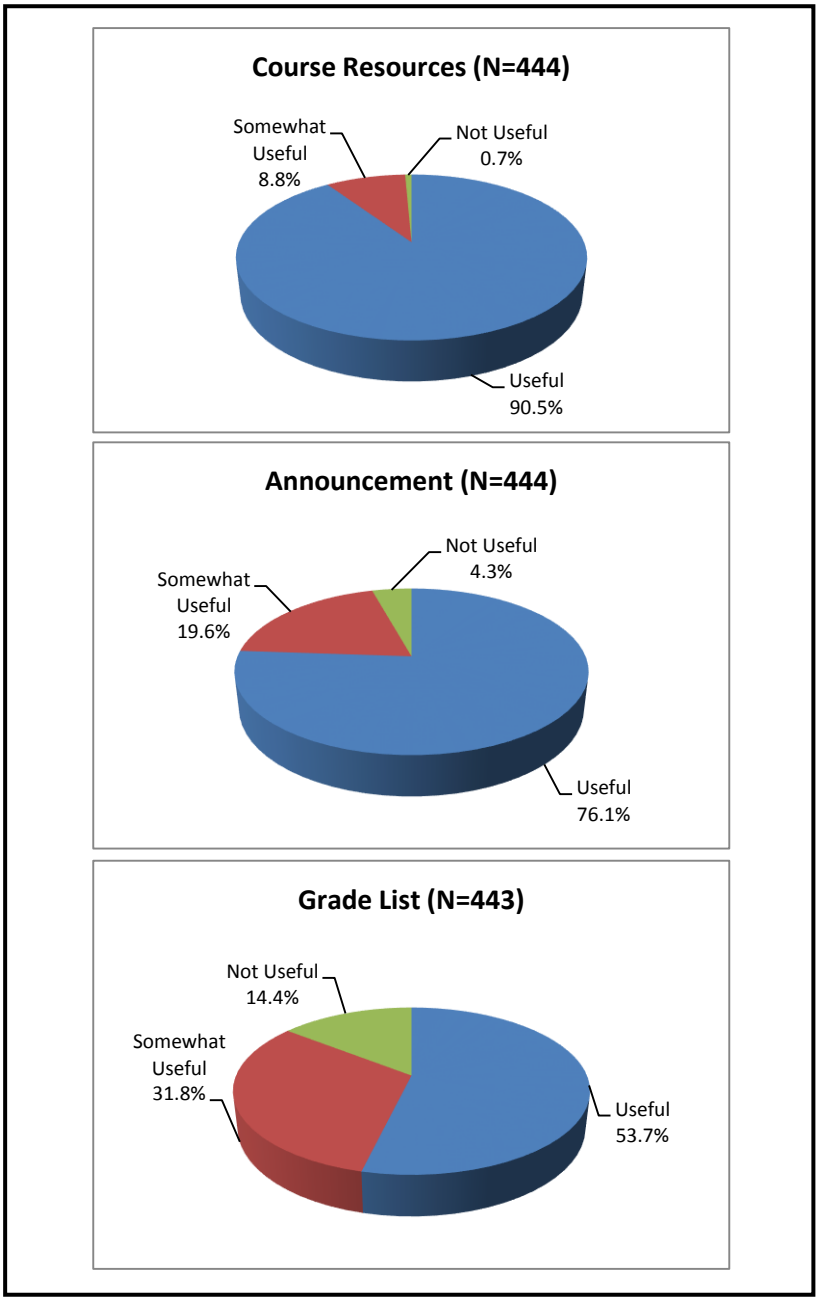

Figure 4.7: Useful features of WBLE

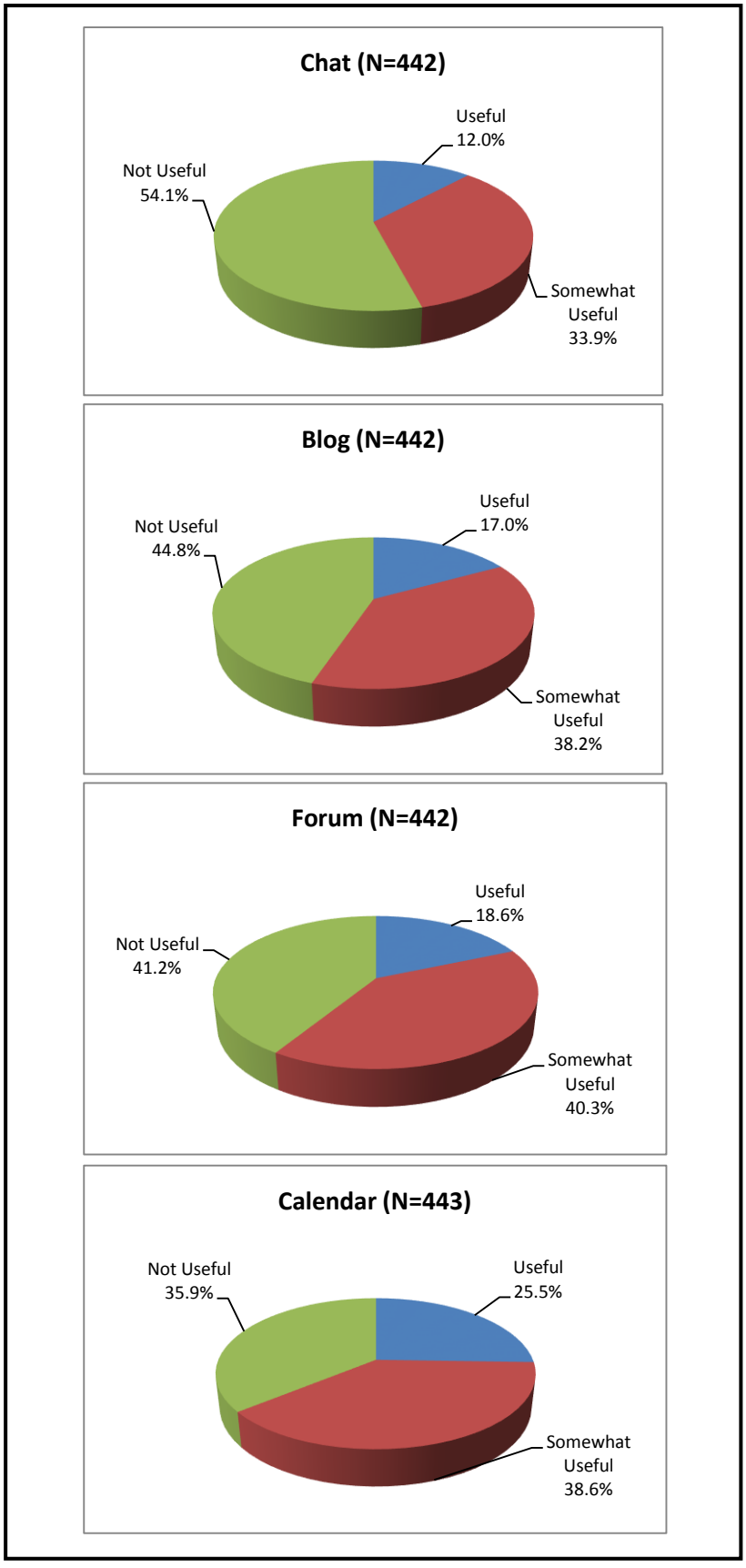

Figure 4.8: Less useful features of WBLE

As shown in Figure 4.7, among the three frequently used WBLE features, Course Resources is the most useful feature with high percentage of response rate (90.5%). It followed by Announcement (76.1%) and Grade List (53.7%).

Since Chat, Blog, Forum and Calendar were not frequently used by respondents as described in previous section, these features had also been rated as 'Not Useful' by some of the respondents. From Figure 4.8, it can be seen that more than half of the respondents (54.1%) noted that chat component in WBLE is not useful, followed by Blog (44.8%), Forum (41.2%), and Calendar (35.9%).

4.3.7 Other Online Technologies as Alternative Learning Tools to WBLE

Participants were asked to indicate other online technologies that had been used in learning as alternative tools to WBLE by placing a tick next to the relevant options provided in the questionnaire as appended in Appendix A. Figure 4.9 reveals that most of the respondents (66.1%) used Facebook as an alternative tool to WBLE for the purpose of learning. It followed by file storage service (e.g. Dropbox, Google Drive, Google Docs) (45.8%), and video sharing tools such as YouTube (44.9%).

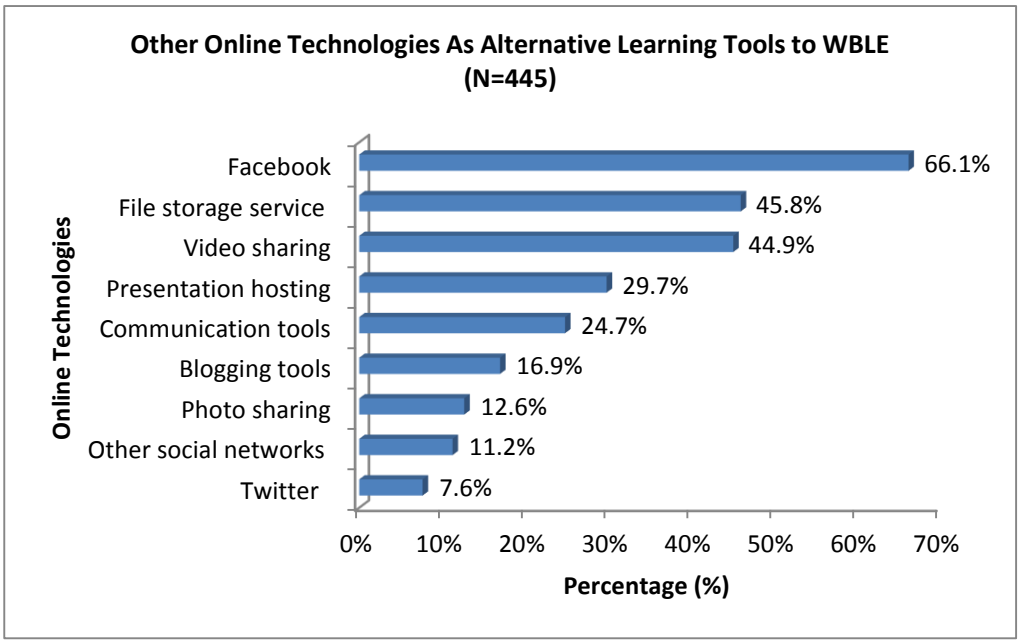

Figure 4.9: Other online technologies as alternative learning tools to WBLE

The results proved that Facebook was the most preferred online tool in UTAR for the purpose of learning, in addition to WBLE. The results are also in line with the findings of Irwin et al. (2012). Irwin et al. stated that students are receptive to incorporate Facebook into their academic lives and perceive benefits through enhanced communication, interaction, and flexibility in course content delivery. According to Bosch (2009, cited in Irwin et al., 2012), students are more engaged with Facebook compared to traditional university course sites. Further, Irwin et al. concluded that Facebook may be an excellent tool to integrate into the learning resources of university courses.

4.3.8 Additional Comments on WBLE

The "Any other comments on WBLE usage" general open question at the end of the questionnaire was provided for participants' additional

comments. It has the potential to elaborate responses to closed questions, and allow participants to identify new issues that are not captured in the closed questions.

Despite that students think that WBLE is easy to use, there are still some critiques made on the user interface design of WBLE. Some respondents felt that existing WBLE layout looks unappealing which needs an improvement. Besides, some of the respondents suggested that WBLE should be improved in a way that it is interactive like a social network site such as Facebook, especially the chat tool.

Apart from that, some respondents hoped that they would be notified whenever there is an update in WBLE, for example, receiving a notification email or SMS whenever a lecturer uploaded a new file or announcement, instead of constantly logging to WBLE to check the updates. The notification may ease the students in keeping track the latest news or events of a subject and prevent them from missing any important updates. For instance, some respondents claimed that they often missed out the announcement of a class cancellation which was conveyed through WBLE. They stated that the lecturer posted announcement on WBLE to cancel class early in the morning, but they only found it out later when they have already reached the campus.

Additional research is required to examine the reasons why students think that features such as Chat, Blog, Forum and Calendar are not useful and do not use it. Course of action should be taken to enhance these features as it

could possibly increase the overall perception of usefulness towards WBLE, thus encourage the student to fully utilize the system to attain more benefits from using LMS.

It is important to find out students' perceptions toward the LMS such as WBLE since it plays a vital role in the teaching and learning processes. Students' opinion should be taken into consideration in the LMS implementation as they are the one who actually use the system daily to support their learning purpose. A learning management system that caters to the needs and expectations of its end users would then attract and retain them to continue using the system.

4.4 The Findings of Hypotheses Testing

As described in chapter 1, seven hypotheses were formulated and used to verify the research objectives. The results the hypotheses testing are presented in this section.

4.4.1 The Findings of Hypothesis 1 (H1) Testing

The following null hypothesis was tested:

$H_0$1: UTAR students do not perceive that WBLE is useful and easy to use.

Two sub hypotheses were formed from the main null hypothesis 1 ($H_0$1), as follows:

$H_0$1a: UTAR students do not perceive that WBLE is useful.

$H_0$1b: UTAR students do not perceive that WBLE is easy to use.

As described in chapter 3, descriptive statistics seem to be the most appropriate method to test $H_0$1a and $H_0$1b. Mean (M), standard deviation (SD), frequency and percentage of cases were generated to determine the number of respondents who agreed or disagreed with each statement that measures perceived usefulness (i.e. PU1 through PU8) and perceived ease of use (i.e. PEOU1 through PEOU6) respectively.

4.4.1.1 Testing $H_0$1a

As $H_0$1a stated, users do not perceive that WBLE is useful. To test the real perceptions of users toward the usefulness of WBLE, the only way to know that is through user's degree of agreement with the statements that measure the perceived usefulness (PU). The means and standard deviations are reported in Table 4.1, whereas the frequency and percentage of responses are depicted in Table 4.2.

Table 4.1: Descriptive statistics of "Perceived Usefulness" evaluation among respondents (N=445)

Perceived Usefulness	*M*	*SD*
PU1: Using WBLE increases my productivity/ helps me to be a productive student.	3.43	0.88
PU2: Using WBLE enhances the effectiveness on the course coursework and my learning.	3.57	0.85
PU3: Using WBLE makes me easier to do the course coursework.	3.49	0.89
PU4: Using WBLE improves my study performance in this course.	3.24	0.90
PU5: WBLE makes me easier to learn in university.	3.48	0.90
PU6: WBLE gives me greater control over learning.	3.31	0.86
PU7: I find WBLE a useful tool for my learning in this course.	3.53	0.91
PU8: Overall, I find WBLE to be advantageous to my learning in this course.	3.56	0.85

As shown in Table 4.1, the mean score for each of the PU statements ranging from 3.24 to 3.57, which is above the midpoint (3) of the 5-point Likert scale. The findings are further elaborated in the subsequent paragraphs.

The results in Table 4.2 imply that the respondents found that WBLE is useful to them in the aspects of enhancing the effectiveness on their coursework and learning (M_{PU2} = 3.57, *SD* = 0.85), providing advantageous to their learning in the course (M_{PU8} = 3.56, *SD* = 0.85), serving as a useful tool for their learning in the course (M_{PU7} = 3.53, *SD* = 0.91), making them easier to do their coursework (M_{PU3} = 3.49, *SD* = 0.89), making them easier to learn in university (M_{PU5} = 3.48, *SD* = 0.90), increasing their productivity (M_{PU1} = 3.43, *SD* = 0.88), giving them greater control over learning (M_{PU6} = 3.31, *SD* = 0.86), and improving their study performance (M_{PU4} = 3.24, *SD* = 0.90).

Table 4.2: Frequency and percentage of responses for "Perceived Usefulness" evaluation among respondents (N=445)

Perceived Usefulness (PU)				
No.	**Statement**	**Response**	**Frequency**	**Percentage**
1.	Using WBLE increases my productivity/ helps me to be a productive student.	Strongly Agree	48	11
		Agree	156	35
		Neutral	187	42
		Disagree	46	10
		Strongly Disagree	8	2
2.	Using WBLE enhances the effectiveness on the course coursework and my learning.	Strongly Agree	49	11
		Agree	203	46
		Neutral	154	35
		Disagree	31	7
		Strongly Disagree	8	2
3.	Using WBLE makes me easier to do the course coursework.	Strongly Agree	50	11
		Agree	182	41
		Neutral	155	35
		Disagree	52	12
		Strongly Disagree	6	1
4.	Using WBLE improves my study performance in this course.	Strongly Agree	29	7
		Agree	143	32
		Neutral	197	44
		Disagree	60	14
		Strongly Disagree	16	4
5.	WBLE makes me easier to learn in university.	Strongly Agree	48	11
		Agree	185	42
		Neutral	154	35
		Disagree	48	11
		Strongly Disagree	10	2
6.	WBLE gives me greater control over learning.	Strongly Agree	35	8
		Agree	143	32
		Neutral	202	45
		Disagree	56	13
		Strongly Disagree	9	2
7.	I find WBLE a useful tool for my learning in this course.	Strongly Agree	58	13
		Agree	178	40
		Neutral	159	36
		Disagree	40	9
		Strongly Disagree	10	2
8.	Overall, I find WBLE to be advantageous to my learning in this course.	Strongly Agree	53	12
		Agree	191	43
		Neutral	159	36
		Disagree	37	8
		Strongly Disagree	5	1

Furthermore, the results as depicted in Table 4.2 and Figure 4.10 show that respondents who showed positive responses (either strongly agree or agree) toward all the statements that built into the PU construct are more than those who expressed negative responses (either strongly disagree or disagree) as follows:

- **PU1**: 46% of the respondents agreed with this statement (11% strongly agreed and 35% agreed) and 12% of them disagreed with it (2% strongly disagree and 10% disagree).
- **PU2**: 57% of the respondents agreed with this statement (11% strongly agreed and 46% agreed) and 9% of them disagreed with it (2% strongly disagree and 7% disagree).
- **PU3**: 52% of the respondents agreed with this statement (11% strongly agreed and 41% agreed) and 13% of them disagreed with it (1% strongly disagree and 12% disagree).
- **PU4**: 39% of the respondents agreed with this statement (7% strongly agreed and 32% agreed) and 18% of them disagreed with it (4% strongly disagree and 14% disagree).
- **PU5**: 53% of the respondents agreed with this statement (11% strongly agreed and 42% agreed) and 13% of them disagreed with it (2% strongly disagree and 11% disagree).
- **PU6**: 40% of the respondents agreed with this statement (8% strongly agreed and 40% agreed) and 15% of them disagreed with it (2% strongly disagree and 13% disagree).

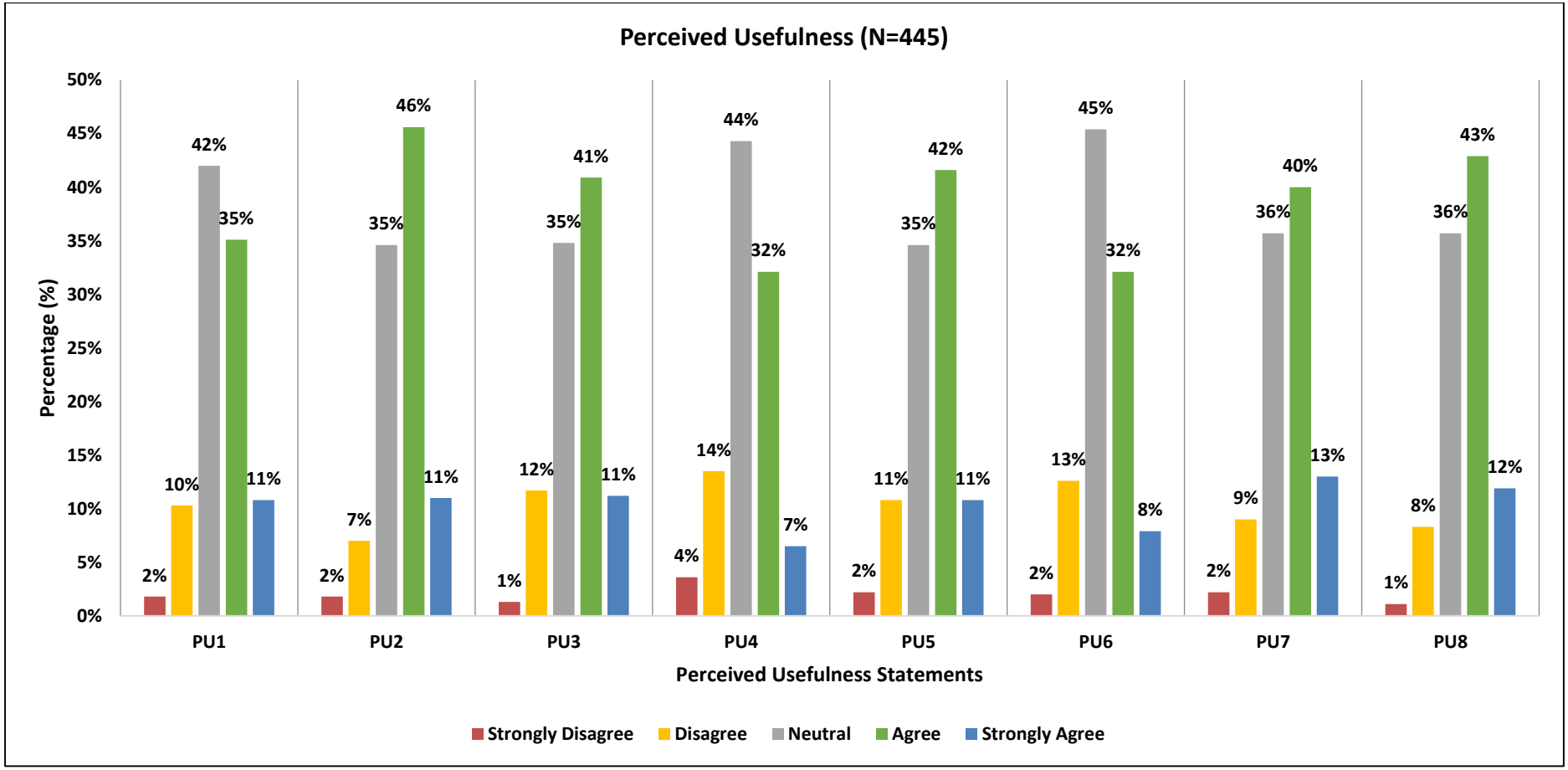

Figure 4.10: Percentage of responses for "Perceived Usefulness" evaluation among respondents

- **PU7**: 53% of the respondents agreed with this statement (8% strongly agreed and 40% agreed) and 15% of them disagreed with it (2% strongly disagree and 9% disagree).
- **PU8**: 55% of the respondents agreed with this statement (12% strongly agreed and 43% agreed) and 9% of them disagreed with it (1% strongly disagree and 8% disagree).

Based on the results shown in Table 4.1, since each statement that measure the PU construct possesses mean above 3.2, the findings indicate that the general perception of students towards the usefulness of WBLE is positive. Therefore, there was enough evidence to reject $H_0$1a. The findings show that, UTAR students perceive WBLE as useful.

4.4.1.2 Testing $H_0$1b

As $H_0$1b stated, users do not perceive that WBLE is easy to use. To test the real perceptions of users toward the ease of use of WBLE, the only way to know that is through user's degree of agreement with the statements that measure the perceived ease of use (PEOU). The means and standard deviations are reported in Table 4.3, whereas the frequency and percentage of responses are depicted in Table 4.4.

Table 4.3: Descriptive statistics of "Perceived Ease of Use" evaluation among respondents (N=445)

Perceived Ease of Use	*M*	*SD*
PEOU1: Learning to operate WBLE is easy for me.	3.92	0.87
PEOU2: I would find it easy to get WBLE to do what I want it to do.	3.56	0.93
PEOU3: My interaction with WBLE is clear and understandable.	3.74	0.84
PEOU4: It would be easy for me to become skilful at using WBLE.	3.58	0.90
PEOU5: My interaction with WBLE does not require a lot of mental effort.	3.82	0.94
PEOU6: Overall, I find WBLE easy to use.	3.95	0.89

As can be perceived through Table 4.3, the mean scores for each of the PEOU statements ranging from 3.56 to 3.95, which is greater than the midpoint (3) of the 5-point Likert scale. This means that the respondents show a high level of agreement and their answers range between agree and strongly agree.

The results in Table 4.3 indicate that the respondents found that WBLE is easy to use as a whole (M_{PEOU6} = 3.95, *SD* = 0.88). Likewise, students were collectively agreed that learning to operate WBLE is easy (M_{PEOU1} = 3.92, *SD* = 0.87), interaction with WBLE does not require a lot of mental effort (M_{PEOU5} = 3.82, *SD* = 0.94), interaction with WBLE is clear and understandable (M_{PEOU3} = 3.74, *SD* = 0.84), easy to become skilful at using WBLE (M_{PEOU4} = 3.58, *SD* = 0.90), and easy to get WBLE to do what they want it to do (M_{PEOU2} = 3.56, *SD* = 0.93).

Table 4.4: Frequency and percentage of responses for "Perceived Ease of Use" evaluation among respondents (N=445)

Perceived Ease of Use (PEOU)				
No.	**Statement**	**Response**	**Frequency**	**Percentage**
1.	Learning to operate WBLE is easy for me.	Strongly Agree	112	25
		Agree	213	48
		Neutral	100	23
		Disagree	11	3
		Strongly Disagree	9	2
2.	I would find it easy to get WBLE to do what I want it to do.	Strongly Agree	66	15
		Agree	178	40
		Neutral	155	35
		Disagree	33	7
		Strongly Disagree	13	3
3.	My interaction with WBLE is clear and understandable.	Strongly Agree	72	16
		Agree	221	50
		Neutral	120	27
		Disagree	27	6
		Strongly Disagree	5	1
4.	It would be easy for me to become skilful at using WBLE.	Strongly Agree	69	16
		Agree	170	38
		Neutral	167	38
		Disagree	30	7
		Strongly Disagree	9	2
5.	My interaction with WBLE does not require a lot of mental effort.	Strongly Agree	109	25
		Agree	191	43
		Neutral	110	25
		Disagree	26	6
		Strongly Disagree	9	2
6.	Overall, I find WBLE easy to use.	Strongly Agree	120	27
		Agree	217	49
		Neutral	82	18
		Disagree	17	4
		Strongly Disagree	9	2

In addition, the results shown in Table 4.4 and Figure 4.11 clearly reveal that more than half of the respondents showed positive responses (either strongly agree or agree) toward all the statements that built into the PEOU construct compared to those who gave negative responses (either strongly disagree or disagree) as follows:

- **PEOU1**: 73% of the respondents agreed with this statement (25% strongly agreed and 48% agreed) and 5% of them disagreed with it (2% strongly disagree and 3% disagree).
- **PEOU2**: 55% of the respondents agreed with this statement (15% strongly agreed and 40% agreed) and 10% of them disagreed with it (3% strongly disagree and 7% disagree).
- **PEOU3**: 66% of the respondents agreed with this statement (16% strongly agreed and 50% agreed) and 7% of them disagreed with it (1% strongly disagree and 6% disagree).
- **PEOU4**: 54% of the respondents agreed with this statement (16% strongly agreed and 38% agreed) and 9% of them disagreed with it (2% strongly disagree and 7% disagree).
- **PEOU5**: 68% of the respondents agreed with this statement (25% strongly agreed and 43% agreed) and 8% of them disagreed with it (2% strongly disagree and 6% disagree).
- **PEOU6**: 76% of the respondents agreed with this statement (27% strongly agreed and 49% agreed) and 6% of them disagreed with it (2% strongly disagree and 4% disagree).

Based on the results shown in Table 4.3, since each statement that measures the PEOU construct possesses mean above 3, the findings indicate that the general perception of students towards the ease of use of WBLE is positive. Therefore, there was enough evidence to reject $H_0$1b. In other words, UTAR students perceive that WBLE is easy to use.

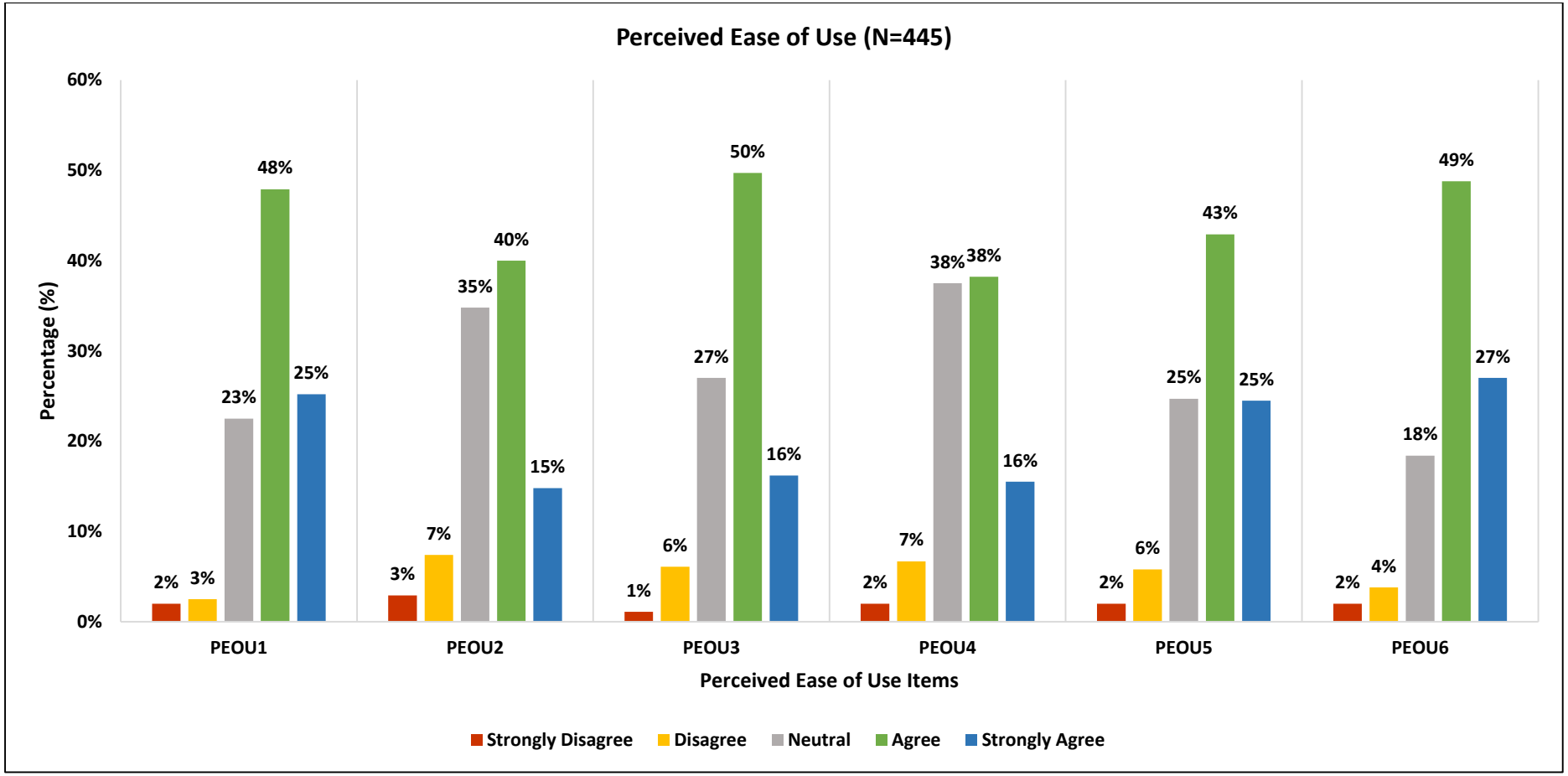

Figure 4.11: Percentage of responses for "Perceived Ease of Use" evaluation among respondent

4.4.1.3 Summary of $H_0$1 testing

Overall, the mean scores for all the statements that built into the PU and PEOU constructs are greater than the neutral point (3) (see Tables 4.1 and 4.3). In addition, the positive response rates (i.e. strongly agree and agree) for almost all of the statements in PU and PEOU scales were above 50%. These findings reflected that majority of the respondents were agreeable that the WBLE is useful and easy to use. Therefore, both the $H_0$1a and $H_0$1b could be rejected. Likewise, $H_0$1 was rejected. H1 has been substantiated indicating UTAR students perceive that WBLE is useful and easy to use.

The research findings are consistent with the findings of Azmi et al. (2012) in which majority (77.8%) of the participants from Universiti Sains Malaysia gave positive feedback towards e-learning when they were inquired whether or not the usage of e-LMS **(**e-Learning Management System) helps and facilitates their studies. Meanwhile, majority (74.9%) of the participants also agreed that the e-LMS is user friendly; they felt comfortable with the current interface. The findings also lend support to the findings of Almarashed et al. (2010) where the participants from Open University of Malaysia (OUM), University Tun Abdul Razak (UNITAR), University Putra Malaysia (UPM) and Univesitiy Sains Malaysia (USM) have positive perceptions toward the usefulness and ease of use of LMS in their universities respectively.

Nevertheless, the results depicted in Tables 4.1 and 4.3 clearly show that the mean scores for PEOU were generally higher than PU. As can be seen

from Table 4.1, majority of the respondents were neither agreed nor disagreed (neutral) with these two statements i.e. "Using WBLE improves my study performance in this course" (PU4) and "WBLE gives me greater control over learning". The mean scores for PU4 (M = 3.24) and PU6 (M = 3.31) deviate slightly from 3, which are closed to the midpoint of the 5-point Likert scale. This may due to not all the features of WBLE have been utilised to fullest extent. The findings imply that UTAR students felt that WBLE is easy to use more than perceiving it as useful in their studies.

4.4.2 The Findings of Hypothesis 2 (H2) Testing

The following null hypothesis was tested:

$H_0$2: UTAR students do not intend to use WBLE in their studies.

As described in chapter 3, descriptive statistics is regarded as the most appropriate method to test $H_0$2. Means (M), standard deviation (SD), frequency and percentage of cases were generated to determine the number of respondents who agreed and disagreed with each statement that measures the behavioural intention to use WBLE (i.e. BITU1 through BITU5).

As $H_0$2 stated, users do not intend to use WBLE in their studies. $H_0$2 could be tested based on the real behavioural intentions to use WBLE of the UTAR students; the only way to know that is through their degree of agreement with the statements that measure the behavioural intention to use

(BITU) WBLE. The means and standard deviations are reported in Table 4.5, whereas the frequency and percentage of responses are depicted in Table 4.6

Table 4.5: Descriptive statistics of "Behavioural Intention to Use" evaluation among respondents (N=445)

Behavioural Intention to Use	*M*	*SD*
BITU1: Assuming I have access to WBLE, I intend to use it.	3.56	0.81
BITU2: Given that I have access to WBLE, I plan to use it as much as possible.	3.36	0.86
BITU3: To the extent possible, I would use WBLE to do different things, from downloading course materials (e.g. lecture notes, etc.) and participating learning activities on the WBLE.	3.60	0.87
BITU4: I intend to increase my use of WBLE in the future.	3.35	0.85
BITU5: Overall, I have a positive perception towards using WBLE.	3.59	0.82

As shown in Table 4.5, the mean scores for each of the BITU statements ranging from 3.35 to 3.60, which is above the midpoint (3) of the 5-point Likert scale. The scale of Behavioural Intention to Use encompasses these five statements: "To the extent possible, I would use WBLE to do different things from downloading course materials and participating learning activities on WBLE" (M_{BITU3} = 3.60, *SD* = 0.87), "Overall, I have a positive perception towards using WBLE (M_{BITU5} = 3.59, *SD* = 0.82)", "Assuming I have access to WBLE, I intend to use it" (M_{BITU1} = 3.56, *SD* = 0.81), "Given that I have access to WBLE, I plan to use it as much as possible" (M_{BITU2} = 3.36, *SD* = 0.86), and "I intend to increase the use of WBLE in the future" (M_{BITU4} = 3.55, *SD* = 0.85).

In addition, the results as depicted in Table 4.6 and Figure 4.12 clearly present that respondents who show positive responses (either strongly agree or agree) toward all the statements that built into the BITU construct are more than those who expressed negative responses (either strongly disagree or disagree) as follows:

- **BITU1**: 58% of the respondents agreed with this statement (8% strongly agreed and 49% agreed) and 9% of them disagreed with it (2% strongly disagree and 7% disagree).
- **BITU2**: 45% of the respondents agreed with this statement (7% strongly agreed and 38% agreed) and 16% of them disagreed with it (2% strongly disagree and 14% disagree).
- **BITU3**: 60% of the respondents agreed with this statement (12% strongly agreed and 48% agreed) and 10% of them disagreed with it (2% strongly disagree and 8% disagree).
- **BITU4**: 42% of the respondents agreed with this statement (8% strongly agreed and 34% agreed) and 12% of them disagreed with it (2% strongly disagree and 10% disagree).
- **BITU5**: 58% of the respondents agreed with this statement (11% strongly agreed and 47% agreed) and 8% of them disagreed with it (1% strongly disagree and 7% disagree).

Table 4.6: Frequency and percentage of responses for "Behavioural Intention to Use" evaluation among respondents (N=445)

Behavioural Intention to use WBLE (BITU) in the future				
No.	**Statement**	**Response**	**Frequency**	**Percentage**
1.	Assuming I have access to WBLE, I intend to use it.	Strongly Agree	37	8
		Agree	220	49
		Neutral	150	34
		Disagree	30	7
		Strongly Disagree	8	2
2.	Given that I have access to WBLE, I plan to use it as much as possible.	Strongly Agree	32	7
		Agree	170	38
		Neutral	176	40
		Disagree	60	14
		Strongly Disagree	7	2
3.	To the extent possible, I would use WBLE to do different things, from downloading course materials (e.g. lecture notes, etc.) and participating learning activities on the WBLE.	Strongly Agree	53	12
		Agree	215	48
		Neutral	133	30
		Disagree	36	8
		Strongly Disagree	8	2
4.	I intend to increase my use of WBLE in the future.	Strongly Agree	35	8
		Agree	151	34
		Neutral	203	46
		Disagree	46	10
		Strongly Disagree	10	2
5.	Overall, I have a positive perception towards using WBLE.	Strongly Agree	48	11
		Agree	211	47
		Neutral	149	34
		Disagree	31	7
		Strongly Disagree	6	1

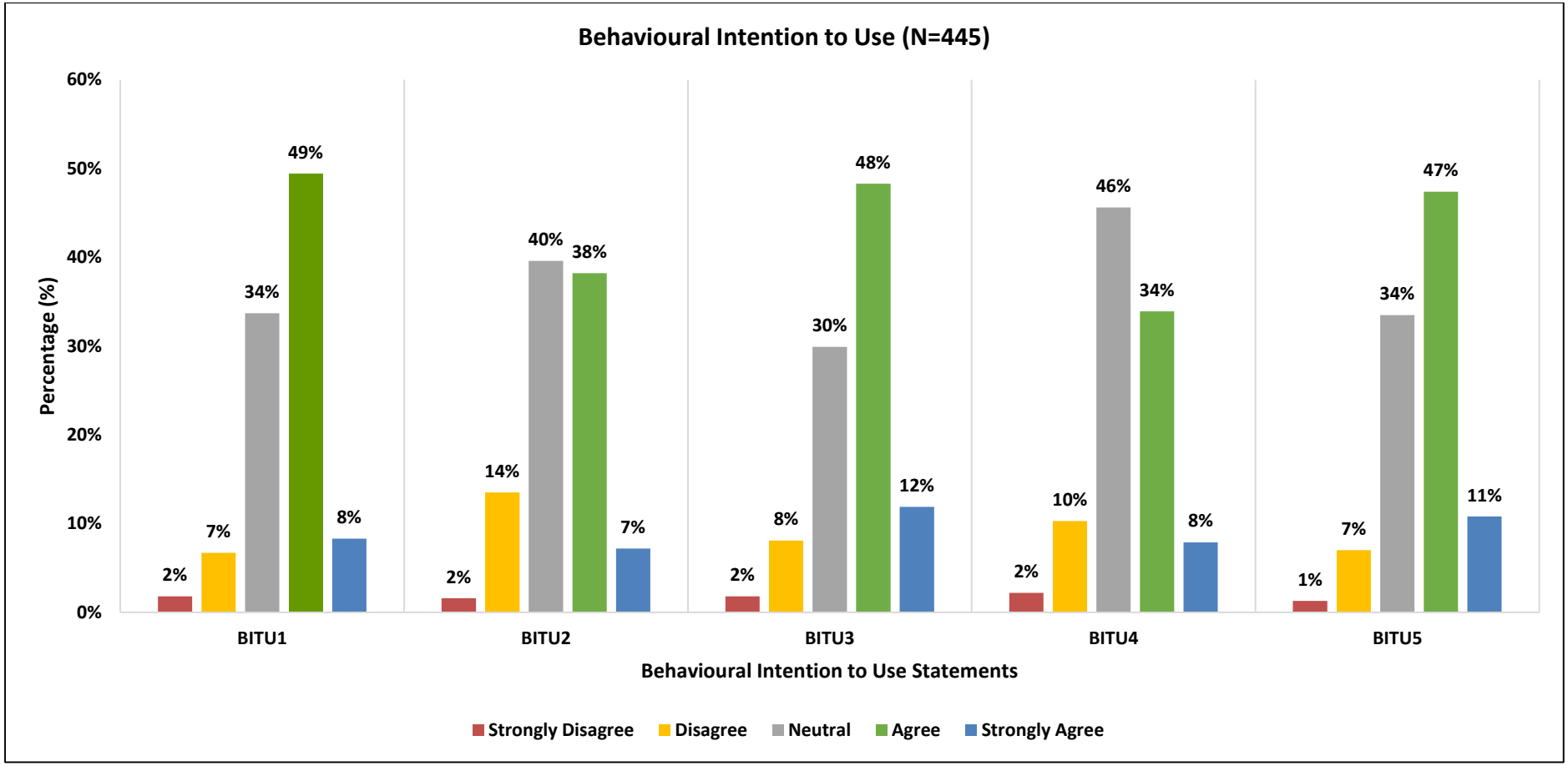

Figure 4.12: Percentage of responses for "Behavioural Intention to Use" evaluation among respondents

Based on the results shown in Table 4.5, since each statement that measures the BITU construct possess mean above 3.2, the findings indicate that UTAR students had shown positive behavioural intention to use WBLE in their studies. Hence, $H_0$2 could be rejected. The findings affirm that UTAR students intend to use WBLE in their studies. Since the students found that the WBLE is relatively useful and easy to use, thus there is no doubt that they intend to use WBLE in their studies. However, the correlation of PU and PEOU with BITU would be tested and is elaborated in section 4.4.5.

4.4.3 The Findings of Hypothesis 3 (H3) Testing

The following null hypothesis was tested:

$H_0$3: UTAR student demographics such as gender, level of study and course of study do not have any significant effects on perceived usefulness (PU) and perceived ease of use (PEOU) of WBLE.

From the third main null hypothesis 3 ($H_0$3), the following six sub hypotheses were formed:

$H_0$3a: UTAR students' gender does not have any significant effects on perceived usefulness (PU) of WBLE.

$H_0$3b: UTAR students' gender does not have any significant effects on perceived ease of use (PEOU) of WBLE.

$H_0$3c: UTAR students' level of study does not have any significant effects on perceived usefulness (PU) of WBLE.

$H_0$3d: UTAR students' level of study does not have any significant effects on perceived ease of use (PEOU) of WBLE.

$H_0$3e: UTAR students' course of study does not have any significant effects on perceived usefulness (PU) of WBLE.

$H_0$3f: UTAR students' course of study does not have any significant effects on perceived ease of use (PEOU) of WBLE.

As described in chapter 3, the independent samples t-test was used to test $H_0$3a through $H_0$3d to examine if there are significant differences between male and female students, so as the foundation studies and undergraduate students, in terms of perceiving the usefulness and ease of use of WBLE. On the other hand, the one-way ANOVA test was used to examine if the course of study statistically affecting the students' perceptions of usefulness and ease of use of the WBLE.

4.4.3.1 Testing $H_0$3a

As $H_0$3a stated, students' gender does not have any significant effect on the perceived usefulness (PU) of WBLE. The independent samples t-test was used to examine if there is a significant difference between male and female students' perceived usefulness of WBLE. The results are shown in Tables 4.7 and 4.8.

Table 4.7: Descriptive statistics for Perceived Usefulness and students' gender

Perceived Usefulness

Gender	N	M	SD
Male	239	3.45	0.74
Female	206	3.45	0.71

Table 4.8: T-test results for Perceived Usefulness and students' gender

Perceived Usefulness	Levene's Test for Equality of Variance		T-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	0.165	0.685	0.081	443	0.936
Equal variances not assumed			0.081	437.811	0.936

Note:
According to Hanna and Dempster (2012), the value of equal variance assumed is applicable if the significance of the Levene's test is high (greater than 0.05). Since the p-value for Levene's test is large (p = 0.685), we can assume that the assumption of equal variances is not violated.

As the p-value was very large (p = 0.936) which indicates that there was no significant difference in the two means, therefore, there was not enough evidence to reject $H_0$3a (p > 0.05) (see Tables 4.7 and 4.8). Hence, there was no significant difference between male and female students' perceived usefulness of WBLE.

4.4.3.2 Testing $H_0$3b

As $H_0$3b stated, students' gender does not have any significant effects on the perceived ease of use (PEOU) of WBLE. The independent samples t-test was used to examine if there is a significant difference between male and female students' perceived ease of use of WBLE. The results are reported in Tables 4.9 and 4.10.

Table 4.9: Descriptive statistics for Perceived Ease of Use and students' gender

Perceived Ease of Use

Gender	N	M	SD
Male	239	3.74	0.82
Female	206	3.79	0.68

Table 4.10: T-test results for Perceived Ease of Use and students' gender

Perceived Usefulness	Levene's Test for Equality of Variance		T-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	5.347	0.021	-0.702	443	0.483
Equal variances not assumed			-0.711	442.346	0.477

Note:
According to Hanna and Dempster (2012), the value of equal variance assumed is applicable if the significance of the Levene's test is high (greater than 0.05). Since the p-value for Levene's test is low (p = 0.021), we can assume that the assumption of equal variances is violated.

The p-value was rather large (p = 0.477) indicating that there was not enough evidence to reject $H_0$3b (p > 0.05) (see Tables 4.9 and 4.10). Thus male and female teachers were in agreement on the perceived ease-of-use of WBLE.

4.4.3.3 Testing $H_0$3c

As $H_0$3c stated, students' level of study does not have any significant effects on the perceived usefulness (PU) of WBLE. The independent samples t-test was used to examine if there is a significant difference between foundation studies and undergraduate students in terms of perceiving the usefulness of WBLE. The results are depicted in tables 4.11 and 4.12.

Table 4.11: Descriptive statistics for Perceived Usefulness and students' level of study

	Perceived Usefulness		
Level of study	N	M	SD
Foundation studies	200	3.43	0.68
Undergraduate	245	3.47	0.76

Table 4.12: T-test results for Perceived Usefulness and students' level of study

Perceived Usefulness	Levene's Test for Equality of Variance		T-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	2.942	0.087	-0.448	443	0.655
Equal variances not assumed			-0.453	439.635	0.651

Note:
According to Hanna and Dempster (2012), the value of equal variance assumed is applicable if the significance of the Levene's test is high (greater than 0.05). Since the p-value for Levene's test is large (p = 0.087), we can assume that the assumption of equal variances is not violated.

The p-value was 0.655 indicating that there was not enough evidence to reject $H_0$3c ($p > 0.05$) (see Tables 4.11 and 4.12). Hence, the level of study did not have any significant effects on perceived usefulness of WBLE. Both Foundation studies and undergraduate students were in agreement on the usefulness of the WBLE.

4.4.3.4 Testing $H_0$3d

As $H_0$3d stated, students' level of study does not have any significant effects on perceived ease of use (PEOU) of WBLE. The independent samples t-test was used to examine if there is a significant difference between foundation studies and undergraduate students in terms of perceiving the ease of use of WBLE. The results are revealed in tables 4.13 and 4.14.

Table 4.13: Descriptive statistics for Perceived Ease of Use and students' level of study

Perceived Ease of Use

Level of study	N	M	SD
Foundation studies	200	3.71	0.51
Undergraduate	245	3.81	0.50

Table 4.14: T-test results for Perceived Ease of Use and students' level of study

Perceived Ease of Use	Levene's Test for Equality of Variance		T-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	1.580	0.209	-1.416	443	0.157
Equal variances not assumed			-1.427	436,148	0.154

Note:
According to Hanna and Dempster (2012), the value of equal variance assumed is applicable if the significance of the Levene's test is high (greater than 0.05). Since the p-value for Levene's test is large (p = 0.209), we can assume that the assumption of equal variances is not violated.

The p-value was 0.157 indicating that there was not enough evidence to reject $H_0$3d ($p > 0.05$). Hence, the level of study had no significant effects on perceived ease of use of WBLE. Foundation studies and undergraduate students agreed on the ease of use of the WBLE.

4.4.3.5 Testing $H_0$3e

$H_0$3e stated that students' course of study does not have any significant effects on perceived usefulness (PU) of WBLE. The one-way ANOVA test was used to analyse whether or not the course of study (i.e. Foundation in Arts, Foundation Science, Arts-based undergraduate courses and Science-based undergraduate courses) has significant significant effects on students'

perceived usefulness of WBLE. The results are reported in Tables 4.15 and 4.16.

Table 4.15: Descriptive statistics for Perceived Usefulness and students' course of study

Perceived Usefulness

Course of Study	N	M	SD
Foundation in Arts	99	3.39	0.70
Foundation in Science	101	3.48	0.65
Arts-based undergraduate courses	131	3.41	0.73
Science-based undergraduate courses	114	3.53	0.80

Table 4.16: ANOVA results for Perceived Usefulness and students' course of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
PU * Course	Between Groups	1.555	3	0.518	0.987	0.398
	Within Groups	231.534	441	0.525	0.987	

The p value was rather large ($p = 0.398$) indicating that $H_0$3e could not be rejected ($p > 0.05$) (see Tables 4.15 and 4.16). Hence, the course of study had no significant effects on students' perceived usefulness of the WBLE. Thus, whatever students' course of study, they were in agreement on the perceived usefulness of WBLE.

4.4.3.6 Testing $H_0$3f

$H_0$3f stated that students' course of study does not have any significant effects on perceived ease of use (PEOU) of WBLE. The one-way ANOVA test was used to examine whether or not the different courses of study have

significant effects on students perceived ease of use of WBLE. The results are shown in Tables 4.17 and 4.18).

Table 4.17: Descriptive statistics for Perceived Ease of Use and students' course of study

Perceived Ease of Use

Course of Study	N	M	SD
Foundation in Arts	99	3.67	0.73
Foundation in Science	101	3.74	0.71
Arts-based undergraduate courses	131	3.75	0.67
Science-based undergraduate courses	114	3.87	0.75

Table 4.18: ANOVA results for Perceived Ease of Use and students' course of study

ANOVA Table		Sum of Squares	df	Mean Square	F	Sig.
PEOU * Course	Between Groups	2.283	3	0.761	1.341	0.260
	Within Groups	250.246	441	0.567		

The p value was rather large ($p = 0.260$) indicating that there was not enough evidence to reject $H_0$3f ($p > 0.05$) (see Tables 4.17 and 4.18). Thus, the students from all courses of study agreed on the ease of use of WBLE.

4.4.3.7 Summary of $H_0$3 testing

The results of the null hypotheses ($H_0$3a and $H_0$3b) testing reported that there was no significant difference between male and female students in their perceptions toward the usefulness and ease of use of WBLE. The results are in accordance with the findings of Wong et al. (2012). Wong et al. claimed that this may be due to the fact that "computers-in-education have permeated the

everyday lives of pre-service teachers and differences in the use between male and female have been narrowed till it was no longer be significant" (p. 1203).

In regard to the level of study, the findings from the testing of $H_0$3c and $H_0$3d testing have proven that there was no significant difference between Foundation studies students' and undergraduate students' perceived usefulness and ease of use of WBLE. They were in agreement on the usefulness and ease of use of WBLE. These findings are consistent with the study of Afari-Kumah and Achampong (2010). Afari-Kumah and Achampong stated that level of student do not affect a student's perception of how easy it is to use the computer. This could be a "reflection of the determination of students to learn to use the computer regardless of their level" (p. 113). Afari-Kumah and Achampong further added that it is necessary to note the weakness of the insignificant relationship between PU and level of student, suggesting that other external variables such as cost of a personal computer and income levels of families have to be looked at.

Besides, Agarwal and Prasad (1999) believed that level of study did not have effect on PU might be that for a large number of the users, the added functionality of the interface had simply not been "discovered" yet, and hence, they did not perceived its value differently. Although Agarwal and Prasad did found a relationship between level of study and PEOU, however, they did not use student as the samples of their study. Corporate user and student may have different points of views, and the findings may be affected by other unknown variables.

Apart from that, the findings of $H_0$3e and $H_0$3f testing reported that the course of study had no significant effects on students' perceived usefulness and ease of use of WBLE. The result is contrary to prior research, which investigated the impact of course/programme on users' perceptions toward technology. One plausible cause is that almost all the UTAR students from different courses used WBLE to download course materials or check announcement (see Figure 4.6).

In conclusion, all students regardless of their gender, level of study and course of study agreed on the usefulness and ease of use of WBLE. According to Shiratuddin (2002), "A software should be easy to use and easy to learn by different groups of user, for instance, experienced and novice users, male and female users, and so on: (p. 238). This is in line with Molich and Nielsen's (1990) statement that "Any system designed for people to use should be easy to learn and remember, effective, and pleasant to use (p. 338). Thereby, WBLE may be considered as a successful LMS that was perceived by different students of different gender, level of study and course of study as useful and easy to use.

4.4.4 The Findings of Hypothesis 4 (H4) Testing

The following null hypothesis was tested:

$H_0$4: There is no significant relationship between perceived ease of use and perceived usefulness of WBLE.

As described in chapter 3, Pearson's Correlation Coefficient (r) was used to test the null hypothesis 4 ($H_0$4). Pearson's Correlation Coefficient was utilised to study the relationships between perceived ease of use (PEOU) and perceived usefulness (PU) of WBLE. The results are shown in Tables 4.19 and 4.20.

Table 4.19: Descriptive statistics for Perceived Ease of Use and Perceived Usefulness

	N	M	SD
PEOU	445	3.76	0.75
PU	445	3.45	0.73

Table 4.20: Correlation between Perceived Ease of Use and Perceived Usefulness (N=445)

		PEOU	PU
PEOU	Pearson Correlation	1.00	0.598**
	Sig. (2-tailed)		0.000
	N	445	445
PU	Pearson Correlation	0.598**	1.00
	Sig. (2-tailed)	0.000	
	N	445	445

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

The p-value was found to be highly significant ($r = 0.598$, $p < 0.01$) (see Tables 4.19 and 4.20). Therefore there was strong evidence to reject the null hypothesis ($H_0$4). Perceived ease of use (PEOU) was positively correlated with perceived usefulness (PU) ($r = 0.598$). The findings indicate that UTAR students who perceived the WBLE as easy to use also perceived it as useful. The findings are in line with previous technology acceptance studies (e.g. Almarashdeh et al., 2010, 2011; Alatawi et al., 2014; Chang and Tung, 2008; Farahat, 2012; Grandon et al., 2005; Landry et al., 2006; Park, 2009; Punnoose,

2012; Theng et al., 2008; Zhang et al., 2008), which also demonstrated a significant relationship between a user's perceived ease of use and a user's perceived usefulness.

Almarashdeh et al (2010, 2011) showed that PEOU has significant impact on PU of LMS. Chang and Tung (2008) and Grandon et al. (2005) studies showed that PEOU has a positive direct effect on PU of e-learning. Landry et al. (2006) and Theng et al. (2008) concluded that if students find e-learning system easy to use, they might consider it as a useful learning tool. Farahat (2012) further added that "PEOU among students may diminish their PU and their positive attitude towards using online learning, and in turn decline their intention to practice online learning" (p. 99). While Punnoose (2012) found that PEOU had direct effect on PU and thus affected the intention to study with e-Learning. Hence, Punnoose claimed that increment in the perception that the technical system is easy to use is necessary to increase intention to study with e-learning.

Besides, Alatawi et al. (2014) indicated that the strong and significant relationship between PEOU and PU indicates how important it is for the system to be perceived as user-friendly and easy to use in order to be perceived useful by its users. Alatawi et al. further proposed that users' computer and Internet expertise can be used for sharing their point of views with designers and developers of the system for its better interface design purposes. Moreover, the top management of the organisations should make proper arrangement of training to use specific systems in such a way that users can perceive to use it

in their day-to-day functioning, which leads them to understand the usefulness and benefits provided by the system and could enhance their overall job performance.

4.4.5 The Findings of Hypothesis 5 (H5) Testing

The following null hypothesis was tested:

$H_0$5: There is no significant relationship between perceived usefulness and behavioural intention to use WBLE.

As described in chapter 3, Pearson's Correlation Coefficient (r) was used to test the null hypothesis 5 ($H_0$5). Pearson's Correlation Coefficient was utilised to study the relationship between perceived usefulness (PU) and behavioural intention to use (BITU) WBLE. The results are shown in Tables 4.21 and 4.22.

Table 4.21: Descriptive statistics for Perceived Usefulness and Behavioural Intention to Use

	N	M	SD
PU	445	3.45	0.73
BITU	445	3.49	0.70

Table 4.22: Correlation results between Perceived Usefulness and Behavioural Intention to Use WBLE (N=445)

		PU	BITU
PU	Pearson Correlation	1.00	0.626**
	Sig. (2-tailed)		0.000
	N	445	445
BITU	Pearson Correlation	0.626**	1.00
	Sig. (2-tailed)	0.000	
	N	445	445

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

The p-value was found to be highly significant ($r = 0.626$, $p < 0.01$) (see Tables 4.21 and 4.22). Therefore there was strong evidence to reject the null hypothesis ($H_0 5$). Perceived usefulness (PU) was positively correlated with behavioural intention to use (BITU) WBLE ($r = 0.626$). UTAR students who perceived the WBLE as being useful will increase their behavioural intention to use WBLE in studies.

The findings are consistent with the empirical studies of Almarashdeh et al., 2010, 2011; Alatawi et al., 2014; Baleghi-Zadeh et al., 2014; Chang and Tung (2008), Farahat (2012), Premchaiswadi and Porouhan (2012), Punnoose (2012), Sharma and Chandel (2013), Theng et al. (2008), and Zhang et al. (2008).

Farahat (2012), Premchaiswadi and Porouhan (2012) and Zhang et al. (2008) consistently discovered that intention to use an online learning system to learn is positively affected by "Perceived Usefulness". While Almarashdeh et al. (2010, 2011) and Baleghi-Zadeh et al. (2014) indicated that PU has a significant impact on behavioural inention to use LMS. Chang and Tung (2008), and Sharma and Chandel (2013) indicated that a perception among students using websites for learning that higher perceived usefulness results in more behavioural intention to use online learning course websites. This can be explained by Alatawi et al. (2014), where users are more likely to use the systems if they believe that such systems are more beneficial and useful in their day-to-day workings and if their performance is going to enhance due to the use of such systems.

Furthermore, Theng et al. (2008) asserted that in relation to specific learning activities, perceptions of usefulness significantly influenced intentions to use an e-learning system for accessing course documents, communication with classmates and tutors, collaboration with classmates, submission of course assignments, review and critique others' work and use for self-directed learning purposes.

Also, Punnoose (2012) claimed that "perception of usefulness is strongest for individual, in the following order of decreasing important, who (i) perceive the e-learning system to be easy to use, (ii) judge their computer skills to be good, (iii) value the opinions and suggestions of those close to them, (iv) are achievement oriented, careful, and thorough, (v) are talkative, energetic, and enthusiastic, and (vi) are emotionally stable and less reactive to stress" (p. 319). Thus, Punnoose suggested that perceptions of the technical system are useful for studying should be increased in order to increase the intention to study with e-Learning.

4.4.6 The Findings of Hypothesis 6 (H6) Testing

The following null hypothesis was tested:

$H_0$6: There is no significant relationship between perceived ease of use and behavioural intention to use WBLE.

As described in chapter 3, Pearson's Correlation Coefficient (r) was used to test the null hypothesis 6 ($H_0$6). Pearson's Correlation Coefficient was utilised to study the relationships between perceived ease of use (PEOU) and

behavioural intention to use (BITU) WBLE. The results are shown in Tables 4.23 and 4.24.

Table 4.23: Descriptive statistics for Perceived Ease of Use and Behavioural Intention to Use

	N	M	SD
PEOU	445	3.76	0.75
BITU	445	3.49	0.70

Table 4.24: Correlation results between Perceived Ease of Use and Behavioural Intention to Use (N=445)

		PEOU	BITU
PEOU	Pearson Correlation	1.00	0.597**
	Sig. (2-tailed)		0.000
	N	445	445
BITU	Pearson Correlation	0.597**	1.00
	Sig. (2-tailed)	0.000	
	N	445	445

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

The p-value was found to be highly significant ($r = 0.597$, $p < 0.01$) (see Tables 4.23 and 4.24). Therefore there was a strong evidence to reject null hypothesis ($H_0 6$). Perceived ease of use (PEOU) was positively correlated with behavioural intention to use (BITU) WBLE. The findings imply that UTAR students who perceived the WBLE as easy to use will increase their behavioural intention to use WBLE in studies.

The findings concur with several studies including Almarashdeh et al. (2010, 2011), Alatawi et al. (2014), Baleghi-Zadeh et al. (2014), Chang and Tung, (2008), Premchaiswadi and Porouhan (2012), Sharma and Chandel (2013), Theng et al. (2008), and Zhang et al. (2008).

Chang and Tung (2008), and Premchaiswadi and Porouhan (2012) concluded that perceived ease of use is a significant determinant of intention to use an e-learning system. In particular Almarashdeh et al. (2010, 2011), Alatawi et al. (2014), and Baleghi-Zadeh et al. (2014) stated that PEOU has a significant impact on the intention to use LMS. Premchaiswadi and Porouhan added that the degree to which a student believed that using an e-learning system will require little effort is important in acceptance of e-learning. They relate it to numerous psychological, cultural or lifestyle factors.

While the result in Zhang et al. (2008) study stated that PEOU helps students accept the importance of the system to their study performance. Alatawi et al. further explained that easier system is more likely to be adopted by the users than the complex and cumbersome systems. Alatawi et al. further stated that a system need to be user friendly and its exploration has to be effortless, otherwise users of such system would not adopt or use it even though it is useful as this is a human nature to use easier system.

Punnoose (2012) indicated that the "perception of ease of use is strongest for individuals, in the following order of decreasing importance, who (i) judge their computer skills as good, and (ii) are talkative, energetic, and enthusiastic; these effects are positive, medium, and direct" (p. 320). In addition, Theng et al. (2008) asserted that perception of ease of use towards an e-learning system had significant influence on "the intention to use the edveNTure (e-learning system) to access course documents, communicate with

tutors and classmates, submit course assignments, to critique others work" (p. 249).

4.4.7 The Findings of Hypothesis 7 (H7) Testing

The following null hypothesis was tested:

$H_0$7: There is no significant relationship between subjective norm and behavioural intention to use WBLE.

As described in chapter 3, Pearson's Correlation Coefficient (r) was used to test null hypothesis 7 ($H_0$7). Pearson's Correlation Coefficient was utilised to study the relationships between subjective norm (SN) and behavioural intention to use (BITU) WBLE. The results are presented in Tables 4.25 and 4.26.

Table 4.25: Descriptive statistics for Subjective Norm and Behavioural Intention to Use

	N	M	SD
SN	445	3.65	0.79
BITU	445	3.49	0.70

Table 4.26: Correlation results between Subjective Norm and Behavioural Intention to Use (N=445)

		SN	BITU
SN	Pearson Correlation	1.00	0.545**
	Sig. (2-tailed)		0.000
	N	445	445
BITU	Pearson Correlation	0.545**	1.00
	Sig. (2-tailed)	0.000	
	N	445	445

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

The p-value was found to be highly significant ($r = 0.545$, $p < 0.01$) (refer Tables 4.25 and 4.26). Therefore, there was strong evidence to reject the null hypothesis ($H_0 7$). Subjective norm (SN) was positively correlated with behavioural intention to use (BITU) WBLE. The results indicate that the more social influence in using WBLE, the more they are intend to use WBLE in their studies.

The findings correspond to results of studies conducted by Farahat, (2012), Grandon et al. (2005), Park (2009), Premchaiswadi and Porouhan (2012), and Punnoose (2012).

Premchaiswadi and Porouhan (2012), and Punnoose (2012) consistently found that subjective norm is an influential factor on behavioural intention to use e-learning system. Punnoose indicated that perceptions of e-learning among close associates of potential students should be increased to increase intention to study with e-learning.

Farahat (2012) indicated that "the influence of the social factors on BI could be attributed to the different effects for each category of students' referent groups ad their contribution to students' BI. For example, the higher the online instructors actualize their roles in attracting students to learn online, deploying culture of online learning, building learning community, helping students work in groups, and keeping online discussion to realize productive interaction, the more influence on students' behaviour they have" (p. 100). Farahat (2012) cites that students' intentional behaviour to use online learning

reflects, in several cases, “their families' level of support to this kind of learning; families with higher income can afford to buy hardware, software, and can afford the cost of internet access, and therefore they are likely to be supportive for online learning than do families with lower income” (p. 100).

In addition, Grandon et al. (2005) posited that subjective norm was a significant factor in predicting students’ intentions in both America and Korea. However, Grandon et al. were surprised to find that subjective norm had a stronger impact on American students as Hosftede (1997, cited in Grandon et al., 2005) emphasized that the American society is individualistic in nature which does not put much attention on social relations and interactions, yet, subjective norm was a significant factor in influencing students’ intention.

Grandon et al. further noted that since using the Internet (taking online classes) is a global phenomenon, it does not require pressure from a close circle of people or a strong social pressure to use. Students may follow the general trend and sense the global pressure instead. Additionally, the online learning environment, in general, does not promote social interactions among students, which characterized the American culture as being individualistic. On the other hand, Korean culture is described as collectivistic. Therefore, taking online classes may be considered an individualistic venture in Korea, where the co-dependency between individuals and their groups is important. Therefore, it was expected to find that subjective norm influences Korean students’ intentions in taking the online classes.

Park (2009) stated that "subjective norm may be an extrinsic motivational factor that could help the university students self-regulated their motivation on e-learning" (p. 158). Park pointed out that "subjective norm under the social influence factor pertains to behaviours that are engaged in response to recognition of other people. In Korea, people are encouraged to use IT in every field to catch up with the social change caused by IT. University students may want to adopt e-learning because they think e-learning experience will be beneficial for future job preparation. Or, they feel emotionally afraid of falling behind other students who use e-learning, if they don't take e-learning courses" (p. 158). Therefore, Park indicated that it is necessary for the university to put more emphasis on e-learning by offering a greater variety of e-learning courses and advertising the benefits of e-learning to attract students.

An additional attention should also be given to the influence of lecturer on students' intention to use e-learning. This could be perceived from Table 4.27, the mean scores for SN1 (M = 3.89), SN2 (M = 3.82) and SN3 (M = 3.72) were higher than SN4 (M = 3.18). Clearly shown that the mean score for SN4 only deviate slightly higher than the midpoint of 3, with only 33% of the respondents agreed to the statement, 48% of them remained neutral and 19% disagreed to this statement. This implies that respondents valued the influence of lecturer more than their course mate in influencing their decision whether to use WBLE or not.

Table 4.27: Descriptive statistics of Subjective Norm evaluation among respondents (N=445)

Subjective Norm (SN)						
No.	**Statement**	**Response**	**N**	**%**	**Mean**	**SD**
1.	My lecturers expect me to use WBLE.	Strongly Agree	118	27	3.89	0.92
		Agree	200	45		
		Neutral	95	21		
		Disagree	24	5		
		Strongly Disagree	8	2		
2.	My lecturers want me to use WBLE frequently.	Strongly Agree	114	26	3.82	0.96
		Agree	187	42		
		Neutral	102	23		
		Disagree	34	8		
		Strongly Disagree	8	2		
3.	My lecturers are very supportive in the use of WBLE for my course.	Strongly Agree	90	20	3.72	0.93
		Agree	188	42		
		Neutral	127	29		
		Disagree	32	7		
		Strongly Disagree	8	2		
4.	Peers/ my course mates want me to use WBLE frequently.	Strongly Agree	49	11	3.18	1.02
		Agree	98	22		
		Neutral	212	48		
		Disagree	55	12		
		Strongly Disagree	31	7		

4.4.8 Summary of Hypotheses testing

Overall, the research outcomes provide a better understanding of user's decision in the acceptance of LMS in the educational context. The findings are achieved on the basis of a proposed technology acceptance model with an additional determinant which is subjective norm.

From the above findings, it was found that UTAR students think that WBLE is useful and easy to use. In addition, they are not reluctant to learn online. Three factors were tested to study the influence towards acceptance of e-learning among these student. The results show that PU, PEOU and SN were

all found to be influential in predicting the behavioural intention to use WBLE in study.

Nonetheless, this research also examined the effects of student demographics as the external variables that may influence PU and PEOU and in turn affect the intention to use WBLE. Through the findings, it was found that gender, level of study and course of study did not differ significantly on their perception of usefulness and ease of use of WBLE.

The outcomes of the hypotheses testing indicated that in order to increase students' intention to use LMS, it is crucial to increase their PU, PEOU and SN simultaneously. More attention should be paid on the perception of usefulness regarding LMS as it is the strongest determinant of intention to use LMS.

Also, in order to enhance LMS acceptance, it is necessary to provide a variety of features to prompt users' perceived usefulness. However, it should be noted that the features should not increase the complexity of the system, as the more user friendly the user interface is, the more it is perceived to be useful. Not only does user friendliness influence the perception of usefulness of the system it also increase user's intention to use the system.

Overall, the results of hypotheses testing showed that out of the seven null hypotheses tested, six null hypotheses (i.e. $H_0$1, $H_0$2 and $H_0$4 through $H_0$7)

were successfully rejected. Table 4.28 and Figure 4.13 depict the overall findings of this research.

Table 4.28: Summary of null hypotheses testing and the decisions

Null Hypothesis	Decision
$H_0$1: UTAR students do not perceive that WBLE is useful and easy to use.	**Rejected $H_0$1** **H1 has been substantiated:** The findings indicated that UTAR students perceived that WBLE is useful and easy to use.
$H_0$2: UTAR students do not intend to use WBLE in their studies.	**Rejected $H_0$2** **H2 has been substantiated:** The findings indicated that UTAR students intend to use WBLE in their studies.
$H_0$3: UTAR student demographics such as gender, level of study and course of study do not have any significant effects on perceived usefulness (PU) and perceived ease of use (PEOU) of WBLE.	**Failed to reject $H_0$3** **Failed to support H3:** The findings indicated that UTAR student demographics such as gender, level of study and course of study do not have any significant effects on perceived usefulness (PU) and perceived ease of use (PEOU) of WBLE.
$H_0$4: There is no significant relationship between perceived ease of use and perceived usefulness of WBLE.	**Rejected $H_0$4** **H4 has been substantiated:** The findings indicated that there is a significant relationship between perceived ease of use and perceived usefulness of WBLE.

Table 4.28 (Continued)

Null Hypothesis	Decision
$H_0$5: There is no significant relationship between perceived usefulness and behavioural intention to use WBLE.	**Rejected $H_0$5** **H5 has been substantiated:** The findings indicated that there is a significant relationship between perceived usefulness and behavioural intention to use WBLE.
$H_0$6: There is no significant relationship between perceived ease of use and behavioural intention to use WBLE.	**Rejected $H_0$6** **H6 has been substantiated:** The findings indicated that there is a significant relationship between perceived ease of use and behavioural intention to use WBLE.
$H_0$7: There is no significant relationship between subjective norm and behavioural intention to use WBLE.	**Rejected $H_0$7** **H7 has been substantiated:** The findings indicated that there is a significant relationship between subjective norm and behavioural intention to use WBLE.

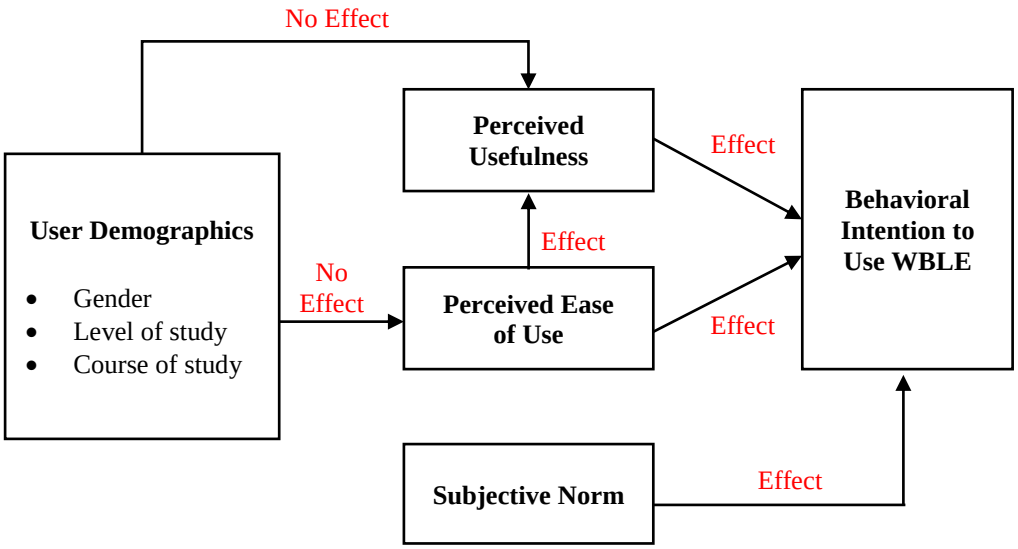

Figure 4.13: The findings of the empirically tested proposed TAM based on the research findings from testing the relevant hypotheses

4.5 Conclusion

This chapter presents all the major findings of this research obtained from the analysis of data collected through self-administered questionnaires. The findings of the data analysis include the findings of data analysis on the respondent demographics, the findings of data analysis on the actual usage of WBLE, and the findings of hypotheses testing using both descriptive and inferential statistics. In conclusion, of the seven hypotheses formulated in chapter 1, six hypotheses have been substantiated. The outcomes explained in this chapter provided inputs to the next chapter, which is the final chapter in the dissertation.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter wraps up the discussion for the research. It covers the following topics:

- Overall conclusions from the research findings
- Research contributions
- Limitations and recommendations

5.2 Overall Conclusions from the Research Findings

This research has tested a series of hypotheses to validate the research objectives formulated in chapter 1. Specifically, the following research objectives have been achieved:

i. To develop and empirically test a TAM which is built using Davis's TAM as the foundation.

ii. To investigate the extent to which UTAR students perceive that the WBLE is useful and easy to use, and their behavioural intention to use WBLE in their studies.

iii. To study the effects of UTAR student demographics such as gender, level of study and course of study on their perceived usefulness and perceived ease of use of WBLE.

iv. To examine the relationships among UTAR students' perceived usefulness, perceived ease of use, subjective norm and their behavioural intention to use WBLE.

The subsequent sections discuss the research outcomes obtained from testing the hypotheses.

5.2.1 First Objective: To Develop and Empirically Test a TAM which is Built Using Davis's TAM as the Foundation

Based on a thorough literature review on user acceptance models which is discussed in section 2.6, a technology acceptance model (see Figure 2.12) was developed based on the core-ideas of Davis's TAM. This proposed TAM was empirically tested through several relevant hypotheses to validate the research objectives that were formed at the early stage of the research. The results are depicted in Figure 4.13. Overall, it can be concluded that TAM is an appropriate theoretical model in understanding user acceptance of an LMS in the e-learning context.

5.2.2 Second Objective: To Investigate the Extent to which UTAR Students Perceive that the WBLE is Useful and Easy To Use, and Their Behavioural Intention to Use WBLE in their Studies

Second objective of this research is to investigate the extent to which UTAR students perceive that WBLE is useful and easy to use, and their behavioural intention to use WBLE in their study. This objective was achieved through the testing of two null hypotheses which are $H_0$1 and $H_0$2 respectively.

Based on the results obtained from the testing of $H_0$1 using descriptive statistics (refer sections 4.4.1.1 and 4.4.1.2), the average responses for each of the statements that measures perceived usefulness (PU) and perceived ease of use (PEOU) of WBLE are above the midpoint (3) of the 5-point Likert scale (see Tables 4.1 and 4.3). The results indicate that UTAR students have relatively positive perceptions toward the usefulness and ease of use of WBLE.

Besides, according to the results of $H_0$2 testing using descriptive statistics (see section 4.4.2), the average response for each of the statements, which measures the behavioural intention to use (BITU) WBLE are also above the midpoint (3) of the 5-point Likert scale (see Table 4.5). The results indicate that UTAR students intend to use WBLE in their studies.

Table 5.1 depicts the mean scores for PU, PEOU and BITU. From Table 5.1, it is clearly shown that average responses for all the statements that built into the PU, PEOU and BITU scales are above the mid-point (3) of the 5 point Likert-scale. Through the findings, it can be concluded that UTAR students believe that

WBLE is useful and easy to use and have intention to use WBLE in their studies. Thus, instructor could organise activities activities through WBLE and encourage student to participate in online group forum and discussion.

Table 5.1: Descriptive statistics of students' perceived usefulness (PU) and perceived ease of use (PEOU) toward WBLE and their behavioural intention to use (BITU) WBLE

Construct	M	SD
Perceived usefulness (PU)	3.45	0.73
Perceived Ease of Use (PEOU)	3.76	0.75
Behavioural Intention to use (BITU)	3.49	0.70

5.2.3 Third Objective: To Study the Effects of UTAR Student Demographics such as Gender, Level of Study and Course of Study on their Perceived Usefulness and Perceived Ease of Use of WBLE

Third objective of this research aims to examine the effects of students' demographics (i.e. gender, level of study and course of study) on their perceptions toward usefulness and ease of use of WBLE. This objective is achieved through the testing of $H_0 3$ using the independent samples t-test and one-way ANOVA test. The results are discussed in section 4.4.3.

According to the findings, students' gender, level of study and course of study did not statistically influence on the students' perceived of usefulness and ease of use of WBLE. These insignificant results postulated that:

- Computers-in-education have permeated their everyday lives and the differences between their perceptions have been narrowed till it was no longer significant.

- Many of the functionalities are not used by the students and most of them used WBLE to download course materials or check announcement only, thus they did not perceive its value differently.
- WBLE is a successful LMS tool that was perceived as useful and easy to use regardless of their gender, level of study and course of study.

Besides, these insignificant relationships also suggest that other external variables such as computer ownership, prior experience, e-learning self-efficacy, family income or so forth that may influence PU and PEOU which need further investigation. Table 5.2 depicts the overall findings obtained from the testing of user demographics as external variables that affect PU and PEOU ($H_0$3).

Table 5.2: Results of test of user demographics on perceived usefulness (PU) and perceived ease of user (PEOU)

Independent variable	Dependent variable	Significance (2-tailed)	Supported?
Gender	PU	0.936	No – No differences between groups
Gender	PEOU	0.483	No – No differences between groups
Level of study	PU	0.655	No – No differences between groups
Level of study	PEOU	0.157	No – No differences between groups
Course of study	PU	0.398	No – No differences between groups
Course of study	PEOU	0.260	No – No differences between groups

5.2.4 Fourth Objective: To Examine The Relationships Between UTAR Students' Perceived Usefulness (PU), Perceived Ease Of Use (PEOU), Subjective Norm (SN), And Their Behavioural Intention To Use (BITU) WBLE

There are four relationships studied in this research, which include PEOU—PU, PU—BITU, PEOU—BITU, and SN—BITU. Table 5.3 depicts the overall findings obtained from the testing of the relationships aforementioned for this research. Each relationship studied in this research are further elaborated in the subsequent sections.

Table 5.3: Results of tests of relationships between perceived usefulness (PU), perceived ease of user (PEOU), subjective norm (SN) and behavioural intention to use (BITU) WBLE

Independent variable	Dependent variable	Pearson Correlation (r)	Significance (2-tailed)	Supported?
PEOU	PU	0.598**	0.000	Yes – Direct effect
PU	BITU	0.626**	0.000	Yes – Direct effect
PEOU	BITU	0.597**	0.000	Yes – Direct effect
SN	BITU	0.545**	0.000	Yes – Direct effect
** Correlation is significant at the 0.01 level (2-tailed).				

5.2.4.1 Relationship between Perceived Ease of Use (PEOU) and Perceived Usefulness (PU)

A significant correlational relationship was demonstrated between PEOU and PU at a magnitude of 0.598 (refer section 4.4.4), implying that UTAR students perceived WBLE easy to use were perceived that WBLE is useful. This gives an indicator to e-learning designers to come up with an easier to operate and more user friendly e-learning application during future development. This is because the perception of ease of use among students may diminish their

perception of usefulness and in turn decline their intention to use LMS for online learning. In addition, proper training should be provided to students to ensure that they have sufficient skills and knowledge to fully utilise all the features integrated in the LMS. Once they have discovered the features it could lead them to understand the usefulness and benefits provided by the system thus would utilise it regularly to enhance their overall learning performance.

5.2.4.2 Relationship between Perceived Usefulness (PU) and Behavioural Intention to Use (BITU)

Based on the hypothesis $H_0$5 testing results presented in section 4.4.5, it was found that there was a strong significant positive correlation (r = 0.626) between perceived usefulness (PU) and behavioural intention to use (BITU). This implies that PU is a strong determinant of students' intention to use the LMS. That is, if students find that WBLE is useful, they are more likely to accept it and use it as a mode of learning.

Although UTAR students think that WBLE is useful, but the perception of WBLE is easy to use is more noticeable than they think that WBLE is useful to their study. There is a need to improve the perception of usefulness towards WBLE as PU showed a much stronger impact on intention when compared to PEOU and SN. This result exhibited that the belief in using the system will be advantageous to learning is much more important in determining intention to use the system than whether it is easy to use or perceived social pressure to perform or not to perform the behaviour.

Therefore, it is important that UTAR management make the benefits and usefulness of using e-learning very clear to students. As such perceptions would motivate the students to adopt the systems and work toward educational goals (Alatawi et al., 2014). Moreover, Alatawi et al. (2014) point out that working on efficient systems would also enhance individual user's capabilities and performance. Thus, it is essential for HEIs to put more emphasis on e-learning by offering a greater variety of e-learning courses as this would motivate the students to use e-learning more.

5.2.4.3 Relationship between Perceived Ease of Use and Behavioural Intention to Use

The testing of null hypothesis $H_0$6 (which is discussed in section 4.4.6) established a significant relationship (r = 0.597) between perceived ease of use (PEOU) and behavioural intention to use (BITU) WBLE. The results imply that if students thought that the system is easy to use and does not require a lot mental effort to use it, they have more intention to use it.

Within organisation context, Alatawi et al. (2014) stated that it is essential for the system designers and developers to design a smooth system interface for the employees. The designer of such systems should make a close consultation with the users of the system and need to work carefully while designing the system in such a way that employees may be able to explore it easily and share knowledge through the systems smoothly.

The current state of WBLE is perceived to be easy to use by the students. However, if user interface is redesigned with the consideration of students' opinion and make it more creative, it could probably increase the overall perception of the system's ease of use. Meanwhile, it will also boost up the perception of usefulness toward the system and lead to higher intention to adopt the system.

5.2.4.4 Relationship between Subjective Norm and Behavioural Intention to Use

Based on hypothesis $H_0$7 test results as discussed in section 4.4.7, subject norm (SN) was significantly correlated with behavioural intention to use WBLE. The findings suggest that students who believe that lecturer or course-mates think that they should use or should not use WBLE will directly influence their intention to use WBLE.

Notably, students valued lecturer's influences more than the course-mate's influences. The results show that lecturers play an important role in affecting students' perception on the e-learning system and whether to accept it or reject its usage. Some students who participated in the survey emphasised that some of the lecturers did not use WBLE.

Therefore, it is vital that lecturers hold a positive attitude towards the use of WBLE and frequently engage students in online learning such as forum discussion. Besides, university management should also provide appropriate training for the instructors to ensure that they have adequate skills and knowledge

to use WBLE. Also, institution should constantly advertise the benefits of e-learning to motivate the instructors and students to use the system.

5.3 Research Contributions

The research outcomes would have significant implications to system implementation in the real world. It is beneficial for a HEI in the way that the presented findings pertaining to factors influencing students' intention to use course management systems could be used as a reference when evaluating and enhancing the existing system.

Besides, it could also be used as a guideline for system designers or developers when developing better system in the future, at the same time, aid in predicting how users' responses to the new implemented system. Thus, implementing a more effective system via corrective measures and techniques could be deployed to foster a more efficient learning environment and lead to system success in the long run.

Lastly, this research will make valuable academic contributions to the technology acceptance literature for LMS in Malaysia and serve as a future reference for researches on the subject of technology acceptance.

5.4 Limitations and Recommendations

This research has some limitations that need to be enhanced in future research. Firstly, this research did not include another group of LMS users, which are lecturers. Since social pressure from lecturer's perspective also directly influence students' intention to use LMS, thus additional research is needed to examine lecturers' perception of LMS and also factor that influence their adoption of the technology.

Secondly, the findings of this research have limitations in terms of generalizability to the whole Malaysia because the data were only collected from a single private higher education provider. Students from different universities may behave differently thus may have different outcomes. Future research might be conducted to investigate the acceptance of LMS from students of different universities within Malaysia, which include both public and private institutions.

Thirdly, as this research focused only on education sector, external generalizability of the research results to other populations may be limited. Additional research needs to be done in order to generalize the research findings using subjects from other domains and sectors. For example, the findings of this research may be replicated in an actual organisational context.

Lastly, there are numerous factors that may affect acceptance of LMS, however, this research focused only on three factors as seen in the proposed model. Further research could adopt a more complex research model by including

different potential determinants such as perceived enjoyment, perceived information quality, perceived website quality, perceived playfulness and etc.

5.5 Conclusion

Davis (1993) claimed that "Lack of user acceptance has long been an impediment to the success of new information systems" (p. 475). While LMS is adopted to facilitate learning, user acceptance must be considered during the development in order to enhance its successful adoption. This research represents research in examining the applicability of TAM to explain students' acceptance of LMS within the academic setting. A research model that extends the TAM to include subjective norm constructs as main determinant was proposed. A self-administered questionnaire was used to elicit responses from 445 full time foundation studies and undergraduate students in UTAR.

Overall, findings from this research suggest that:

- The proposed TAM (depicted in Figure 2.12) is an appropriate model to explain and predict students' acceptance of LMS in the university context. The model provides a conceptual depiction of what motivates student to use LMS with reasonably strong empirical support.
- UTAR students think that WBLE is useful and easy to use.
- UTAR students have intention to use WBLE for learning.

- Student demographics such as gender, level of study and course of study are not the factors that will affect their perception either usefulness or ease of use towards WBLE.
- Data analysis yielded results supporting the idea that perceived usefulness was a main determinant of one's intention to adopt a technology while perceived ease of use and subjective norm also found to have a significant effect on influencing one's intention to use the technology but to a lesser magnitude. The results indicate that the ability of LMS to improve students' study performance and enhance their effectiveness on coursework and learning is more important that it is easy to use and perceive social pressure to use the system.

Therefore, it is imperative for the institution to emphasize on the usability of LMS by offering a greater variety of e-learning courses. Also, LMS designer have to take user experience into account during development. Not only must the system be able to improve students' performance and advantageous to their study, it must be user-friendly which required minimal mental to be skilful at using the system. The ease of use and usefulness of a LMS can add value to the existing system through improving and enhancing students' acceptance toward e-learning.

Besides, instructors must be provided with sufficient training to be familiar with the technology, and exhibit a strong acceptance behaviour towards the technology. Instructors should promote the use of LMS by complementing LMS with traditional teaching and learning process. Meanwhile, the university

management should advertise the benefit of LMS to enhance students' perception towards e-learning.

In conclusion, HEIs should develop strategic plans and provide guidelines considering students' acceptance in order to include all critical success factors for the sustainable deployment of e-learning. The results of this study could provide insight into what factors need to be considered for designing an e-learning system and the guideline to enhance existing LMS or future IT implementation.

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Appendix A

Survey Questionnaire

UNIVERSITI TUNKU ABDUL RAHMAN

Department of Internet Engineering and Computer Science
Faculty of Engineering and Science
University Tunku Abdul Rahman
Jalan Genting Kelang, 53300 Setapak
Kuala Lumpur, Malaysia

Dear Participant,

I am a postgraduate student from Faculty of Engineering and Science, Universiti Tunku Abdul Rahman (UTAR), Malaysia. I would like to invite you to be a part of a research study by completing the attached survey. This research entitled: An empirical investigation of university students' acceptance towards a Learning Management System based on a Technology Acceptance Model. The aim of the research is to develop a Technology Acceptance Model that can demonstrate acceptance and actual behaviour of WBLE (Web-Based Learning Environment) usage by undergraduate students at UTAR. The purposes of this questionnaire are to investigate your perception toward WBLE, and to determine factors that affect your perception and usage of WBLE.

This research will require that you complete a questionnaire survey below (5 pages). It takes approximately 20-min to complete. Your name and any of the information you provide will be kept strictly confidential and will not be attributed to the individual or organisation. All responses will be stored in a secure environment. The results of this research would be used for academic purposes only. In order for the results of this survey to truly represent your thinking, **it is important that you fully complete the enclosed questionnaire**. Your response to this survey is very important to us in providing valuable information for the research.

Please answer all questions as honestly as possible and return the completed questionnaires promptly to your lecturer who is conducting the survey. Your help would be greatly appreciated. Thank you very much for your time and cooperation.

Yours sincerely,

Alison Ooi

Alison Ooi Sze Hwei
Email: hweihwei88@hotmail.com

To what extent you agree with each statement in Sections A and B? Please tick [✓] the most appropriate option in the relevant column for each statement below.

Ratings:

1 = Strongly Disagree
2 = Disagree
3 = Neutral (Neither Agree nor Disagree)
4 = Agree
5 = Strongly Agree

Section A: Perceived Usefulness and Perceived Ease of Use toward WBLE

A1: Perceived Usefulness						
No.	**Statement**	**1**	**2**	**3**	**4**	**5**
1.	Using WBLE increases my productivity/ helps me to be a productive student.					
2.	Using WBLE enhances the effectiveness on the course coursework and my learning.					
3.	Using WBLE makes me easier to do the course coursework.					
4.	Using WBLE improves my study performance in this course.					
5.	WBLE makes me easier to learn in university.					
6.	WBLE gives me greater control over learning.					
7.	I find WBLE a useful tool for my learning in this course.					
8.	Overall, I find WBLE to be advantageous to my learning in this course.					

A2: Perceived Ease of Use						
No.	**Statement**	**1**	**2**	**3**	**4**	**5**
1.	Learning to operate WBLE is easy for me.					
2.	I would find it easy to get WBLE to do what I want it to do.					
3.	My interaction with WBLE is clear and understandable.					
4.	It would be easy for me to become skilful at using WBLE.					
5.	My interaction with WBLE does not require a lot of mental effort.					
6.	Overall, I find WBLE easy to use.					

Section B: Social Influence and Behavioural Intention to Use the WBLE

B1: Subject Norm (Social Influence in using WBLE)						
No.	**Statement**	**1**	**2**	**3**	**4**	**5**
1.	My lecturers expect me to use WBLE.					
2.	My lecturers want me to use WBLE frequently.					
3.	My lecturers are very supportive in the use of WBLE for my course.					
4.	Peers/ my course mates want me to use WBLE frequently.					

B2: Behavioural Intention to use WBLE in the future						
No.	**Statement**	**1**	**2**	**3**	**4**	**5**
1.	Assuming I have access to WBLE, I intend to use it.					
2.	Given that I have access to WBLE, I plan to use it as much as possible.					
3.	To the extent possible, I would use WBLE to do different things, from downloading course materials (e.g. lecture notes, etc.) and participating learning activities on the WBLE.					
4.	I intend to increase my use of WBLE in the future.					
5.	Overall, I have a positive perception towards using WBLE.					

Section C: Actual Usage of WBLE

1. **On the average, I login to WBLE:** (Please tick [✓] only **ONE** option)

❑ Several times each day
❑ Once a day
❑ Several times each week
❑ Once a week
❑ Once in a fortnight
❑ Once a month
❑ Once a trimester
❑ None at all

2. **On the average, the length of time I spent every time I login to WBLE:** (Please tick [✓] only **ONE** option).

❑ More than 60 minutes
❑ Between 46 and 60 minutes
❑ Between 31 and 45 minutes
❑ Between 15 and 30 minutes
❑ Less than 15 minutes

3. **Indicate your purposes of accessing to WBLE:** (Please tick [✓] **all** that apply)

   ❑ Download course materials (e.g. lecture notes, etc.)
   ❑ Chat with lecturers and course mates
   ❑ Participate in online forum discussion
   ❑ Check upcoming events
   ❑ Check announcement
   ❑ Others (Please list):
   _____

4. **On the average, how often do you use the following features available in WBLE?** (Please tick [✓] only **ONE** option per row)

Features	**Never use**	**At least once a day**	**At least once a week**	**At least once a month**
Course Resources				
Announcements				
Grades List				
Personal Profile & Blog				
Chat				
Forum				
Calendar				
Others (Please list):				

5. **Rate the level of usefulness of the following features in WBLE:** (Please tick [✓] only **ONE** option per row)

Features	**Not useful**	**Somewhat useful**	**Useful**	**Very Useful**
Course Resources				
Announcements				
Grades List				
Personal Profile & Blog				
Chat				
Forum				
Calendar				
Others (Please list):				

6. Which of the following applications that you are using as alternatives to WBLE for the purpose of learning? (Please tick [✓] **all** that apply)

   ❑ Photo sharing (e.g. Flickr)
   ❑ Video sharing (e.g. YouTube)
   ❑ Blogging tools (e.g. Wordpress, Blogspot/Blogger)
   ❑ Presentation hosting service (E.g. Slideshare)
   ❑ Communication tools (e.g. Skype)
   ❑ File storage service (e.g. Google Drive, Google Docs, Dropbox)
   ❑ Facebook
   ❑ Twitter
   ❑ Other social networks (e.g. MySpace, Google Plus, and others)
   ❑ Others (Please list): _____

7. Any other comments on the WBLE usage:

   _____
   _____
   _____
   _____
   _____
   _____

Section D: Personal Details

Please tick [✓] only **ONE** option for the following questions:

1. **Gender:** ❑ Male ❑ Female

2. **Current LEVEL and YEAR OF STUDY:**

   ❑ Foundation Studies: [Kindly proceed to **question 3 (a)**]
   Year: **1 2 3**

   ❑ Undergraduate: **[**Kindly proceed to **question 3 (b)**]
   Year: **1 2 3 4**

3 (a). Current Foundation programme:

- ❑ Foundation in Arts
- ❑ Foundation in Science

3 (b). Current Undergraduate Programme / Course of Study: (e.g. Graphic Design and Multimedia / Broadcasting / Media & Creative Studies / Actuarial Science / Computer Science, etc.)

Please specify: _____

4. How would you rate your computer skills (Computer literacy)?

Very Poor	Poor	Fair	Good	Very Good
❑	❑	❑	❑	❑

5. How would you rate your Internet or Web skills?

Very Poor	Poor	Fair	Good	Very Good
❑	❑	❑	❑	❑

THANK YOU FOR YOUR TIME AND COOPERATION