UNIVERSITY OF KWAZULU-NATAL

**STAFF PERCEPTIONS AND USE OF BLACKBOARD AT
DURBAN UNIVERSITY OF TECHNOLOGY**

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DECLARATION

I, Devraj Moonsamy, declare that

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(ii)   This thesis has not been submitted for any degree or examination at any other university.

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ABSTRACT

Students of today up to the age of 25 are referred to as digital natives. They have grown up in a world of computers and the Internet. They live in a so called anytime/anyplace world, that is not constrained by time or place. Most educational institutions, on the other hand, operate on fixed campuses and within fixed calendars preferring more passive means of instruction like lectures and the use of textbooks. Digital natives, however, are more active learners preferring, interactive learning which includes the use of the Internet and associated applications.

There is clearly a mismatch between what higher education institutions are offering and what digital natives are expecting. Evidently higher educational institutions need to change in order to keep abreast with the technologically savvy students they serve.

Many higher educational institutions have realized the benefits of online learning and are therefore investing in online learning technologies to meet this change. This includes the Durban University of Technology which is investing huge sums of money in the learning management system (LMS) Blackboard, intended to facilitate teaching and learning at the University.

This study investigates the perceptions of staff towards the use of Blackboard for teaching and learning to understand the reasons for the slow adoption of Blackboard by staff.

Both qualitative and quantitative methods were used in this study. The quantitative technique involved the statistical and numerical analysis of the responses to the closed-ended Likert type questions. The qualitative method involved using the data obtained from the interviews.

The study has revealed that academic staff (users and non-users of Blackboard) and students are in agreement that Blackboard will enable them to improve their teaching and learning, however staff as well as students, have indicated that some of the

facilitating conditions need to be addressed for them to fully adopt the use of Blackboard.

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CHAPTER 1 : INTRODUCTION TO THE STUDY

1.1. Introduction

The students that we face almost on a daily basis in lectures are referred to as digital natives, provided that they are not older than 25 years. They have been brought up in a world surrounded by computers and the Internet living in an "anytime/anyplace world, that is not constrained by time or place" (Levine, 2010, p. 5). Many residential educational institutions on the other hand, operate from fixed campuses and within fixed schedules with a typical lecture period being approximately 50 minutes (Levine, 2010).

Institutions of higher learning have traditionally preferred face to face classes and the use of textbooks. Digital natives, however, being more active students, tend to be more inclined to interactive learning which involves the use of group discussions, case studies, field studies, and simulations. Generally higher educational institutions tend to use the traditional medium of print, while students have a preference for the new media which includes the various web applications that use the Internet as a platform (Levine, 2010). There is clearly a mismatch between how teaching takes place in most higher education institutions and what the digital natives expect the learning process to be. While the institutions are focusing on the process of educating, digital natives are more concerned with the outcomes of education (Levine, 2010). Clearly staff at higher educational institutions, need to change in order to keep abreast with the technologically savvy students they serve. Many higher educational institutions are investing in online learning technologies to meet this expectation. They have realised the benefits of online learning. According to Appana (2008) some of the main benefits of online learning include:

- Being able to expand the course offerings to a wider group of students and thus not being confined to only students that live in the vicinity of the institution.
- Being able to offer an online course to a larger group of students who do not have to attend classes, means that there is a minimal cost that is incurred by

the institution for physical space and other related expenses and this means that the institution will obtain a higher income.

- The ability of online courses to overcome location and time boundaries implies that institutions can partner with other organisations internationally.

- Online courses can easily be available to a larger group of students and thus institutions need not spend an inordinate amount of time marketing these courses.

- There are many educational benefits to online learning that can accelerate the learning process.

- A student taking an online course can choose to be anonymous and this will encourage him/her to engage in discussions with the lecturer and other students.

- Online learning easily allows for students to interact with staff as well as their lecturers, tools such as discussion boards, chat facilities and email help to facilitate this interaction.

- Students are much more open to providing feedback on both the subject as well as the lecturer due to being able to remain anonymous.

1.2. Background of the study

At a time when almost all universities are moving towards e-learning and making extensive use of information and communications technology (ICT) in teaching and learning, the Durban University of Technology seems to be lagging behind. With huge student enrolments and associated large classes, access to education is still problematic for many students, despite the university's investment in a Learning Management System (LMS) such as Blackboard. Many students do not have access to computers and the internet at home, but these are available on campus. Recently, more and more students are acquiring smart phones that are connected to the internet.

In the last decade, the trend in education has been a move towards online instruction and "blended" instruction which replaces components of face-to-face instruction. Graham (2006) considers blended learning to be the combination of online and face-

to-face learning. An example of blended instruction is the use of a learning management system to facilitate teaching and learning (Martin, 2008).

In the period 1995 to 2000 a significant transition in e-learning was the incorporation of Learning Management Systems (LMSs). Among the popular examples of learning management systems are Blackboard, Moodle, and WebCT which are designed to facilitate web based learning (Missula, 2008). A learning management system (LMS) is a web enabled software platform designed to ensure the proper management and delivery of learning materials to students (Martin, 2008). Communication tools that an LMS provides enable the easy interaction between lecturer and student and among students. Various assessment tools enables students to be assessed by ensuring that students obtain an instantaneous feedback on some assessments like the online quizzes (Martin, 2008). Martin (2008) adds that the majority of the learning management systems use the internet as its platform so as to enable students to access the resources anywhere and even at any-time thus overcoming location and time boundaries, however, one can also access learning resources "anytime, anywhere" with the Internet. Thus an LMS offers much more than simply facilitating access to resources, it enables interactive learning anytime and wherever the student chooses.

Learning management systems are at the forefront of e-learning initiatives in many Higher Education institutions (Heirdsfield, 2011). The LMS Blackboard, has been used at the Durban University of Technology for approximately 13 years.

According to Arbaugh and Duray (2002), a learning management system can be used in many ways to facilitate teaching and learning. This includes:

- Completely replacing face-to-face (F2F) teaching in a classroom with a virtual online classroom.
- Using a combination of both F2F teaching as well as online teaching ("blended approach").
- Supplementing an existing F2F class by means of the LMS.

According to Breen, Cohen and Chang (2003) the LMS can greatly facilitate learning by enabling easy access to learning resources, by providing almost instantaneous feedback to students through on-line assessment and by improved communication that can take place between student and lecturer through discussion forums and email (Beard and Harper, 2002). This method of education is in keeping with the theory of social constructivism advocated by Vygotsky(1978, p.24), which states that "education should be cultivated, generated and improved with the help of interaction with groups of learners, but cannot be imparted forcefully". LMS's encourage discussions and social learning if managed appropriately by the lecturer.

Appana (2008) lists many advantages of using online learning including amongst others:

- Enabling access to the course to an increased number of students.
- An improved quality of learning.
- Better preparing students for "lifelong" learning opportunities.
- Making courses more profitable.

Despite the reasons suggested by Appana (2008) as to why education providers should be open to the adoption of e-learning, there is still reluctance by staff at DUT to use e-learning tools such as Blackboard.

1.3. Problem Statement

The problem is succintly captured in the statement by Pratt (2003, p. 1) "The degree to which people are facing revolutionary technological changes in the near future is matched only by the degree of inertia evinced by educational institutions". This statement is certainly true of most staff at the Durban University of Technology (DUT). The use of Blackboard has been in place at DUT for a considerable period of time. Despite the availability of the LMS many staff have not used the LMS.

With such a huge investment in time and money on the use of the Blackboard LMS, it is important to understand how and to what extent these technologies are being used, and to determine the perceptions of staff in the use of Blackboard.

1.4. Research Objectives

The university under study has licensed the use of Blackboard with the intention of facilitating teaching and learning, in the hope of addressing the low pass rates of students at the institution.

To this end, this study aims to investigate the perceptions of staff towards the use of Blackboard for teaching and learning to understand the reasons for the slow adoption of Blackboard by staff. A related aspect of staff perceptions is students' perceptions – which are deemed necessary in the overall rate of adoption.

Hence, the objectives of the research are:

- To understand how performance expectancy and effort expectancy influence staff in using Blackboard.
- To determine the social influences that instigate the adoption of Blackboard.
- To determine the facilitating conditions that influence the use of Blackboard.
- To determine to what extent the constructs contribute separately and together to the adoption of Blackboard.

In order to achieve the objectives, the research is guided by the following questions:

- How does performance expectancy (PE) influence staff in using Blackboard?
- How does effort expectancy (EE) influence staff in using Blackboard?
- What are the social influences (SI) that instigate the adoption of Blackboard?
- What are the facilitating conditions (FC) that influence the use of Blackboard?
- To what extent do each of the constructs and the constructs as a whole affect the adoption of Blackboard?

A mixed methods approach was used to conduct the study with the chief method of data collection being a self-administered questionnaire. First qualitative data was obtained by conducting in-depth interviews with selected academic staff members, followed by the self-administered questionnaire.

The study is underpinned by the unified theory and use of technology (UTAUT) model developed by Venkatesh, Morris, Davis and Davis (2003).

1.5. Rationale for the Study

The Durban University of Technology has invested and continues to do so in making the LMS, Blackboard, available in the institution. However, in spite of this effort and investment by management, anecdotal evidence suggests that staff may not be using the LMS to its full potential. Furthermore it is the intention of DUT to have 50% of all courses offered online (that is on Blackboard) by 2015.

1.5.1. Significance of the Study

Research findings of this study will help identify factors that may be preventing staff from adopting the use of Blackboard as well as factors that encourage the use of the LMS by staff. The findings will in turn contribute to the development of support programmes to assist staff overcome barriers in using Blackboard resulting in the attainment of the vision of DUT's e-learning investment.

1.6. Delimitations of the Study

- The research was conducted using subjects only from the Durban University of Technology. Hence the research findings may not necessarily apply to other institutions.
- Only academic staff members and students were included in the study therefore the findings cannot be applied to non-academic staff in other departments at the institution.

The next section presents the outline and organisation of the study.

1.7. Outline of the Study

The study consists of five chapters.
Chapter 1 describes the background to the study, the research objectives, and methodology, rationale of the study and the delimitations of the study.

Chapter 2 presents the literature review that supports the study for a motivation as to why this investigation is important.

Chapter 3 expounds the theoretical framework on which the study is based.

Chapter 4 describes the research methodology used in the study explaining the sampling methods, the measurement instrument and the various statistical and qualitative methods selected to analyse the research results.

Chapter 5 provides the results of the research. An analysis of the results is reported.

Finally chapter 6 summarises the findings, and implications for practice and implementation are considered. Some recommendations are made for further study.

This chapter contextualises the entire study by focussing on the problem of staff adoption of Blackboard at DUT, research objectives and methodology, rationale for the study and limitations of the study. The next chapter reviews various literature related to the objectives of the study.

CHAPTER 2 : LITERATURE REVIEW

2.1. Introduction

To obtain a more detailed understanding of the field of study, various areas of related literature are reviewed. Based on the main objectives of the study which is the identification of the factors affecting staff adoption of the learning management system Blackboard at the Durban University of Technology, the literature on e-learning or online learning is presented first together with the affordances and limitations of online learning.

To overcome the limitations of exclusive online learning the literature on blended learning is reviewed. Blended learning is implemented at many institutions by means of a Learning Management System and thus the understanding of the adoption of LMSs by both staff and students becomes important. Factors that enhance the adoption of LMSs as well as factors that inhibit the adoption of LMSs are considered.

Staff and students perceptions towards the use of LMSs' are also reviewed to obtain a clear understanding of staff adoption of an LMS.

Finally, other similar studies as well as studies at DUT are reviewed so as to place the current study into context.

2.2. E-Learning or Online learning

E-learning or electronic learning is also commonly referred to as online learning (Shelly, Gunter & Gunter, 2011). The definition of the term E-learning is not globally consistent. In most cases it refers to web based and distance education that may also incorporate traditional classroom teaching. It includes the various forms of learning where digital technology is used to facilitate the teaching and learning processes (Kumar, 2010).

Shelly, Gunter and Gunter (2011) add that online learning utilises a local network or the internet for the delivery of learning content and to facilitate the interaction between students and the lecturer. There are a number of advantages and limitations that have been cited in the literature; some are highlighted below.

Advantages of Online Learning

According to Shelly *et al*., (2011), a complete online course is one that is taught only via the Internet unlike in a traditional classroom. There are several advantages to having a course completely online and these include:

- Meeting specific needs of students for example, disabled students.
- Online courses are designed to greatly enhance the teaching and learning of weaker or at-risk students.
- The institution may not have the resources to offer the course in the traditional way and offering it online becomes more cost effective as a greater number of students can be enrolled for the course.
- Meeting the needs of employed students who may not have the time to attend lectures.

In an earlier study, Kumar (2010) identified the following advantages of online learning:

- Improved performance of students who pursue online learning as compared to traditional classes.
- Increased access: Instructors can share their knowledge irrespective of their location, and students can take online courses overcoming physical, economic and political boundaries.
- Expediency and flexibility to learners: Online learning is usually self-paced and the online classrooms are available 24/7. This means that the students are not constrained by time or place, thus meeting a crucial need of digital natives.

Limitations of Online Learning

Despite the popularity of online learning globally, Nielsen (2013) cites some limitations namely:

- The dropout rate of online learners is much higher than learners attending a traditional class. This is attributed to inadequate support and inherent problems in online learning.

- Online learners feeling isolated and overwhelmed in pursuing online courses.

- Online teaching does not adequately develop problem solving skills, student interaction, oral presentations and verbal skills as does class room teaching.

- Lack of interaction between instructors and students i.e. instructors who never meet their students.

2.2.1. Blended Learning

Many institutions are using blended learning to overcome some of the limitations of exclusive online learning. Blended learning incorporates both online learning as well as traditional classroom learning. Courses that are taught using the blended approach, draw on the benefits of both online learning and traditional face to face classes. As a result a richer learning environment is created than either an online or a traditional class can achieve alone (Harding, Kaczynski, & Wood, 2012).

Blended learning in many institutions is facilitated by the use of a learning management system that not only serves as a repository for online resources, but adds a virtual dimension to traditional campus based studies (Heirdsfield, 2011).

2.2.2. Learning Management Systems

In the past the creation of an online learning environment meant that the instructor would have to create a web site and have an in depth understanding of various web technologies and programming skills. However, with the advent of a learning management system this skill is no longer required and makes the task of creating online learning environments simpler.

As mentioned earlier a learning management system is a web based software environment created for the management and delivery of courses online. It provides opportunities for interaction among students and between the lecturer and students. It thus facilitates "anytime, anywhere" access to learning resources. Blackboard is one example of a LMS that is commonly used in higher education institutions (Martin, 2008). The university under study has chosen to use the Blackboard learning management system for all students.

Coates (2005) maintains that learning management systems combine course and pedagogical tools to enable the creation of online learning environments. He further details the common tools that LMSs include:

- Asynchronous and synchronous communication tools (email, announcement, chat, instant messaging and discussion forums).
- Tools for the delivery and creation of online resources (course documents, digital drop box, virtual classroom, podcasting).
- Assessment tools (online quizzes, multiple choice testing, collaborative work).
- Class and user management (registering students, tracking student activities).

Learning management systems have impacted education to such an extent that the gap between distance education and campus based education has narrowed significantly. In the past distance education students felt isolated and alone in pursuing their studies but this has changed with the advent of the LMS which provides many tools as well as a virtual classroom that students can explore and thus be in contact with the lecturer as well as other students (Heirdsfield, 2011).

2.3. Adoption of Learning Management Systems

Many universities worldwide have adopted the use of a learning management system as a means of implementing online or blended learning. However this adoption is at the organisational level, which does not necessarily mean that majority of the staff

have adopted the use of this technology. Coates (2005) argues that there are many drivers for the adoption of learning management systems, some of which are listed:

- Learning management systems can increase the efficiency of teaching.
- They enable enriched student learning.
- They fulfil new expectations of students, that is, an expectation for the use of advanced technology.
- Competitive pressure between institutions to attract the best students.
- A greater demand for entry into higher education by students.
- They facilitate the monitoring and regulation of teaching.

However, despite these drivers for the hastened adoption of LMSs the true educational value of LMSs is determined by their uptake and use by staff members.

Al-Busaidi and Al-Shihi (2010) add that the success of a learning management system at any institution first starts with the acceptance of this technology by instructors and this in turn will promote students' use of the LMS in class. In a very recent study on LMSs among academic staff, Govender and Govender (2014) affirmed that the successful implementation and adoption of an LMS begins with the academic staff embracing the use of the LMS first.

2.4. Staff perceptions of LMS

It is important to understand the perceptions and attitudes that individuals have towards technology since this will influence whether and how they will use the technology. A thorough understanding of individuals' attitudes towards learning technology will thus enable the creation of an engaging and effective learning environment (Liaw, Huang & Chen, 2007). Liaw *et al*. (2007) add that despite the advancement of the technology, its effective implementation will depend on users having a positive attitude towards it.

According to research done by Waycott, Bennett, Kennedy, Dalgarno and Gray (2010), staff at higher education institutions felt that there are a number of benefits in using technology in teaching, namely:

- Better communication,

- Efficiency in facilitation of lectures,

- Immediacy of access to information,

- Convenient access to resources,

- Sustained students' engagement.

However, despite the many benefits highlighted, Waycott *et al.* in their study also reveal a number of limitations in using ICT in higher education:

- An increase in staff workload,

- Usability / technical issues,

- The loss of face – face interaction,

- Students unprofessional use of communication tools,

- Institutions preference given to technology rather than pedagogy.

Additionally, staff felt that the use of technology in their classes not only increased their workload, but also gave students the impression that they are always available to answer questions. Other limitations were concerned with usability and technical issues which include the difficulty in navigation when using certain tools of the educational program. Similarly, problems with the user interface were as a result of the software and technical break-downs (Waycott *et al.*, 2010). Interestingly, Waycott *et al.* (2010) found that staff were concerned about losing face-to-face interaction with their students when using technologies in communicating with them, yet the key benefit of using the technology is the range of communication tools available to facilitate communication among students and lecturers. In spite of this benefit, Waycott *et al.* (2010) observed that students did not only make less use of these tools, but made inappropriate comments on the discussion forums – totally unrelated to the subject at hand. Waycott *et al.* (2010) further emphasized that the decision to implement technology at institutions is driven by the competitive pressure among institutions in the use of technology rather than the inherent pedagogy that can be harnessed.

2.5. Student perceptions of a LMS

Notwithstanding the many benefits afforded by a learning management system, research indicates that many learners who start an online course do not complete it (Dutton and Perry, 2002). Thus it is important to understand the perceptions and attitudes that students have towards e-learning and learning management systems as this will assist in the development of appropriate online teaching environments.

According to Bouhnik and Marcus (2006) students are generally unhappy with e-learning for the following reasons:

- The absence of a firm framework discourages students from learning.
- Students are required to be highly self - disciplined.
- E-learning systems lack a learning atmosphere.
- E-learning systems minimise student contact and discussion among students.
- Students are required to spend more time learning the subject matter.
- There is an absence of interpersonal interaction with the lecturer and other students.

Bouhnik and Marcus (2006), however, maintain that students' dissatisfaction can be overcome by careful design of the learning environment. For instance, if the learning environment has a discussion forum then this can be used to facilitate engagement with the content among students – in this way more engagement with students occurs and social learning can take place.

Sun, Tsai, Finger, Chen and Yeh (2008) identified a number of factors that influence students' satisfaction with e-learning. They grouped these factors into six dimensions: learner, instructor, course, technology, system design and environmental dimension. Figure 2-1 represents the dimensions together with the factors.
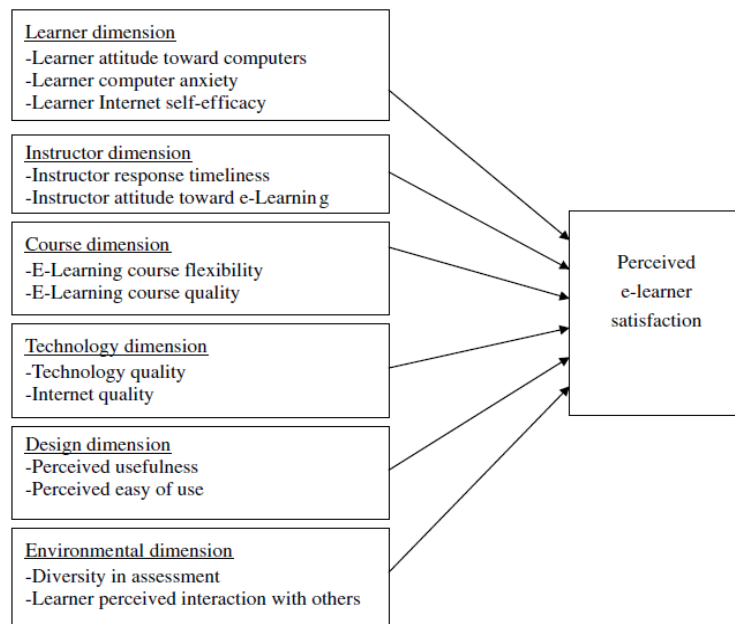
Figure 2-1: Dimensions and Antecedents of perceived e-learner satisfaction(Sun *et al*, 2008)

Learner Dimension

Sun's *et al.* (2008) study on learner satisfaction found that learner attitude and computer efficacy or computer skills, does not affect the users' satisfaction. As their study was carried out in Taiwan, where the level of computer literacy is high and computers are regarded as a necessary tool, computer anxiety was found to negatively affect learner satisfaction in an e-learning environment.

Instructor Dimension

The attitude that an instructor has towards e-learning affects students' satisfaction. For example, an instructor who has a negative perception of e-learning will naturally not have students who are highly satisfied and motivated (Sun, Tsai, Finger, Chen, & Yeh, 2008).

Course Dimension

The quality and adaptability of an online course will affect students' satisfaction. Additionally students' perceptions of the usefulness, and ease of use of e-learning

and the varied forms of testing are factors that will affect students' satisfaction with e-learning.

Technology Dimension

Technology and Internet quality, however, did not have a huge influence on e-Learner satisfaction in this study since the ICT that were incorporated into e-learning in Taiwan were fairly mature, however, this may not be the case at DUT.

Design Dimension

The usefulness and ease of use of e-learning by learners was found to influence e-learner satisfaction positively, i.e. the higher the perceived usefulness the more satisfied the learner.

Environment Dimension

Different assessment methods enable the lecturer to determine the learning effects from different dimensions so that online instruction can be easily facilitated. Furthermore, the various forms of assessments motivate students to perform well in the differing evaluation schemes. Thus, higher learner satisfaction occurs (Sun, Tsai, Finger, Chen, & Yeh, 2008).

2.6. Factors that encourages the adoption of an LMS

The success of a learning management system first starts with the acceptance of the LMS by the lecturer prior to it being accepted and utilised by the learners (Al-Busaidi & Al-Shihi, 2010).

In developing a theoretical framework for the evaluation of lecturers' adoption of a learning management system, Al-Busaidi and Al-Shihi (2010) considered the many factors that affect lecturers' perception of ease of use and usefulness of the LMS. These factors are grouped into three categories, the instructor, organisation and technology as shown in figure 2-2.
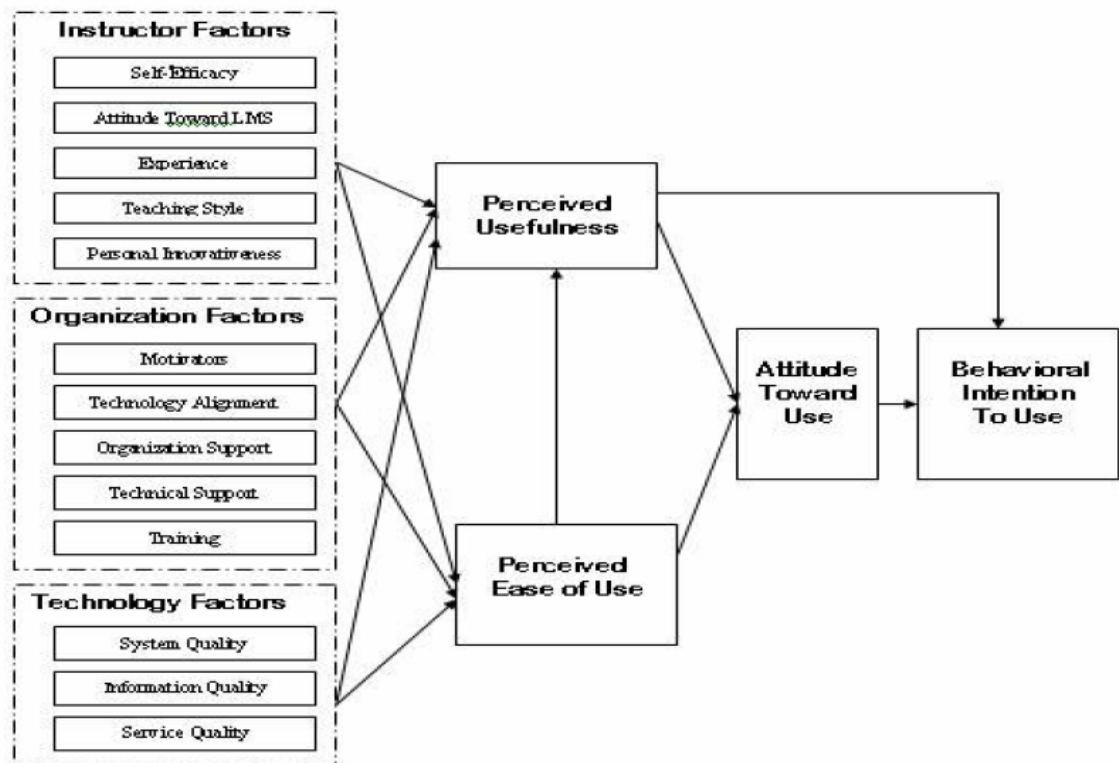
Figure 2-2: Instructor's LMS acceptance model   **Source: (Al-Busaidi, 2010)**

Instructor Factors

Self-efficacy is regarded as a critical factor when it concerns the acceptance of information systems, as well as learning management systems.

The attitude of the instructor is an important determinant of acceptance of an LMS. Furthermore a positive attitude of instructors will influence e-learning positively and can even encourage learners to adopt e-learning (Al-Busaidi & Al-Shihi, 2010). An earlier study by Nanayakkara (2007) revealed that the influence of colleagues has a positive effect on instructors' adoption of a LMS. According to Venkatesh & Davis (2000) experience in the use of technology is also important, contributing to the acceptance of technology. Thus the more experienced an instructor is in the use of technology, the more likely he / she will accept the new technology.

Personal innovativeness concerning the use of information technology is defined by Al-Busaidi and Al-Shihi (2010, p. 5) as:

" a person's attitude reflecting his tendency to experiment with and to adopt new information technologies independently of the communicated experience of others".

Several studies have indicated the importance of personal innovativeness on technology acceptance including studies by Van Raaij and Schepers (2008) and Schillewaert *et al.* (2005).

Organisation Factors

There are many factors within an organisation that help in motivating instructors to adopt and integrate technology in teaching and learning. It would be in the interest of all stakeholders to have some form of reward or recognition put in place so that integrating technology in teaching and learning may be encouraged among academic staff. There is no doubt that much effort will be required initially to align one's curriculum or teaching with the LMS (Al-Busaidi & Al-Shihi, 2010).

Technology alignment in an e-learning context concerns the alignment of electronic learning with the outcomes of the course. This can lead to the acceptance of technology by instructors. Hence organisational support including support from senior managers will encourage the acceptance of technology by instructors. More specifically, technical support for instructors is essential as well as to ensure the acceptance of technology by staff (Al-Busaidi & Al-Shihi, 2010).

Training which includes workshops, courses and seminars will affect the acceptance of technology by instructors (Al-Busaidi & Al-Shihi, 2010). However, according to Nanayakkara (2007), staff release time for development and learning the technology is another factor that will contribute to staff adoption of e-learning.

Technology Factors

Technology factors refer to information quality, service quality and system quality, where system quality signifies characteristics of the system such as reliability,

accessibility, functionality, interactivity and response. These characteristics of a system were found to affect e-learning adoption.

Information quality is related to the quality of output of the system. With regard to e-learning information quality embodies the characteristics of information such as relevance, timeliness, sufficiency, accuracy, clarity and format. Information quality affects perceived usefulness and thus acceptance of an LMS (Al-Busaidi & Al-Shihi, 2010).

Service quality has to do with the quality of support services rendered to the end users of the system. In e-learning, the indicators of service quality are: responsiveness, reliability and empathy. Service quality directly influences user satisfaction and indirectly influences perceived usefulness (Al-Busaidi & Al-Shihi, 2010).

Al-Busaidi and Al-Shihi (2010) do not mention to what extent the factors described above will affect the acceptance of technology by instructors. For example, if an organisation wants to include motivators for staff to encourage the use of learning management systems, the organization will need to know to what extent it will need to motivate staff to use a LMS.

According to Ely (1990) eight conditions must be present to aid the adoption of technology. These conditions are:

- People must be unhappy with the status quo.
- They must possess the necessary knowledge and skills.
- There must be sufficient resources available.
- They must have the time.
- There must be rewards and incentives in place.
- People who are going to use the technology must be allowed to be involved in the decision making and thus, they will have a sense of ownership of the innovation.
- People should be committed.
- Leadership should support the process of implementation of the innovation.

All of the above conditions can be mapped to one of the categories in the model by Al-Busaidi and Al-Shihi (2010) except for the condition: dissatisfaction with the status quo. Clearly being dissatisfied with the current way of doing things will motivate one to want to adopt a new system, thus the model proposed by Al-Busaidi and Al-Shihi (2010) fails to incorporate this important factor in determining the successful adoption of technology.

Nanayakkara's (2007) study on influencers or inhibiters to the adoption of e-learning in tertiary education in New Zealand, revealed that the factors that influence the adoption of e-learning can be categorised into three groups as illustrated in figure 2-3: individual, system, organisational.
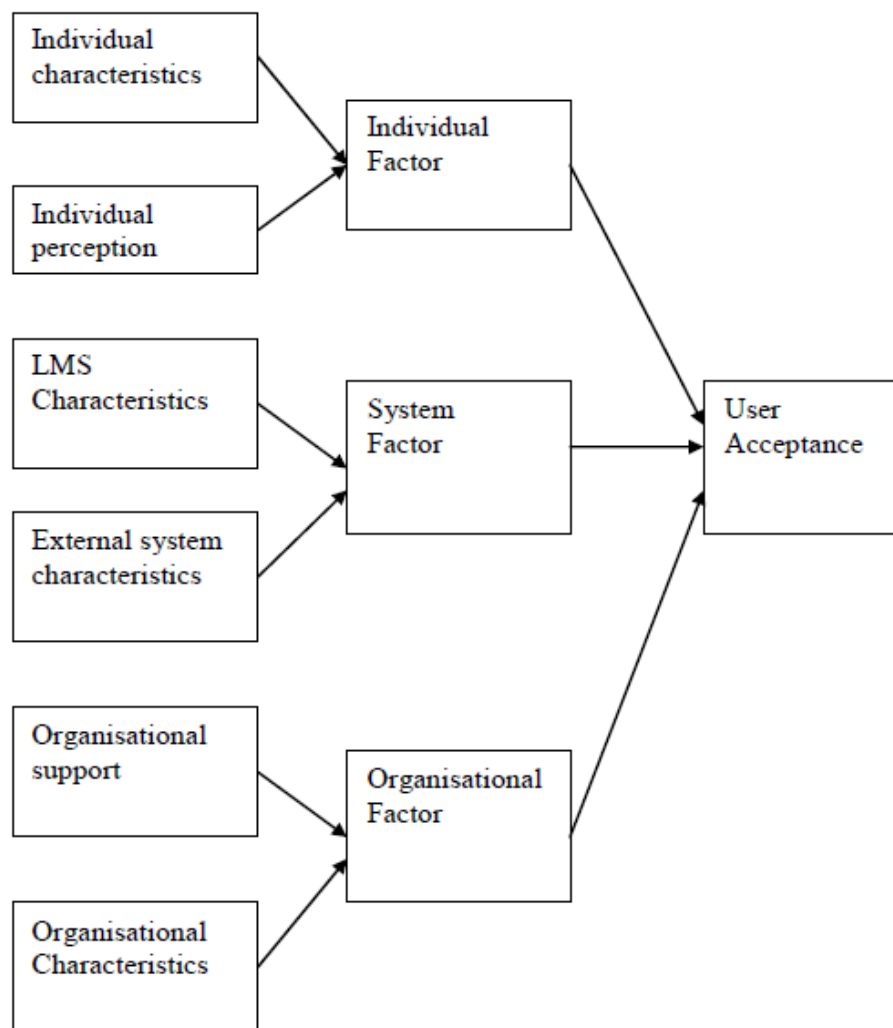
Figure 2-3: Framework for user acceptance of Learning Management Systems (Nanayakkar, 2007)

The study concluded that the five essential factors that were in the organisational and system groups were the highest determinants for the adoption of learning management systems. The 5 factors in order of importance were:

1. Relief time for academics to pursue e-learning,
2. Ease of use of the learning management system,
3. Usefulness of the learning management system,
4. Training and support for staff to create their online classrooms and resources,
5. Reliability and performance of information and communication technologies.

Thus it can be concluded from Nanayakkara's (2007) study that time off for academics to be involved in e-learning is the highest factor that determines intention and usage of a learning management system. Likewise, the LMS should also be easy to learn and use. Another key determinant of adoption of an LMS is the belief that the LMS will be useful. The more one believes that the LMS will be of use to them the greater the likelihood that the LMS will be adopted. The training and support the institution provides for staff to develop their online classrooms influences the adoption of the LMS. The fifth factor with the highest significance, is the reliability and performance of ICT and its history of failures.

2.7. Factors that inhibit the adoption of a LMS

An understanding of the barriers to the adoption of a learning management system is just as important as the influencers – these barriers can be turned into a motivator in the adoption of an LMS.

According to Osika, Johnson and Butea (2009) one of the top three factors influencing staff's decision not to adopt an LMS is students' abilities where staff sometimes become frustrated by students who cannot efficiently use the LMS, this in turn results in staff spending considerably more time with these students and thus less time is spent in learning how to better utilise the LMS.

According to Anderson (2012) some of the barriers to the use of a

LMS are:

1. Barriers related to personal aspects:
    - Time to pursue e-learning,
    - Attitudes of fellow colleagues,
    - Influence that e-learning initiatives have on promotion and employability.
2. Barriers related to resources:
    - Financial issues,
    - Technology,
    - Support.
3. Institutional related barriers:
    - The culture within the institution,
    - The capability of the institution,
    - Professional development and training.

An elaboration of each of these barriers follows:

Time as a barrier

In many surveys conducted time is regarded as an inhibitor to the acceptance of e-learning. Educators have pointed out that the time to pursue e-learning with regards to the development and support of e-learning is an inhibitor in the adoption of e-learning systems (Nanayakkara, 2007).

The lack of time to create online learning materials such as web pages and online assessments is an inhibitor to the adoption of e-learning by instructors. No study has been located that indicates that the time taken to create online learning environments is less than the time it takes to create a traditional learning environment. However, the many studies that were conducted indicated that online learning required an additional amount of instructors' time (Anderson, 2012). This finding was affirmed in a recent study by Govender and Govender (2014).

Release time, which is the temporary replacement of the online instructor with another while the online instructor prepares material and maintains the online classroom is preferred by many instructors, however, this form of release time is not commonly offered by many institutions. Thus the lack of release time for staff is seen as an impediment to the adoption of e-learning (Anderson, 2012).

Attitudes of colleagues

Anderson (2012) further maintains that the negative attitudes of colleagues towards e-learning may be a barrier to the adoption of e-learning. Negative attitudes may include other staff in the department that do not appreciate and recognise a staff member who is involved in e-learning. This lack of recognition can surface during staff performance appraisals when a staff member who is engaging in online learning is assessed by someone who has no online teaching experience resulting in the candidate's online teaching experience being underestimated (Anderson, 2012).

Institutional Culture

Institutional culture can be regarded as a motivator or an inhibitor to the adoption of e-learning. There are many areas in which the culture of the organisation affects the adoption of e-learning which are the effects of the structure of administration and its processes; the influence that more seasoned academic staff, including HOD's and deans, have on the acceptance of e-learning, and the influence that an organisation's policies has on the adoption of e-learning.

Financial Barriers

It is a commonly held view by instructors and administrators that giving them monetary rewards can help to motivate them to pursue online learning and teaching (Maguire, 2005). However, studies have shown that administrators were more easily motivated by monetary incentives than instructors. Instructors found that financial rewards were, not a motivator, nor an inhibitor to the adoption of e-learning (Anderson, 2012).

Promotion and Tenure

Many studies have indicated that the absence of online learning as criteria for promotion or tenure is a challenge at many institutions (Anderson, 2012).

Maguire (2005) indicates that the time an academic spends pursuing e-learning with regards to the development, maintenance and teaching of courses online is not as highly regarded as the time an academic spends doing research and teaching a traditional contact class. There is thus a perception among instructors that online teaching does impede academic progress in terms of promotion and tenure.

Professional development and training in technology

Instructors acknowledge that using e-learning technology is a problem for many and therefore the necessary professional development and training in the use of the technology is a solution. However, the lack of support in this regard is seen by many as a barrier (Anderson, 2012).

Osika *et al.* (2009) supports Anderson's (2012) assertion above and adds that staff incompetency is a major factor as to why staff choose not to integrate technology into their teaching. It was found that only 10 % of staff felt comfortable incorporating technology into their teaching with the remaining 90% who felt reluctant to use technology in their classrooms despite having ten or more years of teaching experience. Osika *et al.* (2009) reason that the lack of technology skills by these senior staff members can be attributed to not being trained or not being exposed to technology early in their careers.

According to Peluchette and Rust (2005) the size of the class can also inhibit the adoption of technology especially when it concerns the use of technology such as email, discussion forums, and chat rooms since these technologies make it difficult to manage large class sizes. However, research carried out by Greyling (2008) has shown that using an LMS to teach large classes at a university in Johannesburg have significantly improved the throughput of the students and resulted in enhancing the students' perceptions of the quality of teaching and learning.

2.8. Other related studies

In a survey carried out by Martin (2008) using Blackboard in a computer literacy course at a south-western university in USA, it was shown that using Blackboard assisted not only in teaching the course, but also helped in the development of the student's computing skills. Blackboard was found to be an effective learning management system by both students and instructors.

In a study conducted by Heirdsfield (2011) within the Faculty of Education at the Queensland University of Technology, students viewed Blackboard favourably and appreciated the accessibility and availability of resources that Blackboard offers. Students also valued the ability to interact with other learners via Blackboard and saw this as a benefit of the online environment. Staff likewise felt that the interactive features of Blackboard enhanced the learning experience, however, they viewed face-to-face interactions in class as the most valuable learning experience.

Although Uziak's (2009) study at a university in Botswana revealed that students found Blackboard useful, they preferred to have a combination of both traditional lectures as well as tutorials with Blackboard being used as a complementary tool to enhance teaching.

Van der Merwe (2011) in his research on online learning performance using microeconomics students at a university in Durban, South Africa found that performance is significantly associated with the length of time a student spends in the online classroom in addition to the marks he obtains for the online formative assessments. This finding affirms a study conducted by Oellermann (2009) who reported an improved pass rate for her management courses after using the self-assessment tool in Blackboard as part of her instructional technique.

Missula (2008) in her study in trying to understand the perceptions of staff at a University in New Zealand towards the use of Blackboard found that the level of usefulness influences how often staff use Blackboard and how effectively lecturers use course tools on Blackboard. The study also revealed that IT experience of staff

do not influence the usage of Blackboard. However in a similar study conducted by Katunzi (2011) at a University in Finland it was found that IT experience did influence the usage of Blackboard.

Much research including the research above indicate that Blackboard as a Learning Management System can enhance teaching and learning and thus improve the pass rates of students. However, the research was conducted at different institutions using subjects from different cultures and computer backgrounds – different from the students and staff at the Durban University of Technology. Therefore, it would be useful to determine the perceptions of staff towards the use of a LMS such as Blackboard in order to understand their behaviour in adopting Blackboard.

Related studies at DUT

In a study conducted by Hiralaal (2013) with teacher educators in the School of Education at the Durban University of Technology it was found that the adoption of e-learning is extremely slow. Only 10 – 15 % of the staff actively engaged with e-learning out of a total of 350 staff members that attended e-learning training in the School of Education. This may be attributed to the fact that e-learning is voluntary and left to those who show an interest in e-learning. Thus academic staff will require support, training and motivation so that they may actively engage with e-learning. However, Hiralaal's (2013) study was conducted using only 22 participants in the school of education and hence is a limitation to the generalizability of the results.

As mentioned above Hiralaal (2013) has identified the fact that e-learning is voluntary as one of several factors that may be influencing the slow adoption of e-learning at DUT. However, this cannot be the only factor, thus a more comprehensive study including the entire DUT staff population has to be done to fully understand the factors that may be preventing lecturing staff from adopting e-learning at the Durban University of Technology.

While a plethora of studies have been conducted in many university contexts and some directly related to DUT, no study has been conducted using a more inclusive

population in the university under study. An in-depth study is necessary to determine the lag in adopting Blackboard, given that Blackboard has been in use for 13 years.

2.9. Conclusion

This chapter reviewed literature relevant to the adoption of learning management systems at higher educational institutions. Literature on the affordances and limitations of online learning, staff and student perception of the use of Blackboard as well as supportive factors and inhibitors to the adoption of learning management systems were reviewed. Much of the literature reviewed included participants from countries that are perceived as technologically advanced. Hence the motivation to conduct the current study of technology adoption in this university in South Africa is necessary.

CHAPTER 3 : THEORETICAL FRAMEWORK

3.1. Introduction

This chapter describes the theoretical background concerning the acceptance of new technology by users. The two most common generalist adoption models are the Technology Acceptance Model (TAM) by Davis (1986) and Roger's Diffusion of Innovation model (Rogers, 2003), which are described below. The emergence of the unified theory of acceptance and use of technology (UTAUT) model from other theories of technology use is discussed thereafter. The UTAUT model was chosen for this study, since UTAUT explained approximately 70 percent of variance in behavioural intention to use technology in an organizational context and about 50 percent of variance in the use of technology (Venkatesh *et al*., 2003). Since the UTAUT model is chosen for this study, the short comings of the TAM model by Davis (1986) and the diffusion of innovation model by Rogers (2003) are provided as well.

3.2. User Adoption Theories

Studies carried out in the area of adoption of new technologies have resulted in many theoretical models that have emerged from the fields of information systems, psychology and sociology that try to justify an individual's intention to embrace and use new technology (Venkatesh *et al*., 2003).

The UTAUT model has evolved from eight other theoretical models, some of which are user acceptance models. The eight models are:

- Theory of Reasoned Action (TRA)
- Technology Acceptance Model (TAM)
- Theory of Planned Behaviour (TPB)
- Motivational Model
- Decomposed Theory of Planned Behaviour
- Model of User acceptance of PC
- Diffusion of Innovation

- Social Cognitive Theory

Researchers are faced with the problem of choosing from many user acceptance models. There is thus a need for an integrated view of user acceptance.

3.2.1. The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) proposed by Fishbein and Ajzen (1975) to explain a range of human behaviours was a model that emanated from the field of social psychology. TRA is used to explain one's behaviour towards the use of technology in a voluntary setting. The theory states (see Figure 3-1) that a person's behaviour towards a specific object (e.g. use of a LMS) is influenced by his/her intention to perform the behaviour (behavioural intention) and behavioural intention is predicted by both his/her attitude towards the use of the object (for example the LMS) and by the opinions of the people in his / her social environment which is referred to as subjective norm (Fishbein and Ajzen,1975).
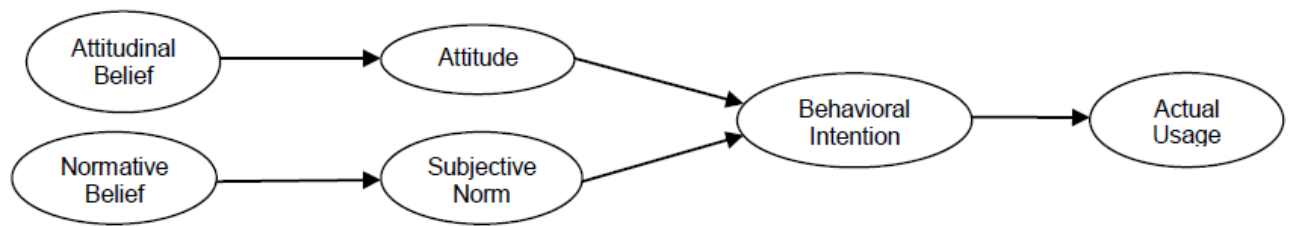
Figure 3-1: Theory of Reasoned Action (Fishbein and Ajzen, 1975)

Some of the limitations of TRA as indicated by Sheppard *et al.* (1998) are:

- There is no provision in the model for considering whether the probability of failing to perform is due to one's behaviour or due to one's intention.
- TRA fails to explain irrational or habitual actions that are not done consciously

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3.2.2. Theory of Planned Behaviour
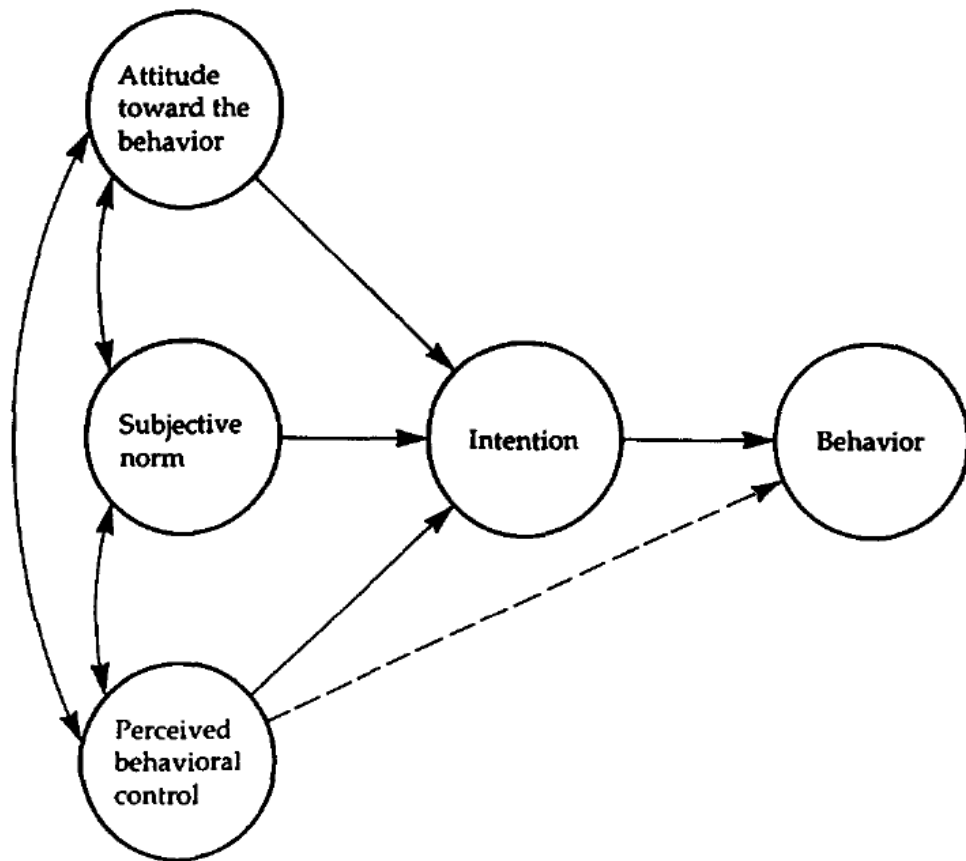
Figure 3-2: The theory of planned behaviour

An improvement of the TRA is the theory of planned behaviour (see figure 3-2). The Theory of Planned Behaviour (TPB) was formulated by Ajzen (1991) to consider the mandatory context that the Theory of Reasoned Action does not take into account. The theory adds an additional factor that determines intention which is perceived behavioural control. Perceived behavioural control is defined as the "perceived ease or difficulty of performing the behaviour" (Ajzen, 1991, p.183). The more resources and opportunities an individual thinks he possesses, the greater will be his perceived behavioural control over the behaviour (Ajzen, 1992). The more positive people's attitudes and subjective norms are towards a particular behaviour (for example use of Blackboard) and the greater their perceived behavioural control, the more likely they will intend to perform the behaviour (for example the use Blackboard).

3.2.3. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) that was formulated by Davis (1986) was created to model user acceptance of information systems.

TAM represented diagrammatically in figure 3-3 states that perceived usefulness and perceived ease of use are two determinants that are important for computer acceptance. Perceived usefulness (U) is defined as the degree to which one believes that using the system will assist one in one's job. Perceived ease of use (EOU) is defined as the degree to which one believes that using the system will be free of effort (Davis, Bagozzi, & Warshaw, 1989).

The TAM model postulates that computer usage is influenced by behavioural intention (BI). BI is determined by both a person's attitude towards using the system (A) and perceived usefulness (U) i.e.

$$BI = A + U$$

A is determined by U and EOU i.e.

$$A = U + EOU$$

$$U = EOU + External\ variables$$

$$EOU = External\ Variables$$
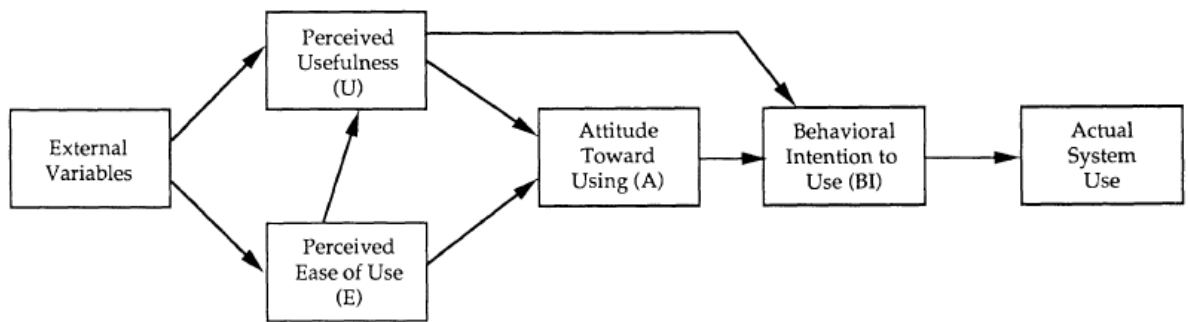
Figure 3-3: Technology Acceptance Model (TAM)   **Source: (Davis, 1989)**

The limitation of the TAM model is the absence of social influence and organizational factors such as compulsory use of technology. These factors, significantly influence information technology usage and adoption. This resulted in a demand for a model that considered more factors that influenced technology acceptance which lead to the formulation of the UTAUT model.

3.2.4. Motivation Model

The Motivation model indicates that one's behaviour towards an object is based on intrinsic and extrinsic motivations (Davis *et al.*, 1992). According to Vallerand, Deshaies, Cuerrier, Pelletier and Mongeau (1992) intrinsic motivations relate to enjoyment and satisfaction that one obtains from performing the behaviour. For example, if an academic is intrinsically motivated to use Blackboard for teaching, then he is using the LMS because he derives some kind of pleasure and satisfaction from using it.

When extrinsically motivated one does not perform the behaviour to obtain some kind of pleasure, but does so to derive rewards that are external to the activity itself (Davis *et al.*, 1992). For example, a lecturer may choose to use Blackboard for teaching because he wants to be viewed favourably by his head of department or because it may result in him being promoted.

3.2.5. Decomposed Theory of Planned Behaviour

The Decomposed Theory of Planned Behaviour is a hybrid model that combines the predictors of TPB (Figure 3-2) with the constructs of ease of use and perceived

usefulness from TAM (Figure 3-3). This model is referred to as the Decomposed Theory of Planned behaviour since the predictors, attitude, subjective norm and perceived behavioural control from the TPB are now further decomposed (See Figure 3-4). Attitude is decomposed into ease of use, perceived usefulness and compatibility. Subjective norm includes peer and superior influence. Perceived behavioural control is decomposed into self-efficacy, technology facilitating conditions and resource facilitating conditions (Taylor & Todd, 1995).
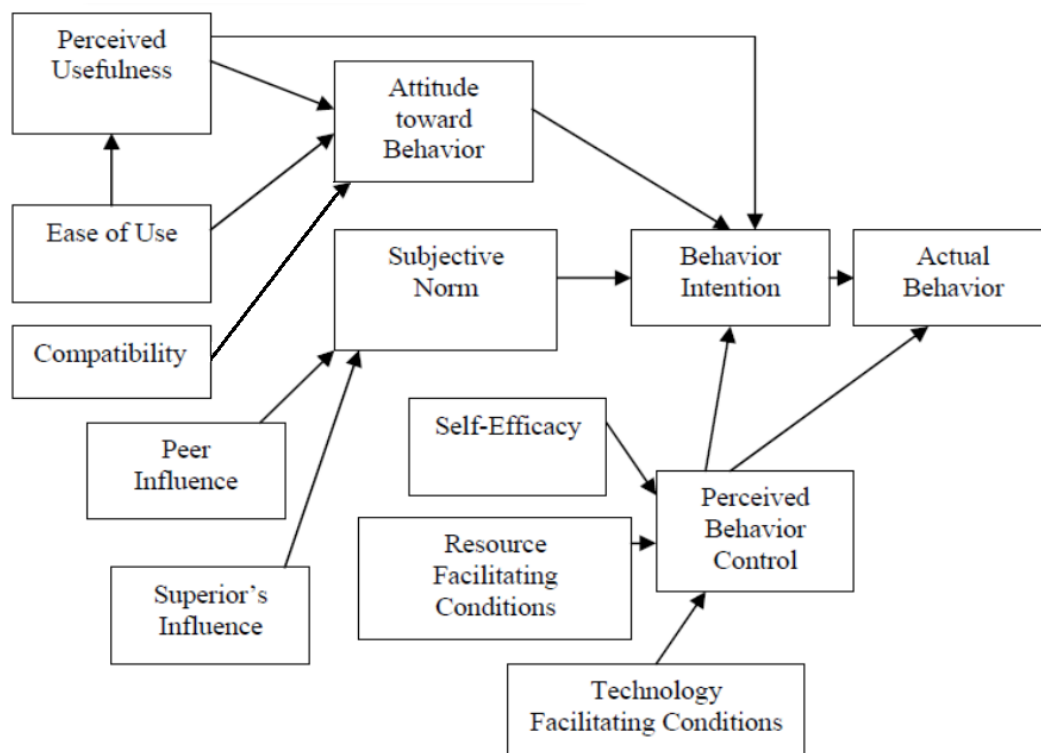
Figure 3-4: Combined TAM and TPB (Taylor and Todd, 1995)

3.2.6. Model of User Acceptance of PC

A competing perspective to the Theory of Planned Behaviour and the Theory of Reasoned Action, is Triandis (1979) theory of attitudes and behaviour. Triandis (1979) distinguishes beliefs that are related to emotions and beliefs that are linked to future consequences of performing the behaviour. He argues that behavioural intentions are influenced by the feelings one has towards the behaviour (known as affect), what they think they should do (Social norm), and by the expected consequences of performing the behaviour. He adds that behaviour is influenced by

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what they have usually done (habits), by behavioural intentions and by the facilitating conditions (Thompson, Higgins, & Howell, 1991).

Triandis's model has been adapted by Thompson *et al.* (1991) to predict computer utilisation behaviour (See figure 3-5). Below follows a description of the various constructs in the model:

- **Job-fit**: "the extent to which an individual believes that using the technology can enhance the performance of his or her job" (Thompson *et al.*, 1991, p.129).
- **Complexity:** "the degree to which an innovation is perceived as relatively difficult to understand and use" (Thompson *et al.*, 1991, p.128).
- **Long term consequences:** "outcomes that have a pay-off in the future" (Thompson *et al.*, 1991, p.129).
- **Affect Towards Use**: "feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act" (Thompson *et al.*, 1991, p.127).
- **Social factors:** "individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations" (Thompson *et al.*, 1991, p. 126).
- **Facilitating conditions:** "the provision of support for users of PCs may be one type of facilitating condition…" (Thompson *et al.*, 1991, p.129).
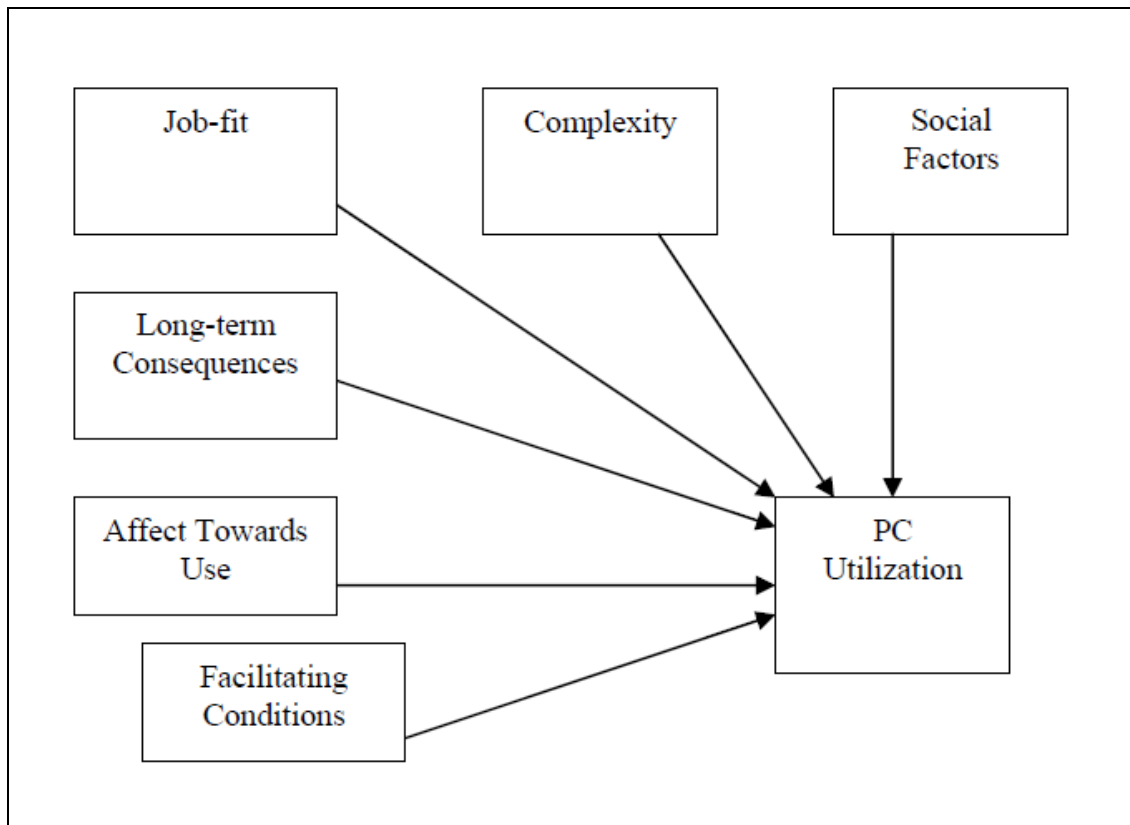
Figure 3-5: The model of PC Utilization (Thompson _et al._, 1991)

3.2.7. Diffusion of Innovation

According to Rogers (2003) adopters of new technology go through various stages:

- Knowledge – When the user of the new technology learns about it.
- Persuasion – This is when the user decides what his opinion is, about the technology.
- Decision – The potential user decides to adopt the technology.
- Implementation – The individual actually adopts the innovation.
- Confirmation – The user of the new technology looks for reasons to support his adoption decision or he may stop using the technology.

However, Roger's model is more concerned with the issues leading up to adoption of the innovation and lacks an understanding of how the innovation is actually implemented and what happens after implementation (West, Waddoups, & Graham, 2007).

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The stages in the adoption of technology are more concerned with what leads an individual to use an innovation. Implementation is the actual integration of the innovation into an individual's life such, that it becomes a routine part of his experience (West, Waddoups, & Graham, 2007).

The model by Rogers (2003) is well suited to try to understand the adoption decision process of those staff members that have adopted Blackboard, however, it is not well suited to try to understand the reasons as to why an individual may not want to adopt the use of Blackboard at DUT.

3.2.8 Social Cognitive Theory

The Theory of Planned behaviour, TAM and the Innovation Diffusion Theory, all assume that the causal relationships among the major variables in these models, are not bi-directional. However, the social cognitive theory by Bandura (1986) states that personal factors, environmental factors and behaviours are determined reciprocally, which means that one's cognitive competence influences one's behaviour towards using technology and the successful interactions with the technology also influence one's cognitive perceptions (Compeau *et al.,* 1999).

3.2.9. Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT (Unified Theory of Acceptance and Use of Technology) theory developed by Venkatesh *et al.* (2003) shown in figure 3-6 explains the users intentions to use an information system and subsequent usage behaviour. UTAUT encompasses the eight previous models of IT usage behaviour. It renames the old key constructs from the TAM model as follows:

- Perceived Usefulness becomes Performance Expectancy.
- Perceived ease of use becomes Effort expectancy.
- SN has become Social Influence.
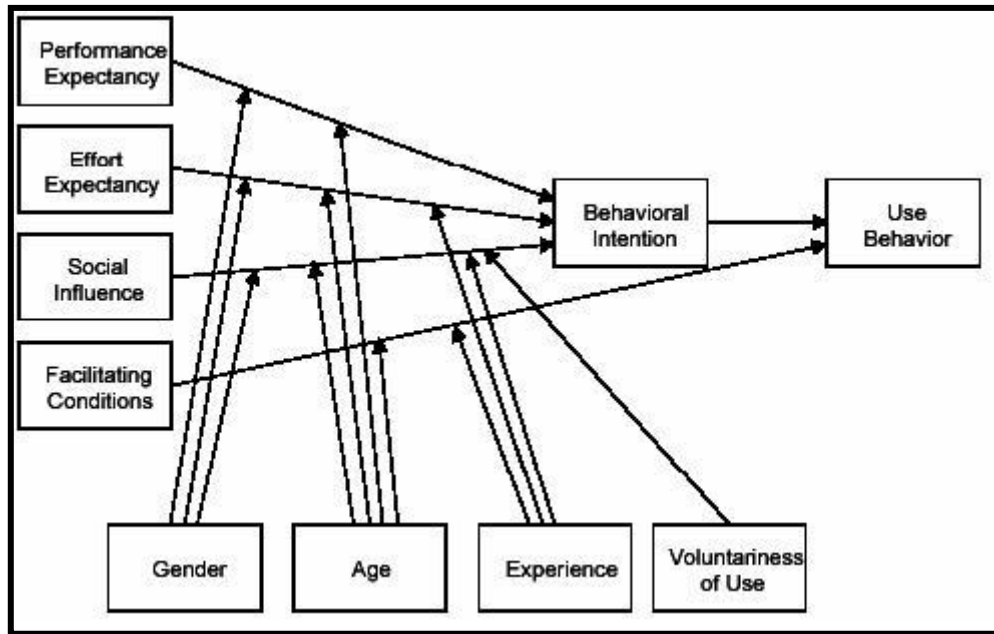
Figure 3-6: UTAUT Model   **(Venkatesh et al, 2003)**

The UTAUT model also includes an additional construct called Facilitating
Conditions to predict Behavioural Intention to overcome the limitation of the TAM
model.

The theory states that four constructs are direct determinants of user acceptance and
usage behaviour when using an information system. As can be seen in figure 3-6, the
four constructs are:

- Performance expectancy,
- Effort expectancy,
- Social influence, and
- Facilitating conditions.

Performance expectancy is defined as the degree to which one believes that using the
information system will assist one in doing one's job (Venkatesh *et al*., 2003).
Performance expectancy will be measured in this study using a number of variables
to ascertain the staff member's views as to whether he/she feels that using the LMS
will assist him/her in doing his/her job. The following items of measurement will be
used to determine performance expectancy:

- Blackboard enables me to improve the effectiveness of my lecturing.
- I can achieve more tasks quickly by using Blackboard.
- Blackboard supports the pedagogical principles in my lecturing.

Responses related to variables designed to measure performance expectancy will help to identify factors that may be inhibiting or enhancing the use of Blackboard.

Effort expectancy is defined as the degree of ease associated with the use of the system (Venkatesh *et al*., 2003). Effort expectancy will be measured in this study by asking the staff if they feel that Blackboard is easy to use.

Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system (Venkatesh *et al*., 2003). Staff will be asked questions relating to social influence to determine factors that are encouraging the use of Blackboard or to identify factors that may be barriers to the adoption of Blackboard at DUT.

Facilitating conditions are defined as the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system (Venkatesh *et al*., 2003). The facilitating conditions to the use of Blackboard at DUT will be determined by the following questions that staff will be asked:

- Management has supported my use of Blackboard.
- I have received training on the use of Blackboard.
- I have all the necessary resources to use Blackboard.
- The IT infrastructure supports my usage of Blackboard.
- I can call upon the assistance of a person or group at my campus if I am having difficulty using Blackboard.

According to Venkatesh *et al.* (2003) gender, age, experience and voluntariness of use are postulated to moderate the influence of the four key constructs on usage intention and behaviour. For example, theory suggests that women tend to be more sensitive to others' opinions and therefore, find the social influence construct to be

more salient when forming an intention to use new technology and this effect decreases with experience (Venkatesh, *et al*., 2003).

The UTAUT model was used in a study by Katunzi (2011) on the adoption of e-learning technologies at a University. The aim of the study was to understand the factors that influence teachers to adopt a learning management system. The four key constructs from the UTAUT model were used to investigate how teachers are influenced to adopt an LMS. In this study, an additional construct of trust was added to the framework. Perceived usefulness, facilitating conditions and a user's gained experience were found to highly influence a teacher's decision to adopt an LMS. Perceived ease of use, social influence and trust were found not to have a huge impact on whether a teacher adopts an LMS (Katunzi, 2011). The construct Trust was not included in the current study due to the fact that the Blackboard LMS has not fully been adopted and no courses at DUT are being offered fully online.

In a more recent study by Govender and Govender (2014) on the faculty perceptions of an open source LMS and factors that may influence their use or intention to use the LMS, the UTAUT model was used. The study revealed that the four constructs from the UTAUT model (See fig 3-6) are correlated with the intention to use the LMS at different levels of significance. However, unlike the study by Katunzi (2011) the construct facilitating conditions weakly correlated with the intention to use the LMS.

The two main objectives of the current research are to identify factors that positively influence the intention to use Blackboard and to likewise identify factors that inhibit the use of the LMS Blackboard. In identifying these factors the key constructs from the UTAUT model were used since the four key constructs are direct determinants of the intention to use or not to use the specified innovation.

In the current study, age, gender and voluntariness of use were not considered, since the number of male, and female respondents were equivalent, and the results showed similar statistics regarding those who used and those who did not use Blackboard.

Similarly, the majority of respondents fell in the age category between 35 and 60 years; hence gender and age were not considered in the model as indicated in the figure below.
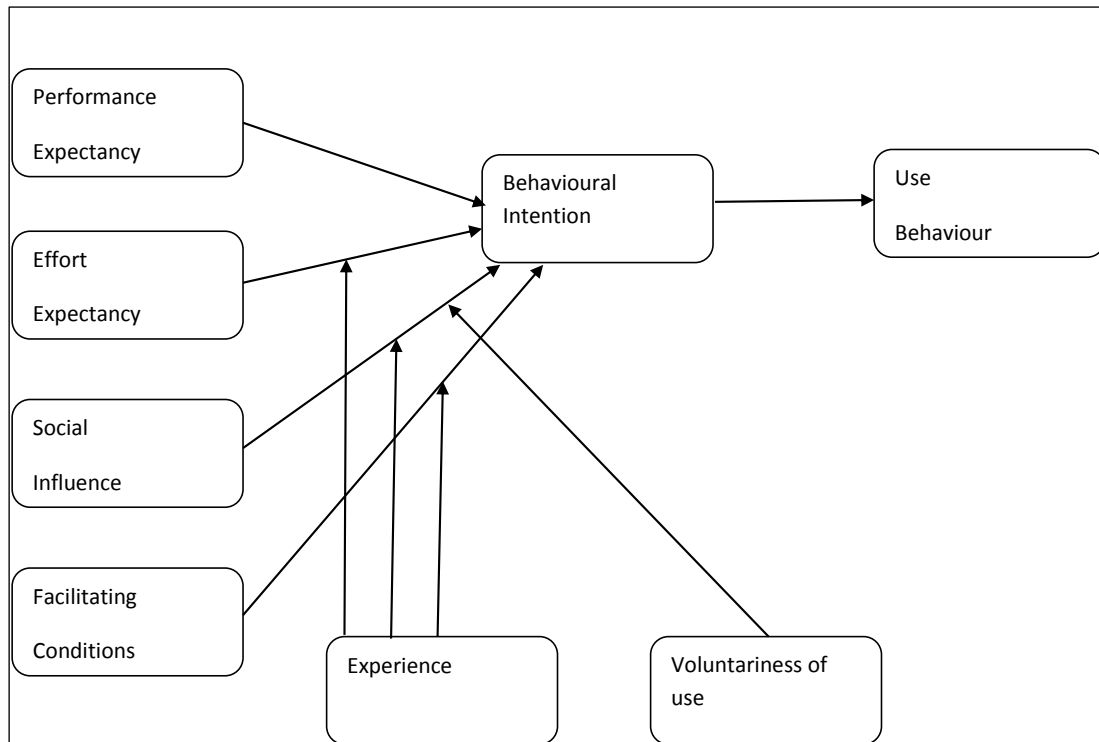
Figure 3-7: UTAUT model adapted from Venkatesh *et al.* (2003)

3.3. Conclusion

Many user adoption theories were reviewed including:

- Technology Acceptance Model (TAM) by Davis,
- Diffusion Of Innovation by Rogers (2003),
- Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh *et al.* (2003).

The Diffusion of innovation model by Rogers (2003) is more suited in trying to understand the adoption decision process of those staff members that have adopted Blackboard, however, it is not well suited to try to understand the reasons as to why a staff member may not want to adopt the use of Blackboard at DUT.

The Technology Acceptance Model (TAM) by Davis (1986) does not take into account the social influence and organisational factors that influence an individual's decision to adopt the use of technology. Thus there is the need for a framework that considers more factors that influence technology adoption.

However, the theoretical framework chosen to guide the study was the UTAUT model by Venkatesh *et al.* (2003). This model takes into account factors that are not considered in the TAM model by Davis (1986) and the DOI model by Rogers (2003). The UTAUT model, as indicated in figure 3-2, considers additional independent and moderating variables that should be considered to determine behavioural intention and subsequent usage behaviour (Venkatesh *et al.*, 2003).

In this chapter I explored current relevant theories and models associated with the acceptance of new technology by users. The two most common generalist adoption models discussed were the Technology Acceptance Model (TAM) by Davis (1986) and Roger's Diffusion of Innovation model (Rogers, 2003). I demonstrated that these lack crucial elements and therefore chose the UTAUT model by Venkatesh *et al*. (2003) for the reasons described above. In the following chapter I discuss the research methodology used in the study in the light of the theoretical approach outlined above.

CHAPTER 4 : RESEARCH METHODOLOGY

4.1. Introduction

This chapter provides a description of the research methodology used in this study. It focuses on the theoretical approach that is used to guide this research as well as the approach adopted to answer the research questions.

4.2. Research Design

According to Bryman and Bell (2011) the research design includes the framework for the collection and analysis of data so as to answer the research questions. The main research question is to determine the factors that may or may not influence academics to use the LMS, Blackboard. This is further broken down into the following sub-questions:

- How does performance expectancy (PE) influence the use of Blackboard?
- How does effort expectancy (EE) influence the use of Blackboard?
- What are the social influences (SI) that instigate the adoption of Blackboard?
- What are the facilitating conditions (FC) that influence the use of Blackboard?
- How do students' perceptions influence staff adoption of Blackboard?
- To what extent does each of the constructs and the constructs as a whole affect the adoption of Blackboard?

A mixed methods approach was adopted to answer these questions. The chief method of data collection was a self-administered questionnaire which resulted in largely quantitative data from staff and students. Qualitative data was gathered from in-depth interviews which were conducted with 6 academic staff members.

A mixed methods approach was used to carry out this research. Mixed methods was found to be appropriate as both quantitative and qualitative data was required to obtain a deep understanding of the staff perceptions of the use of LMSs. A similar

study by Missula (2008) was successfully conducted in New Zealand using this approach. In her study Missula (2008) used qualitative data collection by conducting interviews with staff members, followed by a quantitative survey which included questions that were formulated from the statements and themes of the qualitative data findings. Data obtained from a qualitative study followed by a quantitative survey provides a deeper insight to the results generated (Bryman, 2011). Hence a similar approach was used in the current study as the staff interviews were conducted first and the results from this influenced the design of the quantitative questionnaire, which was thereafter used in the conducting of the quantitative surveys.

4.3. Population

A population is defined as any group that is the subject of research interest (Leedy, 2005). The population in this study were the lecturers at Durban University of Technology. Lecturers from the five faculties make up the population. A total of 420 lecturers were surveyed.

The aim of the study is to investigate the perceptions of staff towards the use of Blackboard for teaching and learning so as to understand the reasons for the slow adoption of Blackboard by staff.

In order to accomplish the main objective of the study, respondents should be computer literate and be able to access the internet in order to be suitable for the study. All staff members (that is the population) have access to the internet and the selected sample will therefore, be useful in the study.

4.4. Sampling and size of sample

Bryman (2011) defines sampling as the segment of the population that is selected for investigation. A sample is a subsection of the population and thus representative of the population. By studying a sample, we can thus draw conclusions that can be generalised to the entire population (Sekaran, 2000). It is easier and cheaper to study a sample rather than study the entire population. Analysing the data of a sample is also quicker and more accurate as compared to an entire population. In this study, the researcher attempted to obtain responses from all lecturers from the various faculties.

According to Sekaran (2010) for a population of 420, a sample size of 194 is appropriate. However, in this study a response rate of 100 was obtained – yielding a response rate of 51.5% which is acceptable. Hence a sample of 100 lecturers was used in this study since there were 100 respondents that completed the online questionnaire.

Any sample design falls into one of two categories of sampling designs which are: probability and non-probability sampling. If all the participants in a given population have a chance of being selected as sample subjects then this is referred to as probability sampling. The most common type of probability sampling is the simple random sample.

In non-probability sampling, all the participants do not have an equal chance of being selected as subjects. The selection of elements is arbitrary and is the best way of obtaining some basic information quickly. Sekaran (2000) describes convenience sampling as involving the collection of information from members of the population who are conveniently available to provide it. With this type of sampling, the researcher would not have to spend time choosing the participants. In this study, different sampling techniques were used. Simple random sampling was used in administering the questionnaire to academic staff members using the quantitative approach. All academic staff members at DUT had the option of completing the online questionnaire.

Convenience sampling was used to select the participants for the interview to obtain qualitative data. Purposive sampling was used for the quantitative data collection from students. A single class comprising of 22 students was chosen as the student sample to obtain students' perceptions towards the use of Blackboard. This class of 22 students, was chosen for the following reasons:

- They were all pursuing a first year module and it would be important to ascertain their perceptions towards the use of Blackboard.
- They were being taught using Blackboard for other modules they were pursuing and thus had an idea of what the LMS is all about.

4.5. Quantitative data collection

The following instruments were used in the gathering of quantitative data:

- A staff questionnaire,
- A student questionnaire.

The questionnaires were designed and issued to all staff (excluding the staff that were interviewed) after conducting the staff interviews.

4.5.1. Questionnaires

Questionnaires are also referred to as self-completion questionnaires and are a common way of obtaining responses from the participants. Open-ended and closed questions are the two types of questions that can be asked, however self-completion questionnaires tend to have fewer open ended questions (Bryman, 2011).

With open-ended questions respondents can respond in their own terms. Closed questions require respondents to choose their responses from a fixed set of alternatives. For this study, the majority of the questions are closed Likert-type questions which are asked in both the staff questionnaire as well as the student questionnaire.

Leedy (2005) provides many guidelines when drawing up a questionnaire. Although all the guidelines were taken into consideration when designing the questionnaires, the following four are the most important and therefore worth mentioning:

- The research problem must be kept in mind when drawing up the questions.
- The language used should be clear, simple and unambiguous. The language therefore must be appropriate for the target population.
- Provide the respondents with clear instructions on how to complete the questionnaire. For example, one should not assume that they are familiar with Likert scales.
- Double-barrelled questions should not be asked. An example of such a question in a Likert-type scale is "Management and the IT infrastructure

supports my usage of Blackboard." In this case, the respondent may agree with the first part and disagree with the second.

It is advisable that the questionnaire should not be lengthy, as fatigue may set in. The questionnaire for this study is not lengthy. In the pilot study the respondents completed the questionnaire in an average time of 10 minutes.

4.5.2. Testing the questionnaire

The target population for this study was permanent academic staff at the Durban University of Technology. The questionnaire was therefore pre-tested with five academic staff members at this institution. The staff members used for the pilot study were all from the Pietermaritzburg campus and they were from the Faculty of Accounting and Informatics and the Faculty of Management Sciences.

They were selected on the following basis:
- A staff member who has been for training on Blackboard, but who is not using the LMS to teach.
- A staff member who has never been for training on Blackboard.
- A staff member who has been for training on Blackboard and is using the LMS to teach.
- A Lecturer in Information Technology who provided valuable input regarding the content of the questionnaire.
- A Lecturer in English who assisted with issues relating to the suitability of the language used.

The objective of this exercise was to test the following:
- The duration it will take to answer the questions. The researcher averaged the time to answer the questions to be ten minutes.
- Whether the language is appropriately used. The respondents felt that the questionnaire was not difficult to comprehend. The English Lecturer was most helpful in correcting the grammatical errors.

- The relevance of the questions regarding the research objectives and the research questions. In this case the respondents felt that the questions were aligned with the objectives and the research questions. The Lecturer in Information Technology provided valuable input on the section regarding staff members' "use of Blackboard for teaching".

4.5.3. The Layout of the Questionnaire

This section focuses on how the questionnaires were designed. The research instrument for both staff and students consisted of 81 items, with a level of measurement at a nominal or an ordinal level. The questionnaires consisted of 5 sections which measured various themes as illustrated in table 4-1 below:

Table 4-1: Questionnaire Layout

Staff Questionnaire	Student Questionnaire
Section A: Background Information	Section A: Background Information
Section B: General Questions	Section B: General Questions
Section C: Use of Blackboard in teaching	Section C: Use of Blackboard in Learning
Section D: Course tools that are used	Section D: Frequency of use of Course Tools
Section E: Not using Blackboard	Section E: Overall effectiveness of each tool / component within Blackboard

Table 4-2 indicates how the various constructs from the research model were used in the formulation of the questions from the questionnaire. An explanation of each section of the questionnaire then follows.

The research model used in the study is the UTAUT model as can be seen in Figure 3-6 of chapter 3. According to the UTAUT model, the four key constructs are direct determinants as to whether an individual intends to use information technology. The four key constructs from the research model that were used in the design of the questionnaire are:
- Performance expectancy,

- Effort expectancy,
- Facilitating conditions,
- Social influence.

Table 4-2 below lists the questions from the various sections of the questionnaire and the construct that was considered in the formulation of the question.

Table 4-2: Staff Questionnaire Design

SECTION	QUESTION NUMBER	CONSTRUCT FROM RESEARCH MODEL
B	1	Moderating construct gender
B	2	Moderating construct Age
B	7,8,9,10	Moderating construct Experience
C	15.1, 15.11	Moderating construct Voluntariness of use
C	15.2,15.3,	Key construct Performance expectancy
C	15.4	Key construct Effort expectancy
C	15.5, 15.7,15.8, 15.9, 15.10,	Key construct Facilitating condition
C	15.6	Key construct Social influence
E	18.1, 18.2, 18.10	Key construct Performance expectancy
E	18.3	Key construct Effort expectancy
E	18.4, 18.6,18.7, 18.8,18.9	Key construct Facilitating condition
E	18.5	Key construct Social influence

It is important for a questionnaire to include background information to the study as well as clearly defined objectives. The background to the study and objectives are contained in section A.

The demographical data (such as age, gender and status) and specific data related to the use of technology (such as computer proficiency and experience using Blackboard) are obtained first. Bryman (2011) suggests that these types of questions are important since they help to put the responses into context. These contextual type of questions are asked in section B of the questionnaire.

Staff perceptions towards the usage of Blackboard are elicited in section C of the questionnaire. The objective of these questions is to determine the perceptions of those staff members that are using Blackboard in their teaching. This section contains 14 questions. The four key constructs from the research model was used to draw up the questions for this section. For each of the questions, respondents used a five-point Likert scale to rate their attitude from "Strongly Agree" to "Strongly Disagree".

Section D contains a total of thirty eight questions. The objective of these questions was to elicit the staff members' responses concerning the course tools that they are using on the Blackboard Learning Management System. This is in keeping with one of the objectives of the study which is to determine the level of usage of Blackboard amongst staff members.

Section E extracts the responses of those staff members that are not using blackboard in their teaching. This section contains 10 questions. The four key constructs from the research model were used to draw up the questions for this section. For each of the questions, respondents used a five-point Likert scale to rate their attitude from "Strongly Agree" to "Strongly Disagree".

4.5.4. Distribution of the Questionnaire

The questionnaires were distributed online using Google documents. Online distribution facilitated the capturing and processing of data (Wright, 2005).

A total of four hundred and twenty (420) staff questionnaires were distributed. One hundred and eight (108) questionnaires were completed and returned. Eight (8) questionnaires were either incomplete or incorrectly filled. The data from the eight (8) spoilt copies could therefore, not be used in the investigation. The data of the remaining one hundred (100) questionnaires were used in the study.

The breakdown of the un-spoilt returns is provided in Table 4-3.

Table 4-3: Questionnaire Returns

Faculty	Number Of Returns	Total Possible Returns
Accounting & Informatics	18	81
Applied Sciences	9	51
Arts	22	80
Engineering	16	71
Health Sciences	14	61
Management Sciences	21	76

4.6. Qualitative Data Collection

Qualitative data was collected using interviews with many open ended questions to obtain an in depth understanding of staff perceptions of Blackboard. The responses from the interviews were analysed to form categories and themes which were used to corroborate some of the quantitative research findings.

Leedy (2005) discusses the various methods of data collection in qualitative research. These include:

4.6.1. Interviews

Interviews can produce a large amount of useful information. The researcher can ask questions related to any of the following:

- "Facts (e.g. biographical information)"
- "People's beliefs and perspectives about facts"
- "Feelings"
- "Motives"
- "Behaviours"
- "Standards for behaviour"
- "Conscious reasons for actions or feelings".

This method also involves asking a large number of open ended questions, using audiotapes or handwriting to record the views of participants.

Interviews were conducted at DUT as a means of triangulation with the data obtained from the quantitative surveys.

4.6.2. Interview Participants

The participants chosen for the interviews were academic staff members from two faculties at the Pietermaritzburg campus. They were:

- The Faculty of Management Science and,
- The Faculty of Accounting and Informatics.

The above faculties were chosen because of the perception that a greater percentage of staff from these faculties are using Blackboard.

A total of six participants were chosen for the interview. They were chosen on the following basis:

- Staff members who are currently using Blackboard to teach.
- Staff members who have been for training on Blackboard, but are not using Blackboard to teach.
- Staff who have not been for training on Blackboard.

4.7. Data Analysis

4.7.1. Quantitative Data Analysis

The quantitative data collected from the staff and student responses were analysed with the Statistical Package for Social Sciences (SPSS) version 22.0 as well as Microsoft Excel. The software SPSS has facilities for the extensive manipulation and transformation of data. Fully labelled graphs and tables can also be easily done. Most researchers use SPSS because of its power and flexibility. The results for this study will be presented in the form of graphs, cross tabulations and other figures.

4.7.2. Qualitative Data Analysis

The data obtained through interviews were sorted, arranged and categorized into themes from a questionnaire framework. The second step involved going through the data to obtain general ideas from interviewees. The third step involved coding the

data in which textual data was organized into categories and labelled. The coded categories were then taken and aligned with themes that emerged.

4.8. Limitations

Although the results of this study will be useful to other academic institutions as well as developers of learning management systems there are a number of limitations. These include:

- The study only considered one learning management system which is Blackboard and therefore the findings may not be generalizable since the practicality of other learning management systems may be quite different from Blackboard and thus the adoption process different as well. This limitation did not have an impact on the study since the focus of the study was on staff perceptions of Blackboard.
- The study only focused on lecturers and students and other categories of staff may have different perceptions. The perceptions of other categories of staff were not relevant for this study and hence did not influence the current study.

4.9. Validity and Reliability

Validity refers to the issue of whether or not an indicator that is designed to measure a concept actually measures that concept. Reliability refers to the consistency in the measurement of a concept (Bryman & Bell, 2011). Reliability is determined by taking several measurements on the same subjects. A reliability coefficient of 0.70 or higher is considered as "acceptable".

Table 4-4 below reflects the Cronbach's alpha score for all the items that constituted the staff questionnaire:

Table 4-4: Cronbach's alpha score for staff questionnaire

Question	Number of Items	Cronbach's Alpha
What percentage of subjects you lecture are taught using Blackboard	6 of 6	0.813
Staff that are using Blackboard to teach	14 of 14	0.893
Frequency of use of course tools	18 of 18	0.934
Effectiveness of course tools	19 of 19	0.925
Staff that are not using Blackboard to teach	10 of 10	0.837
Overall	60 of 60	0.963

The overall reliability (0.963) exceeds the recommended value of 0.70. This indicates a high (overall) degree of acceptable, consistent scoring for the research. All of the themes (sub-sections) have values that exceed the acceptable standard.

The results obtained from the reliability analysis of the student questionnaire items are presented in Table 4-5:

Table 4-5: Cronbach's alpha score for student questionnaire

Question Number	Number of Items	Cronbach's Alpha
12	6 of 6	0.728
15	22 of 22	0.881
16	16 of 16	0.944
17	16 of 16	0.932
Overall	60 of 60	0.967

From the data in Table 4-5 it can be seen that the overall reliability (0.967) exceeds the recommended value of 0.70 - indicating a high (overall) degree of acceptable and consistent scoring for the research.

To ensure the validity of this study multiple sources of quantitative data obtained from academic staff and students via questionnaires and qualitative data obtained from academic staff as a result of staff interviews were analysed. The qualitative data

was validated after transcribing by sending the data to the interview participants to confirm whether their perceptions were properly translated.

4.10. Conclusion

This chapter discussed the research design and the methodology followed in answering the research questions. The quantitative and qualitative data collection methods was then discussed in detail. The chapter concludes with a discussion on the validity and reliability of the study. The next chapter presents the analysis of the data obtained and the findings.

CHAPTER 5 : DATA ANALYSIS

5.1. Introduction

Chapter 4 described the research design and the methodology used in the study and focussed primarily on how the data was collected for analysis. This chapter presents the results of the research after the data was captured and analysed. The software Statistical Package for Social Sciences (SPSS) version 22.0 was used to perform the analysis. The majority of the tables was obtained from MS Excel software. The results are presented in the form of graphs and tables together with interpretations and explanations.

Qualitative data analysis was performed on the data obtained from the staff interviews. The qualitative data obtained were sorted, arranged and categorized into themes.

5.2. Descriptive Statistics

Table 5.1 indicates the demographical information of the participants. Demographic information is important in the analysis as it assists in the overall understanding of the results.

Table 5-1: Profile of participants

		Do you use Blackboard?				
		Yes		No		Total
		Count	Percent	Count	Percent	
Gender	Male	7	41.2%	30	50.8%	37
	Female	10	58.8%	29	49.2%	39
	Missing					2
Age group	18 – 24	1	5.3%	1	1.3%	2
	25 – 34	1	5.3%	4	5.1%	5
	35 – 60	16	84.2%	65	82.3%	81
	Above 60	1	5.3%	9	11.4%	10
	Missing					2
Academic level	Junior Lecturer	2	10.53%	0	0%	2
	Lecturer	13	68.42%	51	69%	64
	Senior Lecturer	3	15.8%	20	27%	23
	Professor / Associate Professor	1	5.3%	3	4%	4
Faculty	Engineering	0	0%	15	19%	15
	Arts	6	33.3%	16	20.25%	22
	Management Sciences	4	22.2%	16	20.25%	20
	Accounting & Informatics	2	11.1%	15	19%	17
	Health Sciences	4	22..2%	10	12.7%	14
	Applied Sciences	2	11.1%	7	9%	9
Lecturing Experience	0 – 5	4	22.2%	8	10.1%	12
	6 – 10	4	22.2%	13	16.5%	17
	11 – 15	3	16.7%	17	21.5%	20
	16 – 20	3	22.2%	18	22.8%	21
	> 20	4	22.2%	23	29.1%	27
Perceived Computer proficiency	I never used a computer	0	0.0%	1	1.3%	1
	I am a beginner	0	0.0%	0	0%	0
	Fairly knowledgeable	12	63.16%	46	58.2%	58
	Very Proficient	7	36.84%	32	40.5%	39

Overall 82.3% (Table 5-1) of all the participants between the ages 35 and 60 years do not use Blackboard. This statistic could be attributed to the fact that they are much older than the digital natives and may not be receptive to embracing new technology easily. A noteworthy aspect that may be observed from table 5-1 is that those who are lecturing for longer than 10 years do not use Blackboard. It is likely that they are

resistant to change despite the fact that most academics (95%) have self-assessed themselves to be fairly knowledgeable and proficient in computing.

5.2.1. Frequency of males and females

Table 5.2 below describes the gender distribution by age:

Table 5-2: Gender distribution by age

			Gender		
			Male	Female	Total
Age	18 - 24	Count	1	0	1
		% within Age	100.0%	.0%	100.0%
		% within Gender	2.6%	.0%	1.3%
		% of Total	1.3%	.0%	1.3%
	24 - 34	Count	1	4	5
		% within Age	20.0%	80.0%	100.0%
		% within Gender	2.6%	10.3%	6.4%
		% of Total	1.3%	5.1%	6.4%
	35 - 60	Count	30	33	63
		% within Age	47.6%	52.4%	100.0%
		% within Gender	76.9%	84.6%	80.8%
		% of Total	38.5%	42.3%	80.8%
	Above 60	Count	7	2	9
		% within Age	77.8%	22.2%	100.0%
		% within Gender	17.9%	5.1%	11.5%
		% of Total	9.0%	2.6%	11.5%
Total		Count	39	39	78
		% within Age	50.0%	50.0%	100.0%
		% within Gender	100.0%	100.0%	100.0%
		% of Total	50.0%	50.0%	100.0%

The ratio of males to females is 1:1 (50.0% : 50.0%).

Within the age category of 35 to 60 years, 47.6% were male. Within the category of males (only), 76.9% were between the ages of 35 to 60 years. This category of males between the ages of 35 to 60 years formed 38.5% of the total sample.

Similarly within the age category of 35 to 60 years, 52.4% were female. Within the category of females (only), 84.6% were between the ages of 35 to 60 years. This category of females between the ages of 35 to 60 formed 42.3% of the total sample.

5.2.2. Frequency in terms of experience

Figure 5-1, below indicates the duration of experience as a Lecturer.
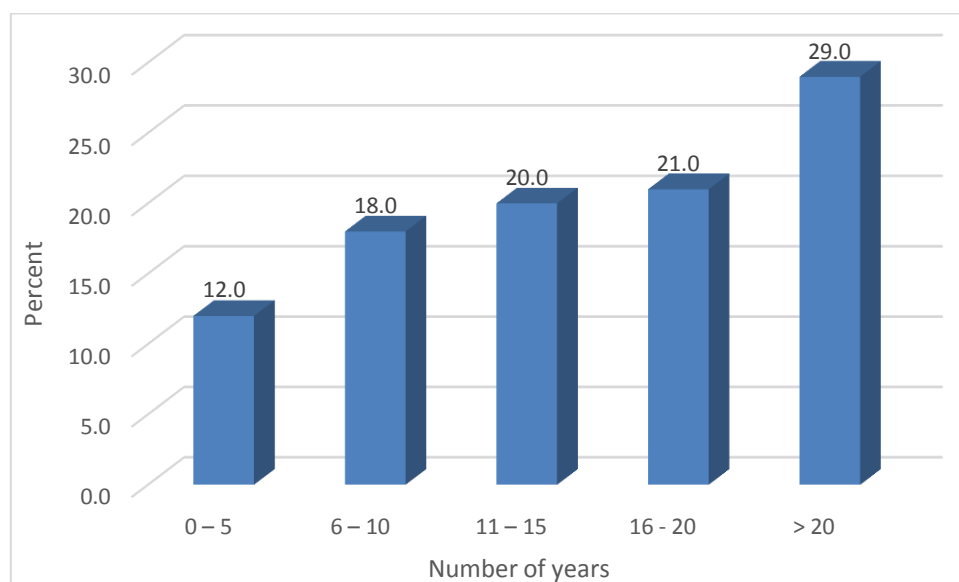
Figure 5-1: Frequency in terms of experience

Seventy percent (70.0%) of the respondents indicated that they had more than 10 years of lecturing experience. This is useful as it indicates that the responses from the participants may be considered to be given from a well-informed source, providing a reasonably accurate reflection of their experience. Furthermore, nearly 93.0% of respondents are over the age of 35 years suggesting a level of maturity in the field of teaching and learning.

5.2.3. Frequency in terms of faculty

Of all the participants that are using Blackboard the greatest percentage of respondents are from the Faculty of Arts (Table 5-1). This may be due to the fact that the school of education falls within this faculty and staff who generally lecture in this school are also teachers and they have come to realise the educational advantages of Blackboard and have thus embraced its use.

Table 5-3: Staff that have not fully embraced Blackboard

Faculty	Department	Number Of Respondents	Number Using Blackboard	Number Trained on Blackboard	Number Using Another LMS
Engineering	Civil Engineering and Surveying	2	0	0	1
	Electronic Engineering	2	0	0	0
	Mechanical Engineering	3	0	1	1
	Town and Regional Planning	2	0	0	0
	Industrial Engineering	3	0	0	3
	Electrical Power Engineering	2	0	1	2
	Chemical Engineering and Pulp & Paper Technology	1	0	0	1
	Total	15	0	2	8
Accounting & Informatics	Auditing and Taxation	6	1	4	0
	Information Technology	3	0	3	0
	Finance and Information Management (Midlands)	2	0	1	0
	Financial Accounting	2	0	2	0
	Information and Corporate Management	4	1	1	0
	Missing	1			
	Total	18	2	11	0

From Table 5-3, it can be seen that the faculty of engineering had the minimum percentage of respondents (0%) who use Blackboard. This low percentage can be attributed to the fact that more than 50% of the respondents from the Faculty of Engineering are using another LMS, which is Moodle. Furthermore out of the 50% of respondents who are not using any LMS, only 25% of these respondents have been for Blackboard training.

11.1% of all the respondents that are using Blackboard are from the Faculty of Accounting and Informatics, despite the fact that the department of Information Technology is the largest academic department within this faculty. It is expected that staff from an IT background would be inclined to use technology. What is interesting in this data is that none of the respondents from the IT department are using Blackboard or any other LMS to teach even though they have undergone Blackboard training.

5.2.4. Blackboard experience

The graph in figure 5-2 below indicates the number of years that respondents have used Blackboard.
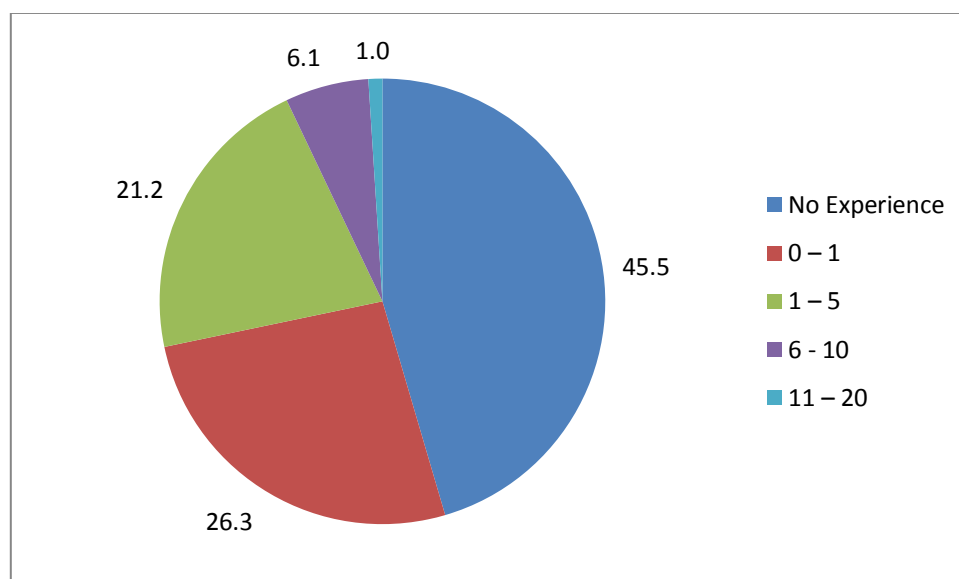
Figure 5-2: Blackboard experience

Just less than half of the number (45.5%) of respondents had not used Blackboard before. A further 26.3% had less than one year experience in the use of Blackboard. A little more than a fifth have used the medium for between 1 to 5 years. Approximately 6% had used Blackboard for more than 6 years despite the fact that Blackboard was adopted as a learning management system for more than 10 years.

5.2.5. Computer Proficiency

Table 5-4 below indicates the respondents' level of computer proficiency. As can be seen only 1% of the respondents have indicated that they have not used a computer before, while the majority (99%) of the respondents claim to be fairly competent in the use of a computer.

Table 5-4: Computer Proficiency

	Frequency	Percent
I never used a computer	1	1.0
Fairly knowledgeable	60	60.0
Very Proficient	39	39.0
Total	100	100.0

Results from a chi-square goodness of fit test show that a significant number of the respondents are fairly knowledgeable with computers ($\chi2(2$, N=100) = 53.660, p<.0005). In order to obtain a more detailed level of competency, the level of proficiency of the various application packages was determined, based on their self-appraisal.

Figure 5-3 below illustrates the level of proficiency of staff for each of the commonly used application software package:
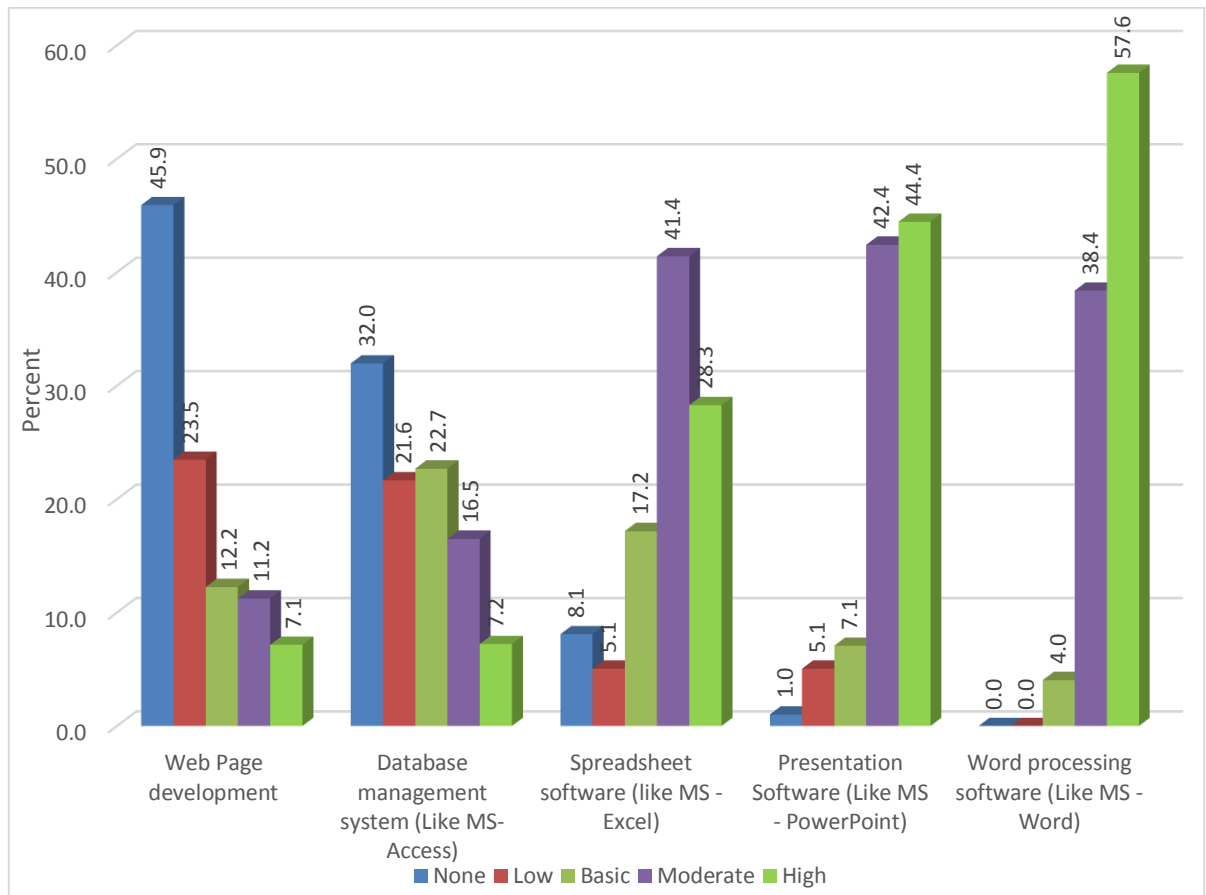
Figure 5-3: Computer applications software proficiency

It is apparent from figure 5.3 that there is a decreasing trend of proficiency from basic (such as word processing) to more complex applications (such as web page development). Only 7.1% of the respondents were comfortable with developing web pages. It is evident that most participants are proficient in word-processing and presentation software, but few are comfortable with spread-sheets, database and web page development.

5.2.6. Use of other platforms for teaching and learning

As can be seen in Table 5-5 below, close to a quarter of the respondents are using a different learning management system from Blackboard to manage their teaching and learning.

Table 5-5: Frequency of use of other LMS's

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	24	24.0	24.2	24.2
	No	75	75.0	75.8	100.0
	Total	99	99.0	100.0	
Missing	System	1	1.0		
Total		100	100.0		

Of the 24 respondents that are using other platforms for teaching and learning 10 are using an open source learning management system called Moodle. One respondent chose not to answer this question. The remaining 14 respondents who indicated that they are using another learning management system have indicated that they are using the following – incorrectly assumed examples of LMS's:

- Blogs
- MS-Powerpoint
- Turnitin
- Yahoo Groups

This certainly indicates a lack of fundamental knowledge and understanding of what LMS's are. Staff, in this instance need to be made aware of LMSs and its potential usefulness in teaching and learning.

5.2.7. Blackboard Training For Staff

Table 5-6: Blackboard training for staff

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	65	65.0	65.7	65.7
	No	34	34.0	34.3	100.0
	Total	99	99.0	100.0	
Missing	System	1	1.0		
Total		100	100.0		

Approximately two thirds of the respondents (Table 5-6) indicated that they have been for training in the use of Blackboard. Despite this training, only 19% of the respondents is using Blackboard to teach. The majority of the respondents (79%) are not using Blackboard to teach (Table 5-7). One respondent chose not to answer and is indicated as 1 missing.

Table 5-7: Use of Blackboard for teaching

			Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes		19	19.0	19.4	19.4
	No		79	79.0	80.6	100.0
	Total		98	98.0	100.0	
Missing	System		2	2.0		
Total			100	100.0		

Table 5-8 below presents the cross-tabulation between "Have you been for training to use Blackboard?" and "Are you currently using blackboard to teach?"

Table 5-8: Cross Tabulation: Training versus Use of Blackboard

			Are you currently using blackboard to teach?		Total
			Yes	No	
Have you been for training to use Blackboard?	Yes	Count	18	47	65
		% of Total	18.4%	48.0%	66.3%
	No	Count	0	33	33
		% of Total	0.0%	33.7%	33.7%
Total		Count	18	80	98
		% of Total	18.4%	81.6%	100.0%

Of the 65.0% that had received Blackboard training, only 18.4% were using it to teach. The remaining respondents did not use the platform.

Of all the respondents who have not been for training in the use of Blackboard, none of them are using Blackboard – suggesting that Blackboard training is most likely a predictor of its use. Since the competency levels of more complex applications are generally low as shown earlier, it is appropriate to conclude that it would be difficult for those participants with lower competency levels of applications to use the LMS without explicit concentrated training.

5.3. Analysis of Blackboard Users

In this section, the responses of the users of Blackboard are analysed. The Likert scale of "strongly disagree" and "disagree" were collapsed to show a single category of "Disagree". A similar procedure was followed for the levels of agreement (positive statements). This is allowed due to the acceptable levels of reliability. The results are first presented using summarised percentages for the variables that constitute each section. Results are then further analysed according to the importance of the statements.

Figure 5-4 below illustrates the cohort of 19 participants' who use Blackboard, perceptions and experiences of Blackboard usage:
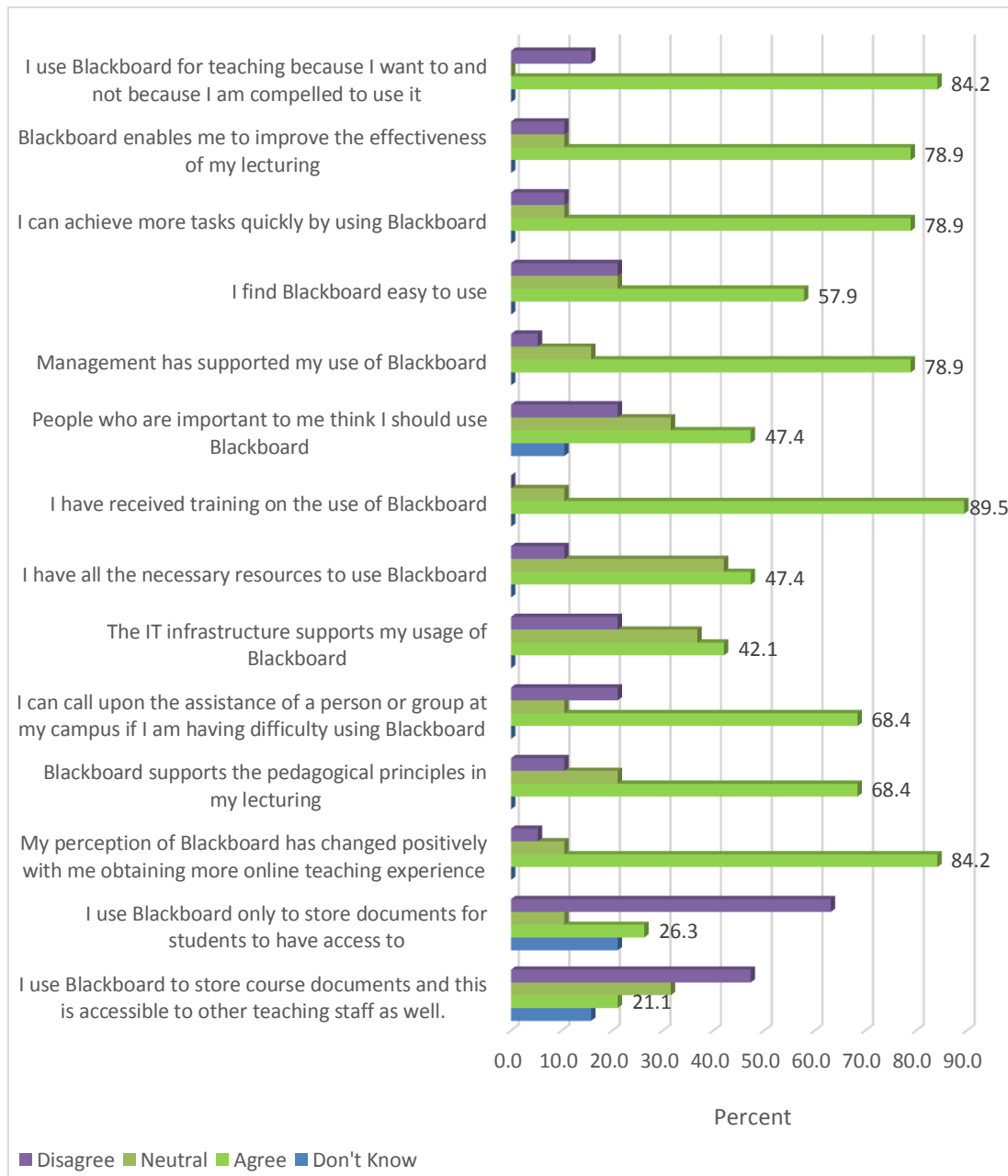
Figure 5-4: Items of measure for Blackboard usage among staff

A one sample t-test was used to test the average response score for each of the items indicated in the figure 5-4 against a neutral score of 3 to see if there was significant agreement (>3) or disagreement (<3). The results of the one sample t-test are shown in table 5-9 below:

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Table 5-9: One sample t test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
q15.1 I use Blackboard for teaching because I want to and not because I am compelled to use it	3.376	18	.003	1.000	.38	1.62
q15.2 Blackboard enables me to improve the effectiveness of my lecturing	4.846	18	.000	1.105	.63	1.58
q15.3 I can achieve more tasks quickly by using Blackboard	3.375	18	.003	.947	.36	1.54
q15.4 I find Blackboard easy to use	1.379	18	.185	.368	-.19	.93
q15.5 Management has supported my use of Blackboard	4.123	17	.001	1.000	.49	1.51
q15.6 People who are important to me think I should use Blackboard	3.052	18	.007	.947	.30	1.60
q15.7 I have rceived training on the use of Blackboard	8.945	18	.000	1.421	1.09	1.75
q15.8 I have all the necessary resources to use Blackboard	2.625	18	.017	.579	.12	1.04
q15.9 The IT infrastructure supports my usage of Blackboard	1.242	18	.230	.316	-.22	.85
q15.10 I can call upon the assistance of a person or group at my campus if I am having difficulty using Blackboard	2.477	18	.023	.684	.10	1.26
q15.11 Blackboard supports the pedagogical principles in my lecturing	3.831	18	.001	.842	.38	1.30
q15.12 My perception of Blackboard has changed positively with me obtaining more online teaching experience	5.883	18	.000	1.053	.68	1.43

As can be seen in table 5-9 above There is significant agreement that:

- Respondents use Blackboard because they want to and not because they have to (t(18) = 3.376,p=.003);
- Blackboard enables them to improve the effectiveness of their lecturing (t(18) = 4.846, p<.0005);
- Respondents can achieve more tasks quickly by using Blackboard (t(18) = 3.375, p=0.003);
- Management has supported staff use of Blackboard (t(17) = 4.123, p= 0.001)
- People who are important to the respondents think they should use Blackboard (t(18) =3.052, p=0.007).
- Respondents have received training on the use of Blackboard (t(18) = 8.945, p<0.005)
- Respondents have all the necessary resources to use Blackboard (t(18)=2.625, p=0.017).
- Staff using Blackboard can call upon the assistance of a person or group if they are having difficulty using Blackboard (t(18) = 2.477, p=0.023).
- Blackboard supports the respondents pedagogical principles in lecturing (t(18) = 3.831, p=0.001)
- Staffs' perception of Blackboard has changed with them obtaining more online teaching experience (t(18)=5.883, p< 0.005).

There is neither significant agreement nor disagreement that:

- Staff find blackboard easy to use.
- The IT infrastructure supports the respondents' usage of Blackboard.

Table 5-10 presents the four constructs from the framework used in this study (component of the UTAUT model) and the items that are used to measure the constructs.

Table 5-10: Constructs and their measurement items for staff

Construct	Measurement item
Performance Expectancy (PE)	PE1- Blackboard enables me to improve the effectiveness of my lecturing
	PE2- I can achieve more tasks quickly by using Blackboard
	PE3 - Blackboard supports the pedagogical principles in my lecturing
Effort Expectancy (EE)	EE1- I find Blackboard easy to use.
Facilitating Conditions (FC)	FC 1- Management has supported my use of Blackboard.
	FC 2- I have received training on the use of Blackboard.
	FC 3- I have all the necessary resources to use Blackboard.
	FC 4- The IT infrastructure supports my usage of Blackboard.
	FC 5- I can call upon the assistance of a person or group at my campus if I am having difficulty using Blackboard.
Social Influence (SI)	SI 1- People who are important to me think I should use Blackboard.

5.3.1. The influence of performance expectancy (PE) on staff use of Blackboard.

About 80% of the respondents that use Blackboard for their teaching feel that Blackboard will enable them to improve the effectiveness of their lecturing, however 10.5% do not feel that Blackboard will improve the effectiveness of their lecturing despite their using Blackboard for their lecturing (Fig 5-4).

About 79% of the respondents that use Blackboard feel that they can achieve more tasks quickly by using Blackboard.

68.4% of the respondents feel that Blackboard supports the pedagogical principles in their lecturing. This is probably why they are using it to teach.

A significant number of respondents are in agreement with the statements, "*Blackboard enables me to improve the effectiveness of my lecturing, I can achieve more tasks quickly by using Blackboard,* and *Blackboard supports the pedagogical principles in my lecturing"*

These statements are designed to measure performance expectancy (see figure 5.4). This agreement is indicative of their willingness to use Blackboard in their teaching.

According to the UTAUT model the gender and age variables moderates the impact of performance expectancy on behavioural intention, however, in this study, no significant relationship was found to exist between the items of measurement for performance expectancy (see table 5-10) and gender and age.

5.3.2. The influence of effort expectancy (EE) on staff use of Blackboard.

Table 5-9 indicates the result of the one sample t-test for the construct effort expectancy as $t(18) = 1.379$, $p= 0.185$. The observed difference between the agreement and disagreement in this study was not significant. Table 5-11 provides the frequencies of the Likert scale items for this construct.

Table 5-11: Ease of use of Blackboard

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.0	10.5	10.5
	Disagree	2	2.0	10.5	21.1
	Neutral	4	4.0	21.1	42.1
	Agree	9	9.0	47.4	89.5
	Strongly agree	2	2.0	10.5	100.0
	Total	19	19.0	100.0	

It is interesting to note that even though these participants are using Blackboard, the effort in using Blackboard is not overwhelmingly positive since only about 58% of the respondents agree that Blackboard is easy to use (Table 5-11). A possible explanation for this result may be the lack of adequate support.

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5.3.3. The social influences (SI) that instigate the adoption of Blackboard.

As can be seen in table 5-12 a total of about 47% of the respondents that use Blackboard have indicated that people who are important to them think that they should use blackboard. The low percentage appears to indicate that social influence is not an important factor that influences Blackboard users.

Table 5-12: People who are important to me think I should use Blackboard

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.0	5.3	5.3
	Disagree	1	1.0	5.3	10.5
	Neutral	6	6.0	31.6	42.1
	Agree	3	3.0	15.8	57.9
	Strongly agree	6	6.0	31.6	89.5
	Don't know	2	2.0	10.5	100.0
	Total	19	19.0	100.0	
Missing	System	81	81.0		
Total		100	100.0		

5.3.4. The facilitating conditions (FC) that influence the use of Blackboard

According to the UTAUT model the facilitating conditions influences usage behaviour of a system. Of the 19 respondents that are using Blackboard to teach about 89% (Table 5-13) have received training to use Blackboard.

Table 5-13: Blackboard Training

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	2	2.0	10.5	10.5
	Agree	7	7.0	36.8	47.4
	Strongly agree	10	10.0	52.6	100.0
	Total	19	19.0	100.0	
Missing	System	81	81.0		
Total		100	100.0		

The chi-square test reveals that Status was found to correlate with the item ("I have received training on the use of Blackboard"), which means that the more senior a staff member is, the more likely he would have gone for Blackboard training.

About 47% of the respondents feel that they have all the necessary resources to use Blackboard (Table 5-14). Since only 10.5% of the respondents that use Blackboard have disagreed with the statement: "I have all the resources to use Blackboard", it suggests that respondents have sufficient resources to use Blackboard.

Table 5-14: I have all the resources to use Blackboard

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	2.0	10.5	10.5
	Neutral	8	8.0	42.1	52.6
	Agree	5	5.0	26.3	78.9
	Strongly agree	4	4.0	21.1	100.0
	Total	19	19.0	100.0	
Missing	System	81	81.0		
Total		100	100.0		

Table 5-15: The IT infrastructure supports my use of Blackboard

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.0	5.3	5.3
	Disagree	3	3.0	15.8	21.1
	Neutral	7	7.0	36.8	57.9
	Agree	5	5.0	26.3	84.2
	Strongly agree	3	3.0	15.8	100.0
	Total	19	19.0	100.0	
Missing	System	81	81.0		
Total		100	100.0		

Only about 42% of the respondents that use Blackboard agree that the IT infrastructure supports their usage of Blackboard. The one sample t test in Table 5-9 above suggests that there is neither significant agreement nor disagreement that the IT infrastructure supports the respondents' use of Blackboard. It is thus likely that respondents are not entirely satisfied with the IT infrastructure at DUT and this may require further investigation.

Table 5-16: Blackboard Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.0	5.3	5.3
	Disagree	3	3.0	15.8	21.1
	Neutral	2	2.0	10.5	31.6
	Agree	8	8.0	42.1	73.7
	Strongly agree	5	5.0	26.3	100.0
	Total	19	19.0	100.0	
Missing	System	81	81.0		
Total		100	100.0		

There seems to be a reasonable amount of Blackboard support at the various campuses (Table 5-16) with about 68% reporting that they can call upon the

assistance of a person or group at their campus if they are having difficulty using Blackboard.

To determine to what extent the above 4 constructs in Table 5-10 are predictive of usage, (continued usage in this case), it was decided to construct a regression model with the four constructs as independent variables, and usage as a dependent variable.

Pearson's Correlation analysis was performed indicating that while usage is positively correlated with the four (4) constructs (PE, EE, SI and FC), it was however, not significantly correlated. However, the independent constructs were correlated with each other (some significantly) as is apparent in the table below.

Table 5-17: Correlations of the four constructs for users of Blackboard

		PEpos	EEPos	SIPos	FCPos	Usage
PEpos	Pearson Correlation	1	.731**	.364	.520*	.242
	Sig. (2-tailed)		.000	.126	.022	.317
	N	19	19	19	19	19
EEPos	Pearson Correlation	.731**	1	.597**	.549*	.253
	Sig. (2-tailed)	.000		.007	.015	.295
	N	19	19	19	19	19
SIPos	Pearson Correlation	.364	.597**	1	.476*	.257
	Sig. (2-tailed)	.126	.007		.039	.288
	N	19	19	19	19	19
FCPos	Pearson Correlation	.520*	.549*	.476*	1	.348
	Sig. (2-tailed)	.022	.015	.039		.144
	N	19	19	19	19	19
Usage	Pearson Correlation	.242	.253	.257	.348	1
	Sig. (2-tailed)	.317	.295	.288	.144	
	N	19	19	19	19	19

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

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

Facilitating conditions (FC) seemed to have strong association with effort expectancy where r = 0.549 and p=0.015< 0.05. This association may be explained in part by the fact that the effort required to use the system is strongly influenced by the conditions that prevail, such as technical, pedagogical and support from management.

Similarly facilitating conditions (FC) are strongly associated with performance expectancy (PE) where r = 0.520 and p = 0.022 < 0.05. This positive association may be due to the fact that if the facilitating conditions for using the system are in place such as, adequate training and support for using the system, then it is likely that more use of the system would result which in turn will influence the performance expectancy (PE).

Performance expectancy (PE) seems to be strongly correlated with effort expectancy where r = 0.731 and p=0.000 < 0.05. This relationship may be explained due to the fact that if one finds the system easy to use then this results in one using the system which then influences the performance expectancy (PE).

More importantly, facilitating conditions have the highest correlation with the dependent variable, usage, but is not significant. According to Pallant (2010) in order to perform a multiple regression analysis, the independent variables should correlate with each other with a correlation of not greater than 0.7 and the independent variables should correlate with the dependent variable with at least 0.3. Based on these results, it was not worthwhile to conduct a multiple regression analysis on the set of variables.

5.4. Analysis of Non Users of Blackboard

It is also necessary to ascertain the views of staff that are not using Blackboard, to obtain an understanding of the non-users' perceptions and challenges of Blackboard. Figure 5-5 shows the perceptions and experiences of Blackboard of the cohort of participants who do not use Blackboard:
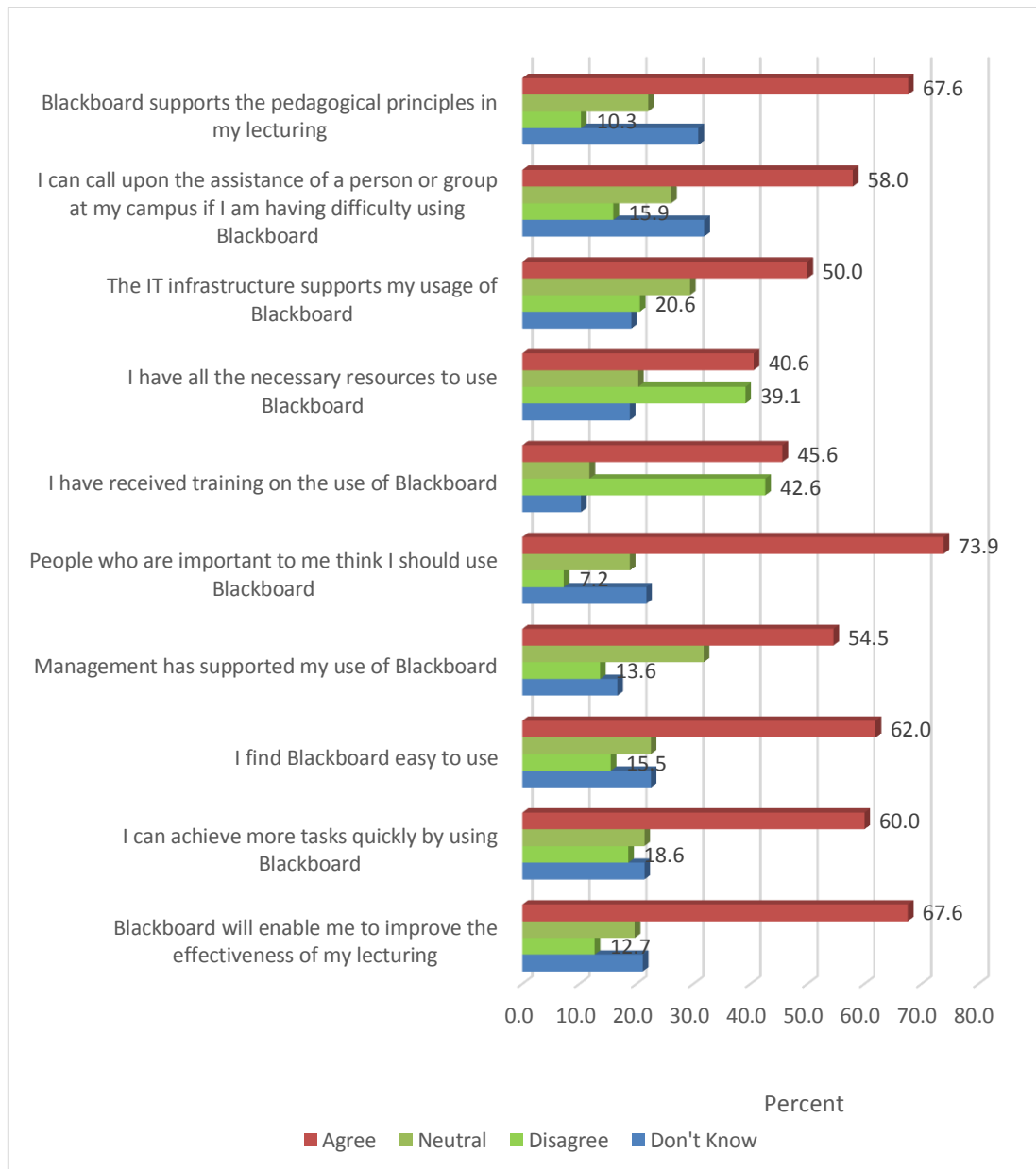
Figure 5-5: Ratings of staff perceptions of Blackboard

5.4.1. The influence of performance expectancy (PE) on intention to use Blackboard.

A significant number of staff members who are not using Blackboard have agreed with the items that measured performance expectancy which are:

- Blackboard enables me to improve the effectiveness of my lecturing.
- I can achieve more tasks quickly by using Blackboard.
- Blackboard supports the pedagogical principles in my lecturing.

The positive measured items for performance expectancy suggest that staff who are not using Blackboard perceive Blackboard to be able to assist them in their lecturing.

We can conclude that staff who are not using Blackboard in their teaching are doing so not purely for issues related to performance expectancy.

5.4.2. The influence of effort expectancy (EE) on intention to use Blackboard.

Figure 5-5 indicates that 62% of staff who do not use Blackboard perceives the use of Blackboard to be easy to use.

5.4.3. The social influences (SI) that instigate the adoption of Blackboard.

With staff who are not using Blackboard a significant number (73.9%) of them have agreed with the statement "People who are important to me think I should use Blackboard" (Fig 5-5).

It would appear that social influence would positively affect non-users intention to use Blackboard.

5.4.4. The facilitating conditions (FC) that influence the use of Blackboard

For staff who were not using Blackboard the following items were used to measure the facilitating conditions:

- Management has supported my use of Blackboard.
- I have received training on the use of Blackboard.
- I have all the necessary resources to use Blackboard.
- The IT infrastructure supports my usage of Blackboard.
- I can call upon the assistance of a person or group at my campus if I am having difficulty using Blackboard.

Only 13.6% of the respondents that are not using Blackboard felt that Management has not supported their use of Blackboard, which implies that there is fairly good Blackboard support from management.

Close to 46% of the staff that are not using Blackboard have received training on Blackboard and were in agreement with the statement: "I have received training on the use of Blackboard." However, about 43% were in dis-agreement to this statement which implies that they have not received training on Blackboard.

39.1% of the respondents felt that they do not have all the resources to use Blackboard. This is close to the number of respondents that felt they have all the resources to use Blackboard which is about 41%. The reason for the small difference could be due to the lack of resources at some campuses.

Half the number of staff that are not using Blackboard feel that the IT infrastructure supports their usage of Blackboard.

There seems to be an adequate amount of Blackboard support with 58% of the respondents agreeing with the statement: "I can call upon the assistance of a person or group at my campus if I am having difficulty using Blackboard."

5.4.5. Multiple Regression

In order to answer the last research question, to what extent do the four constructs of the PE, EE, SI and FC contribute to the variance of the criterion variable "intention to use", multiple regression was conducted.

The values for Intention to use Blackboard (IU) was coded using a Likert scale based on the comments given in the open-ended questions, where 1= No intention to use Blackboard, 2= May use Blackboard, 3= Neutral, 4= intend using Blackboard and 5= Have a strong intention to use Blackboard.

Stepwise multiple regression was then performed to assess the ability of the four constructs, performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC) to predict intention to use or adopt the learning management system, Blackboard. Table 5-18 indicates the correlation among the independent variables (PE, EE, SI, and FC) and dependent variable (IU). Note that multiple regression was set to **exclude cases listwise.** Hence, from the sample of 79, SPSS analysed the data from only 62 participants who had no missing values.

Table 5-18: Correlation among the independent and dependent variables

		IU	PE	EE	SI	FC
Pearson Correlation	IU	1.000	.255	.140	.285	.408
	PE	.255	1.000	.534	.363	.145
	EE	.140	.534	1.000	.262	.098
	SI	.285	.363	.262	1.000	.168
	FC	.408	.145	.098	.168	1.000
Sig. (1-tailed)	IU	.	.023	.139	.012	.001
	PE	.023	.	.000	.002	.131
	EE	.139	.000	.	.020	.223
	SI	.012	.002	.020	.	.095
	FC	.001	.131	.223	.095	.
N	IU	62	62	62	62	62
	PE	62	62	62	62	62
	EE	62	62	62	62	62
	SI	62	62	62	62	62
	FC	62	62	62	62	62

The final model to emerge from the Stepwise analysis contains only one predictor variable, facilitating condition (FC) in the first step.

Adjusted R square = 0.152; $F(1,60) = 11.97$, $p = 0.001$ (using the stepwise method)

Table 5-19: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
					Change Statistics				
1	.408[a]	.166	.152	1.019	.166	11.971	1	60	.001

a. Predictors: (Constant), FC

Table 5-20: Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.437	1	12.437	11.971	.001[b]
	Residual	62.337	60	1.039		
	Total	74.774	61			

a. Dependent Variable: IU

b. Predictors: (Constant), FC

Table 5-21: Coefficients

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Correlations Zero-order	Partial	Part
1	(Constant)	.583	.510		1.144	.257			
	FC	.553	.160	.408	3.460	.001	.408	.408	.408

a. Dependent Variable: IU

The three constructs, performance expectancy (PE), effort expectancy (EE) and social influence (SI) were not significant predictors in this model. In this study, the regression model accounts for only a small percentage (15%) of variance in the dependent variable (intention to use) that is the model explains 15% of the variance. The model is not significant.

5.5. Qualitative Analysis of Staff Data

This section reports on the analyses of the data obtained from interviews of selected staff members as well as the responses from the open ended question in the staff questionnaire:

> "Comment on any other factors that have not been considered above and will have an impact on the staff adoption of Blackboard"

The responses from both the staff interviews and the open ended question were categorized into various themes as follows:

Table 5-22: Themes from open ended questions and staff interviews

Theme	Related to research question
Time	What are the facilitating conditions (FC) that influence the use of Blackboard?
Ongoing Blackboard support	What are the facilitating conditions (FC) that influence the use of Blackboard?
Competency of staff and students	What are the facilitating conditions (FC) that influence the use of Blackboard?
Staff or student influence to use Blackboard	What are the social influences (SI) that instigate the adoption of Blackboard?
Blackboard facilitation of lectures	How does performance expectancy (PE) influence staff in using Blackboard?
Ease of use	How does effort expectancy (EE) influence staff use, of Blackboard?

Time

Some respondents indicated that time is a hindrance to their attending Blackboard training and also to set up an online classroom. The high workload was cited as not having sufficient time to attend the Blackboard training or teaching online using Blackboard.

Some responses from the open ended question on the questionnaire that relate to time follow:

> *"My Blackboard training was interrupted by other priorities and I have not been able to find the time to start over again."*

"My workload is just so high that I could not go for training. It is still on the, to do list."

"Most lecturers are required to spend an inordinate amount of time doing administrative work and engaging in compliance-related activities which contribute very little to truly improving the quality of education at DUT. This leaves little time for anything creative or innovative regarding academic work."

"TIME and continual CHANGE each year of COURSE/SUBJECT to lecture. Seldom lecture a course more than once then change to a new subject. very frustrating."

Some of the above issues that staff had concerning time were corroborated at the staff interviews when staff, were asked the following question: If you are not using Blackboard to teach what would you say are the reasons for this?
Some of the responses from the interviewees were as follows:

"...if I were to use Blackboard in my teaching then I will end up spending more time setting up Blackboard and responding to queries on the platform than getting my job done, which is teaching." (Interviewee 1)

"I lecture 4 subjects and I can't find the time to setup my online classrooms, since the setup of the classrooms is extremely time consuming. I think the University should decrease our workload so that we will have the time to setup our classrooms and in the process learn how to use blackboard" (Interviewee 3)

On-going Blackboard Support

At the Durban University of Technology staff are first required to attend Blackboard training before being granted permission to setup an online classroom however, there is no on-going support thereafter. This abandonment discourages staff from using

and wanting to use Blackboard. The following, excerpts from the staff interviews supports this frustration.

"I lecture at the Pietermaritzburg campus and if I encounter a problem with Blackboard there is no one I can call at the campus to quickly resolve the problem then and there, my colleagues some of whom are using Blackboard are extremely busy to help." (Interviewee 5)

"My main problem has been that the interface changes too quickly in relation to the way institutional support can adapt to these changes. After pioneers I had no adequate lab and by the time I got a lab the interface was changed to blackboard9." (Interviewee 3)

"I had an online classroom setup in the past, whenever I needed help I had to go Durban, there was no one at the Pietermaritzburg campus I could call for support as no one in my department used Blackboard, this resulted in me abandoning Blackboard" (Interviewee 2)

Competency of staff and students

For staff to adopt and use Blackboard they first need to be competent in the use of the LMS. Some staff indicated that they have no idea what Blackboard is. This is indicative of the need for staff to be educated and made aware of what a LMS such as Blackboard is all about. Other staff, have indicated, that they are using an alternate LMS and are not aware of the capabilities of Blackboard. Some of the staff responses to the open ended question are provided:

"I have no idea what Blackboard actually is."

In the same vein, some staff who indicated that they have no experience in Blackboard, but have been using Moodle, seem to be unable to transfer these skills to another LMS. This brings into play the low levels of computer competency among staff.

"I dont have experience with blackboard, but have been using moodle."

There were some staff members who felt differently towards the use of Blackboard and are surely competent in the use of the LMS as is suggestive in the excerpt below:

" Find it effective in teaching and reaching the student…."

Students also have to be competent in the use of Blackboard for staff to easily adopt the use of it in their teaching. At DUT students are not formally trained on the use of Blackboard and the lecturer is expected to train the students in using it. Given the limited amount of time and lab space the training of students by the lecturer becomes challenging. Furthermore, apart from the training of students, students need to be motivated to continually use Blackboard for it to be a success as pointed out by some respondents in answering the open ended question:

" Student incentives to motivate them to use the online class room must be put in place."

"... All students have to be trained on understanding the system. students find it difficult even with contact lectures, if staff become over dependent on this system they may become increasingly scarce. Staff may not have sufficient time to monitor progress. if it is not compulsory for students to use the facility, they will not bother. It could become a passive exercise. Blackboard is good but it must only be used as supplementary to contact lectures…"

Staff or student influence to use Blackboard

A question that was asked in the staff interviews pertaining to staff and student influence to use Blackboard is: If most other staff, in your department were using Blackboard will that influence you to use it?

Some of the excerpts in response to this question in the staff interviews were:

"Yes, I will not have much of a choice since the students will then expect me to use Blackboard as well. It will be easier to use Blackboard since the other staff in my department will support my use of Blackboard" (Interviewee 1)

"Yes, I will definitely use Blackboard because the students will expect it and it will be easier for the students to use as they will also be using the learning management system for their other subjects and will thus be familiar with the platform." (Interviewee 6)

It is clear from the above excerpts that staff, are afraid to be the only ones using Blackboard, they will adopt the use of the LMS provided that other staff also do the same. Furthermore, staff feel that if their students are also being taught on Blackboard for other subjects they are pursuing then students will be more familiar with the platform and this will play a role in them adopting the use of Blackboard in their lecturing.

Blackboard facilitation of lectures

The participants who were interviewed both those who are using Blackboard and those who are not using Blackboard to teach are in agreement that Blackboard does help to facilitate lectures and thus help the student to learn more effectively. Of particular importance as raised by one interviewee is the fact that, Blackboard can enable the process of teaching and learning to continue even during the periods of strikes and boycotts at DUT.

The excerpts in response to the questions designed to measure performance expectancy of Blackboard were:

"Blackboard is very interactive and it improves the student's concentration, especially for longer periods of time, students like the use of videos and pictures. Students are also compelled to interact on this platform to discussion posts etc." (Interviewee 2)

"Blackboard enables students to download lecture notes and also facilitates communication amongst students and between the student and the lecturer, communication is made easier." (Interviewee 1)

"The students do not have to bother the lecturer for notes all the time, all they do is go to Blackboard and download it. If students miss a lecture all they have to do is watch the relevant video on Blackboard, this is very useful especially during student strikes and boycotts" (Interviewee 4)

Ease of use

A common issue as far as the ease of use of Blackboard is concerned is when the LMS is upgraded to a later version. Many staff have, expressed their difficulty in trying to keep abreast with the later version.

"...After pioneers I had no adequate lab and by the time I got a lab the interface was changed to blackboard9. When I finished Pioneers plus (first batch), the LMS was not stable enough to finsh/finalise design. By the time the system was stable enough to design the classroom without risks of losing it, I needed a refresher for BB9.
I guess it may have been easier to keep in touch with BB if my teaching/assessment load was lesser."

One respondent who previously used Blackboard, but has since adopted the Moodle LMS indicated that Blackboard is not user friendly to staff and students.

"...Blackboard is from my experience (extremely computer literate, trained in blackboard) very prescriptive in how thing are done, hierarchically confusing in its menu choices, unfriendly to students and staff to use ..."

In the interviews, staff were asked the following question pertaining to the ease of use of Blackboard: How easy is Blackboard to use?

Some of the responses to this question from staff who are currently not using Blackboard but have attended the Blackboard training were:

> *"Blackboard is not easy to use at all, it is very confusing even to me although I have attended the Blackboard training"* (Interviewee 6)

> *"Not Easy"* (Interviewee 1)

The responses from interviewees who are currently using Blackboard in their lecturing were:

> *"It is easy to use but the change to newer versions is frustrating"* (Interviewee 5)

Staff definitely have a concern with regards to the ease of use of Blackboard since staff even after attending the training on Blackboard still find it difficult to use and some staff eventually migrate to other learning management systems.

Since staff have mentioned that Blackboard is unfriendly to students, it was imperative to also obtain the perceptions of students towards the use of Blackboard as this may help to shed some light in trying to understand the factors influencing staff adoption of the LMS.

The first three themes (Time, Ongoing Blackboard support, Competency of staff and students) that emerged from the qualitative data relate directly to the construct facilitating conditions (indicated in the quantitative data analysis). If the facilitating conditions are supportive with regard to on-going support, time out to learn or create Blackboard modules, staff would use Blackboard more readily.

5.6. Analysis of Student Data

The way students use a LMS may affect the use of the LMS by staff. Students' inability to use a LMS can influence staff not to adopt the use of a learning management system. It was also found that staff who do not use technology for

teaching perceive pressure from students as a motivating factor which can make them re-consider using technology in their teaching (Osika *et al*., 2009). It is therefore important to understand the perceptions of students towards the use of a LMS for teaching and learning since this can have a positive or negative influence on staff adoption of a LMS.

5.6.1. Frequency with respect to student level of study

The level of study of the student respondents is shown below in figure 5-6:
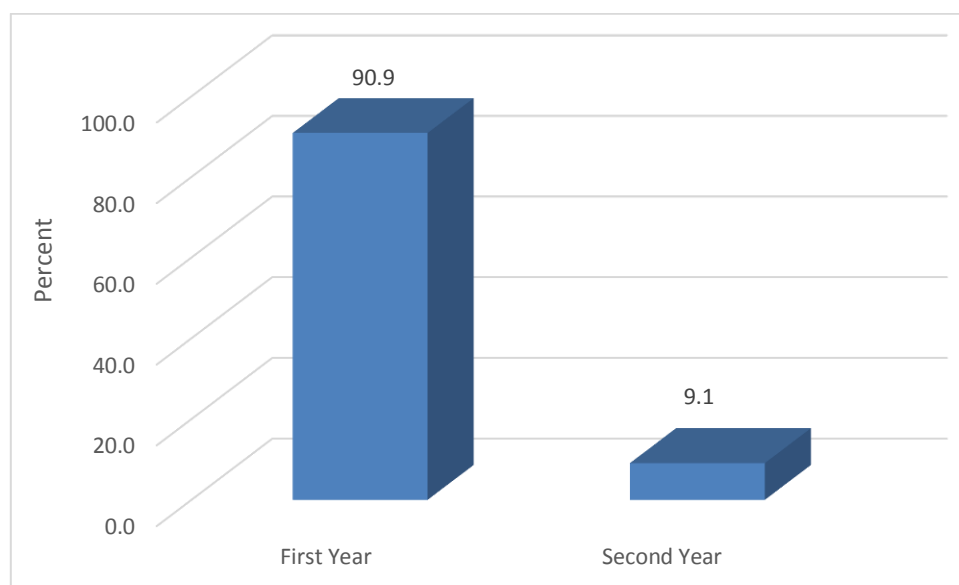
Figure 5-6: Student level of study

Nearly 91% of the respondents were first year students. This sample comprising of a majority of first year students was chosen in order to obtain their perceptions towards using Blackboard.

5.6.2. Blackboard Experience

Table 5- 23 below indicates the number of years that respondents have used Blackboard:

Table 5-23: Student blackboard experience

Number of Years' Experience	Frequency	Percent
No Experience	6	27.3
0 – 1	13	59.1
1 – 5	3	13.6
Total	22	100.0

A little more than a quarter of the respondents (27.3%) had not used Blackboard before despite the fact that a compulsory first year module was taught using Blackboard which implies that even though a module was taught using Blackboard, some students are still not using the learning management system.

A further 59.1% had less than a year experience. A little more than 13% have used the medium for between 1 to 5 years.

5.6.3. Computer Proficiency

Table 5-24 below indicates the computer proficiency of student respondents.

Table 5-24: Student computer proficiency

	Frequency	Percent
I never used a computer	6	27.3
Fairly knowledgeable	8	36.4
Very Proficient	5	22.7
Total	3	13.6

Only 27.3% have not used a computer before. Most students were of the opinion that they are fairly competent in the use of a computer. This finding is in line with the characteristics of digital natives.

5.6.4. Blackboard Access

Table 5-25 below investigates the cross-tabulation between *"How do you access Blackboard when you are not on campus?" * "The number of hours per week I spend using Blackboard"*

Table 5-25: Cross-tabulation duration on Blackboard versus means of Blackboard access

			The number of hours per week I spend using Blackboard.				Total
			Less than 1	1 - < 2	2 - < 3	3 - 4	
How do you access Blackboard when you are not on campus?	I have a computer at	Count	0	2	0	0	2
		% within The number of hours per week I spend using Blackboard.	0.0%	16.7%	0.0%	0.0%	10.0%
		% of Total	0.0%	10.0%	0.0%	0.0%	10.0%
	I use my smartphone	Count	1	6	1	2	10
		% within The number of hours per week I spend using Blackboard.	20.0%	50.0%	100.0%	100.0%	50.0%
		% of Total	5.0%	30.0%	5.0%	10.0%	50.0%
	I use a friend's computer	Count	1	2	0	0	3
		% within The number of hours per week I spend using Blackboard.	20.0%	16.7%	0.0%	0.0%	15.0%
		% of Total	5.0%	10.0%	0.0%	0.0%	15.0%
	I use an internet café	Count	3	1	0	0	4
		% within The number of hours per week I spend using Blackboard.	60.0%	8.3%	0.0%	0.0%	20.0%
		% of Total	15.0%	5.0%	0.0%	0.0%	20.0%
	Other	Count	0	1	0	0	1
		% within The number of hours per week I spend using Blackboard.	0.0%	8.3%	0.0%	0.0%	5.0%
		% of Total	0.0%	5.0%	0.0%	0.0%	5.0%
Total		Count	5	12	1	2	20
		% within The number of hours per week I spend using Blackboard.	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	25.0%	60.0%	5.0%	10.0%	100.0%

90

Only 10 % of the respondents have indicated that they have a computer at home from which to access Blackboard. What is interesting from the data, is the fact that 50% of the respondents, have indicated that they use their smartphone to access Blackboard which is suggestive of their desire to use the LMS Blackboard.

5.6.5. Students That Use Blackboard

The section that follows analyses the scoring patterns of the respondents per variable per section. Levels of disagreement (negative statements) were collapsed to show a single category of "Disagree". A similar procedure was followed for the levels of agreement (positive statements). This is allowed due to the acceptable levels of reliability.

The results are first presented using summarised percentages for the variables that constitute each section. Results are then further analysed according to the importance of the statements.

5.6.6. Use of Blackboard in Learning

This section reflects the opinions of those respondents who do use Blackboard to learn.

A cohort of 16 students indicated that they did use Blackboard. Figure 5-7 below is a summary of these responses to the various statements with regard to their interaction with Blackboard.
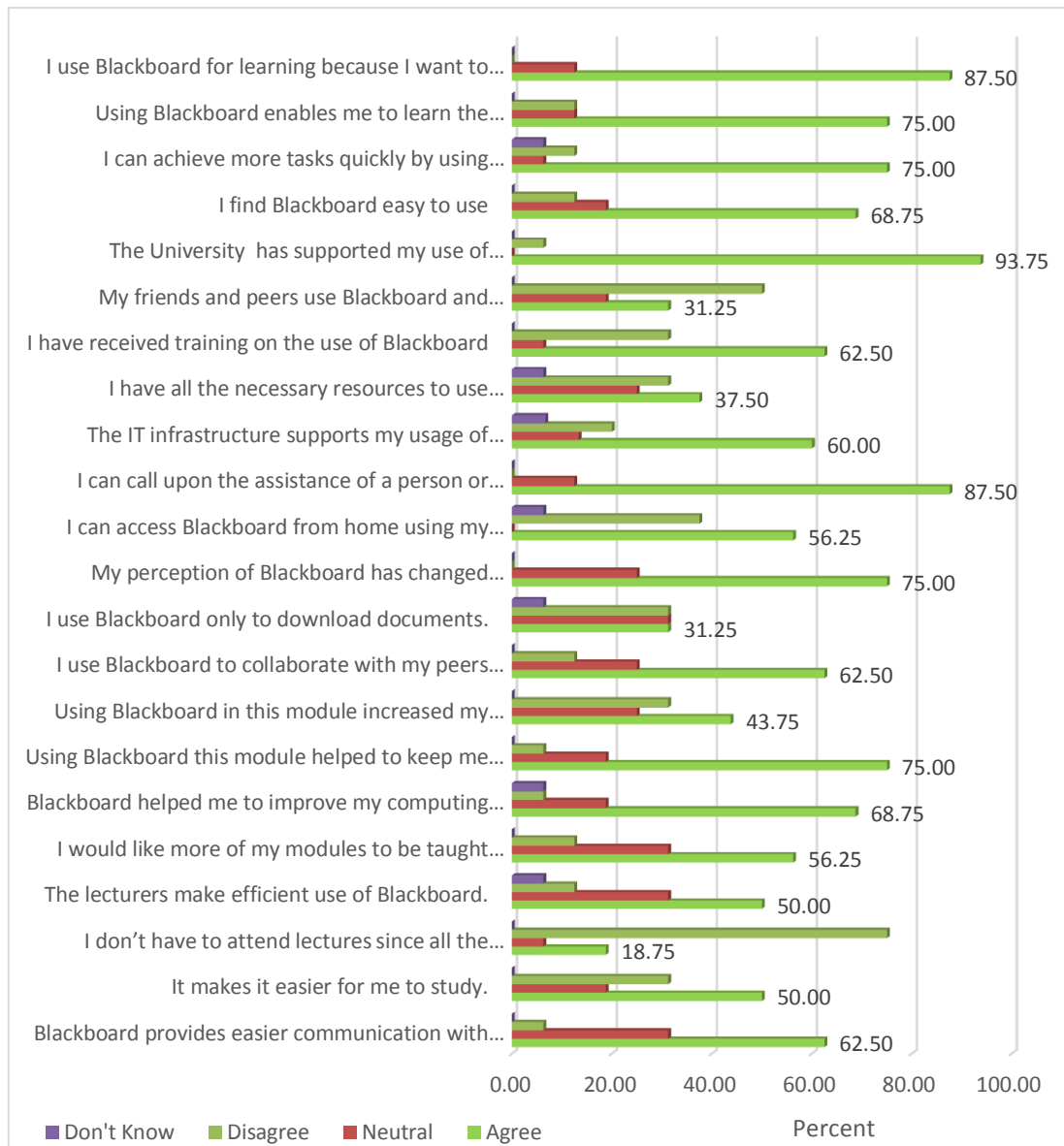
Figure 5-7: Student use of Blackboard

From Figure 5-7, it is clear that there is general agreement among the students that using Blackboard keeps students focused (75%), Blackboard provides easier communication (62%), improves their computing skills (68.75%), they are able to learn the module quicker (75%), and using Blackboard is supported by the university (93%). The most striking result to emerge from the student data is that they agreed (87.5%) that they use Blackboard because they want to, and not because they are forced to. This leaning towards the use is a positive motivation for staff to embrace the use of Blackboard. What is more interesting is that only 50% agreed that lecturers make efficient use of Blackboard, which is only a perception of students.

The variables that measure performance expectancy as well as effort expectancy, facilitating conditions and social influence of the students are indicated in table 5-26 below:

Table 5-26: Constructs and their measurement items for students

Construct	Measurement item
Performance Expectancy (PE)	PE1-Using Blackboard enables me to learn the module quicker. PE2-I can achieve more tasks quickly by using Blackboard. PE3- Using blackboard this module helped to keep me focused on this module. PE4-Blackboard helped to improve my computing skills. PE5- It makes it easier for me to study. PE6- Blackboard provides easier communication with lecturers and peers. PE 7- Blackboard provides easier communication with lecturers and peers
Effort Expectancy (EE)	EE1- I find Blackboard easy to use. EE2- Blackboard provides easier communication with lecturers and peers.
Facilitating Conditions (FC)	FC1-The University has supported my use of Blackboard. FC 2- I have received training on the use of Blackboard. FC 3- I have all the resources to use Blackboard. FC 4 - The IT infrastructure supports my usage of Blackboard. FC 5 - I can call upon the assistance of a person or group at my campus if I am having difficulty using Blackboard.
Social Influence (SI)	SI 1- My friends and peers use Blackboard and therefore I think I should use it too.

5.6.7. Influence of Performance expectancy on Student intention to use Blackboard

There is general agreement among the students that Blackboard will assist them in learning the module, about 75% felt that Blackboard will enable them to learn the module quicker, help to keep them focused on the module, and were able to achieve more tasks quickly by using Blackboard (Figure 5-7). However, only 50% of the respondents felt that Blackboard makes it easier for them to study.

5.6.8. The Influence of Effort Expectancy on Student Use of Blackboard

The variables that measure effort expectancy of the students are indicated in table 5-26 above.

As Fig 5-7 shows, there is a significant number of students (68.75%) who found Blackboard easy to use, notwithstanding the fact, that the sample only included first year students who have not previously used the learning management system Blackboard. This can be attributed to the fact that the cohort of students surveyed are digital natives and thus their familiarity with digital devices.

5.6.9. The Social Influence that Instigates the Adoption of Blackboard by Students

Social influence is measured by the following variables:

Q 15(h): My friends and peers use Blackboard and therefore, I think I should use it too.

Close to 50% of the respondents disagree with the statement that they are using Blackboard because of their friends and peers, which implies that they are using the learning management system because they want to.

5.6.10. The Facilitating Conditions that Influence the Use of Blackboard by Students.

The facilitating conditions are measured by the variables indicated in table 5-26.

The respondents felt that the facilitating conditions are conducive to them using Blackboard, however, they also felt that they do not have all the resources to use Blackboard since only 37.5% of the respondents agreed with the statement that they have all the resources to use Blackboard.

5.7. Qualitative Analysis of Student Data

This section analyses the responses from the open ended question in the student questionnaire which is:

"Comment on any other factors that have not been considered above, and will have an impact on the staff adoption of Blackboard"

The responses to the open ended question were categorised into various themes as follows:

Table 5-27: Themes from student open ended questions

Theme	Related to research question
Adequate access to Blackboard	What are the facilitating conditions (FC) that influence staff use of Blackboard?
Course facilitation	How does performance expectancy (PE) influence staff in using Blackboard?
Ease of use	How does effort expectancy (EE) influence staff use, of Blackboard?

Adequate access to Blackboard

It is important for students to be able to access the Blackboard LMS for them to fully appreciate its capabilities and the more they are exposed to the LMS the more they will find using Blackboard easier and this will therefore, result in their becoming more proficient in the use of Blackboard. According to Osika *et al.* (2009) staff become frustrated with students who cannot efficiently use an LMS and this is one of many factors that negatively influences staffs' use of the LMS.

A number of respondents indicated that they do not have adequate access to Blackboard at DUT in terms of being allowed enough time to use Blackboard on campus or at the residences. Some of their responses are as follows:

> *"We don't get enough time to use Blackboard"*

> *"I would like to access blackboard at the residences and would like to be taught to use it"*

Course facilitation

Many respondents indicated that Blackboard is useful in facilitating their course. Some respondents also mentioned that other modules should be taught online and is indicative of the fact that Blackboard is useful. The responses are as follows:

> *"Other modules should be on Blackboard as it is helpful."*

"Blackboard make things easier, more courses should be on Blackboard."

"You can print the notes from Blackboard, no need to take down notes."

The respondents also expressed their desire to have other modules they are pursuing to be online as well. This desire by the students can, in the future, become a motivating factor to encourage other staff who are not using Blackboard to move their courses online since research conducted by Osika *et al.* (2009) has revealed that pressure from students can positively influence staff to adopt new technology.

Ease of use

Respondents feel that Blackboard is easy to use as indicated by the following excerpt:

"Blackboard make things easier, more courses should be on Blackboard."

5.8. Conclusion

This chapter discussed the quantitative as well as the qualitative results of the study that was conducted on the academic staff and students at Durban University of Technology. The results are presented using cross tabulations, figures and graphs. Based on the results and analysis, a summary with recommendations is provided in chapter 6. An overview of the study is also provided.

CHAPTER 6 : CONCLUSION

6.1. Introduction

This chapter presents an overview of the study conducted together with conclusions drawn from the findings of the research as well as suggestions for future research.

6.2. Objectives of the Study

The main objectives of the study as mentioned in chapter one are:

- To understand how performance expectancy and effort expectancy influence staff in using Blackboard.
- To determine the social influences that instigate the adoption of Blackboard.
- To determine the facilitating conditions that instigate the use of Blackboard.
- To determine to what extent the constructs contribute separately and together in the adoption of Blackboard.

6.3. Findings and Discussions

Performance Expectancy

Both users and non-users (staff) of Blackboard agree that:

- Blackboard enables them to improve the effectiveness of their lecturing.
- They can achieve more tasks quickly by using Blackboard.
- Blackboard supports the pedagogical principles in their lecturing.

This means the staff, who are not using Blackboard are not doing so purely for issues related to performance expectancy, but for other reasons.

Effort Expectancy

There was neither agreement nor disagreement with the users of Blackboard that it was easy to use however, a significant percentage of non-users of Blackboard perceive it to be easy to use. It must also be noted that even though the non-users of Blackboard are currently not using the LMS, a significant number of these staff members have either attended the Blackboard training or who have migrated to using an alternate LMS and thus, are familiar with the Blackboard platform.

The constant upgrades to Blackboard is a possible reason as to why some staff have found Blackboard not easy to use as was revealed in the qualitative analysis of staff data. Staff felt that it was difficult to keep abreast with the changes when the LMS is upgraded. More training, especially when the LMS is upgraded, can help to alleviate this problem.

The qualitative analysis of staff data revealed that some staff found Blackboard difficult to use and not user friendly and thus they have adopted an alternate LMS. This indicates the ease of use of Blackboard is an issue that needs to be addressed. More staff training as well as refresher courses for staff after they have attended training will help to improve the ease of use of Blackboard.

Social Influence

With the users of blackboard, there was significant agreement that they are using Blackboard because of social influence however, this was not the case with staff who are not using Blackboard. Negative social influence was not a reason for them not wanting to use Blackboard in their teaching.

Facilitating Conditions

Blackboard training was found to be a predictor of its use by staff members, since, of all the respondents who have not been for Blackboard training, none of them are using Blackboard to teach. However, it was found that a significant percentage of staff members who have been for Blackboard training have not adopted its use for teaching and learning; this could suggest a need for a refresher course on Blackboard or it could more seriously imply that the training that staff members received was not adequate enough to enable the staff members to set up their online classrooms and teach online.

The users of Blackboard felt that there seems to be adequate support with regards to Blackboard training, resources to use blackboard, support from management and onsite Blackboard support, however, there was neither agreement nor disagreement that the IT infrastructure supports the respondents' usage of Blackboard.

A significant number of non-users of Blackboard felt that they do not have all the resources to use blackboard and that the IT infrastructure do not support their usage of Blackboard. This could explain why these staff members are reluctant to use Blackboard and suggests that the institution must put in support programmes to adequately equip staff with the necessary resources to be able to effectively use Blackboard.

To what extent does each of the constructs affect the use of Blackboard

The four constructs which were the independent variables used in this study are:

- Performance Expectancy (PE)
- Effort Expectancy (EE)
- Social Influence (SI)
- Facilitating Conditions (FC)

The study has shown that these constructs (PE, EE, SI and FC) were not significant predictors of Blackboard usage. However, the independent constructs were correlated with each other (some significantly) as is apparent in the table 5-17.

The study has shown that Facilitating conditions (FC) seemed to have strong association with effort expectancy. This association may be explained in part by the fact that effort required to use the system is strongly influenced by the conditions that prevails, such as support from management.

Similarly facilitating conditions (FC) were also strongly associated with performance expectancy (PE). An explanation for this positive association may be due to the fact that if the facilitating conditions for using the system are all in place, such as adequate training and support for using the system, then it would suggest that the result thereof is more usage of the system which in turn leads to the system assisting one in one's job.

Performance expectancy (PE) seems to be strongly correlated with effort expectancy. This relationship may be explained due to the fact that if one finds the system easy to use then this results in one using the system which then assists one in doing one's job.

More importantly facilitating conditions were found to have the highest correlation with the dependent variable, usage, but this was not significant.

Student use of Blackboard

The student respondents seem to be content with the use of Blackboard. They felt that Blackboard will assist them in learning the module quicker, help to keep them focused on the module, and they were able to achieve more tasks quickly by using Blackboard.

A significant number of students also felt that Blackboard is easy to use and are using Blackboard because they want to and not due to social influence.

Students felt that the facilitating conditions are conducive to them using Blackboard, however, they do not have all the resources to use Blackboard effectively. A significant percentage of the students have indicated that they access the Blackboard LMS via their smartphone which means that they do not have access to a computer to use Blackboard when not on campus or in residence. Making computers connected to the internet available to use at the residence will help to address the problem of inadequate access that students face after hours.

Blackboard training of students

Close to 63% of the students have agreed that they have received Blackboard training, however, this training was conducted by the academic staff responsible for teaching online and no explicit Blackboard training was provided by the institution for students to effectively use Blackboard.

Academic staff teaching online, are expected to teach the students how to use Blackboard, which is usually done in the first few lectures of the semester. Furthermore, if the subject being taught is a non IT related subject, then it is not allocated computer lab time which compounds the problem of training students on Blackboard usage. Thus having a programme to teach students how to use Blackboard at the beginning of the semester or year can help to alleviate the problem that academic staff face in training students to use Blackboard. The training of

students by academic staff on how to use Blackboard can be an inhibitor to staff adopting the use of Blackboard.

6.4. Suggestions for Future Research

The following are recommendations for future research:

Usability of Blackboard

The study has revealed that a large percentage of staff respondents who have undergone Blackboard training are currently not using the LMS for teaching and learning. Some staff who have been for Blackboard training have also subsequently migrated to an alternate LMS and indicated that Blackboard is not user friendly and difficult to use. Thus it will be interesting to research the usability of Blackboard since this could be a reason as to why some staff have migrated to an alternate LMS like Moodle.

Adequacy of Blackboard training

As mentioned earlier a significant number of staff members at DUT who have been for Blackboard training are not using the LMS, further research also needs to be conducted as to the effectiveness of the training received with the aim of getting staff to setup their online classrooms soon after they attend the Blackboard training sessions. On-going support is necessary.

Use of smartphones by students

In the study conducted, 50% of the student respondents accessed Blackboard via their smartphones when not on campus. This is expected since the current cohort of students are regarded as digital natives, and thus they are more comfortable using mobile and other digital devices. Research needs to be carried out to determine how smartphones and other mobile devices can be effectively used for teaching and learning at DUT.

Programmes to train students on Blackboard

There is currently no formal training for students to learn how to use Blackboard at DUT. Academic staff teaching online, are expected to teach the students how to use

Blackboard, which is usually done in the first few lectures of the semester. Furthermore, if the subject being taught is a non IT related subject then it is not allocated lab time which compounds the problem of training students on Blackboard usage. Thus, having a programme to teach students how to use Blackboard at the beginning of the semester or year can help to alleviate the problem that academic staff face in training students to use Blackboard.

6.5. Limitations of the study

The following are some limitations of the study conducted:

- The study was conducted on a single case of a Learning Management System which is Blackboard, the findings are thus not generalizable to other LMSs.
- The research was conducted using subjects only from Durban University of Technology. Hence the research findings may not necessarily apply to other institutions.
- Only academic staff members and students were included in the study therefore, the findings cannot be applied to non-academic staff in other departments at the institution.
- The usage of Blackboard at DUT is completely voluntary therefore the factors that influence staff to adopt or reject an LMS might be beyond those revealed by this study.

6.6. Conclusion

The study identified factors that influence the adoption of Blackboard by academic staff at DUT by considering various dimensions, including the constructs from the UTAUT model – performance expectancy, effort expectancy, social influence and facilitating conditions. One of the more significant findings to emerge from this study is that facilitating conditions need to be addressed for the successful adoption and use of Blackboard. Time to learn, set up and continual support during the use of Blackboard emerged as key findings. Academic staff – both users and non-users of Blackboard –and students were found to be in agreement that Blackboard will enable

them to improve their teaching and learning. It is therefore vital that a concerted effort is required in supporting academic staff to use the LMS Blackboard.

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STAFF QUESTIONNAIRE

TITLE: FACTORS AFFECTING STAFF ADOPTION OF BLACKBOARD AMONG DURBAN UNIVERSITY OF TECHNOLOGY ACADEMICS.

SECTION A: BACKGROUND

Dear Respondents

This survey aims to determine your interaction or non – interaction with a learning management system (LMS) such as Blackboard with a view to improving and / or designing a developmental workshop which will assist you in your teaching. The information you provide will help us better understand the quality of your Blackboard experience and hence better equip you if necessary in using the system.

We request you to respond to the questions frankly and honestly. Your response will be kept strictly confidential.

Thank you for your time and cooperation.

SECTION B: GENERAL QUESTIONS

1. Gender

   Male ☐   Female   ☐

2. Age

   18 – 24   ☐

   25 – 34   ☐

   35 – 60   ☐

Above 60 ☐

3. Status

Junior Lecturer ☐

Lecturer ☐

Senior Lecturer ☐

Professor / ☐
Associate Professor

4. Campus

Steve Biko ☐   ML Sultan ☐   Ritson Rd. ☐   City ☐

campus

Riverside ☐   Ndumiso ☐

5. Faculty

Engineering ☐   Arts ☐   Management Sciences. ☐

Accounting & Informatics ☐   Health Sciences ☐

Applied Sciences ☐

6. Which department do you work in?

_____

7. Number of years of experience as a lecturer

0 – 5 Yrs ☐

6 – 10 yrs ☐

11 – 15 yrs ☐

16 – 20 yrs ☐

>20yrs ☐

8. Number of years of experience using Blackboard

No Experience ☐

0 – 1 Yrs ☐

1 – 5 yrs ☐

6 – 10 yrs ☐

11 – 20 yrs ☐

>20yrs ☐

9. How will you rate your computer proficiency?

I never used a computer ☐

I am a beginner ☐

Fairly knowledgeable ☐

Very Proficient ☐

10. How will you rate your level of proficiency as far as the use of the

following:

	None	Low	Basic	Moderate	High
Word Processing Software (Like MS – Word)					
Spreadsheet Software (like MS-Excel)					
Database Management System (Like MS-Access)					
Presentation Software (Like MS – Powerpoint)					
Web page development					
Podcasting					

11. What Percentage of the subjects you lecture are taught using

   Blackboard?

   0 %   ☐

   0 - 20   ☐

   21- 40   ☐

   41– 60   ☐

   61– 80   ☐

81 - 100 ☐

11. Are you currently using any other Learning Management System apart from Blackboard?

Yes ☐ No ☐

12. If your answer to 11 is yes, which LMS are you using?_____

13. Have you been for training to use Blackboard?

Yes ☐ No ☐

14. Are you currently using Blackboard to teach?

Yes ☐ No ☐

SECTION C:

15. ANSWER THE FOLLOWING QUESTIONS ONLY IF YOU ARE USING BLACKBOARD TO TEACH.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know
15.1 I use Blackboard for teaching because I want to and not because I am compelled to use it						
15.2 Blackboard enables me to improve the effectiveness of my lecturing						
15.3 I can achieve more tasks quickly by using Blackboard						
15.4 I find Blackboard easy to use						
15.5 Management has supported my use of Blackboard						
15.6 People who are important to me think I should use Blackboard						
15.7 I have received training on the use of Blackboard						
15.8 I have all the necessary resources to use Blackboard						
15.9 The IT infrastructure supports my usage of Blackboard						
15.10 I can call upon the assistance of a person or group at my campus if I am having difficulty using Blackboard.						

15.11 Blackboard supports the pedagogical principles in my lecturing.						
15.12 My perception of Blackboard has changed positively with me obtaining more online teaching experience						
15.13 I use Blackboard only to store documents for students to have access to.						
15.14 I use Blackboard to store course documents and this is accessible to other teaching staff as well.						

SECTION D

ANSWER THE FOLLOWING QUESTIONS ONLY IF YOU ARE USING BLACKBOARD TO TEACH.

16. How often do you make use of the following course tools for the modules you teach online?

Course Tool	Always	Often	Fairly Often	Occasionally
16.1 Course Documents				
16.2 Announcements				
16.3 Assignments				
16.4 Digital Drop Box				
16.5 External Links				
16.6 Instructor Tools				
16.7 Discussion board				
16.8 Grade Book				
16.9 Staff information				
16.10 Course information				
16.11 Virtual Classroom				
16.12 Email				
16.13 Blogs				
16.14 Wikis				
16.15 Podcasting				

16.16 Glossary Manager				
16.17 Survey Tool				
16.18 Test Tool				
16.19 Student Access Statistics				

17. Rate the overall effectiveness of each tool / component within Blackboard.

Course Tool	Very Effective	Somewhat effective	Cannot decide	Somewhat Ineffective	Very Ineffective
17.1 Course Documents					
17.2 Announcements					
17.3 Assignments					
17.4 Digital Drop Box					
17.5 External Links					
17.6 Instructor Tools					
17.7 Discussion board					
17.8 Grade Book					
17.9 Staff information					
17.10 Course information					
17.11 Virtual Classroom					
17.12 Email					
17.13 Blogs					
17.14 Wikis					
17.15 Podcasting					
17.16 Glossary Manager					

17.17 Survey Tool						
17.18 Test Tool						
17.19 Student Access Statistics						

SECTION E

ONLY ANSWER THE QUESTIONS INTHIS SECTION IF YOU ARE NOT

USING BLACKBOARD IN YOUR TEACHING

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know
18.1 Blackboard will not enable me to improve the effectiveness of my lecturing						
18.2 I cannot achieve more tasks quickly by using Blackboard						
18.3 I do not find Blackboard easy to use						
18.4 Management has not supported my use of Blackboard						
18.5 People who are important to me think I should not use						

Blackboard						
18.6 I have received training on the use of Blackboard						
18.7 I do not have all the necessary resources to use Blackboard						
18.8 The IT infrastructure do not support my usage of Blackboard						
18.9 I cannot call upon the assistance of a person or group at my campus if I am having difficulty using Blackboard.						
18.10 Blackboard does not support the pedagogical principles in my lecturing.						

19. Comment on any other factors that, have not been considered above and will have an impact on the staff adoption of Blackboard.

_____
_____
_____
_____
_____

STUDENT QUESTIONNAIRE

TITLE: FACTORS AFFECTING STAFF ADOPTION OF BLACKBOARD AMONG DURBAN UNIVERSITY OF TECHNOLOGY ACADEMICS.

SECTION A: BACKGROUND

Dear Student

This survey aims to determine your interaction or non – interaction with a learning management system (LMS) such as Blackboard with a view to improving and / or designing a developmental workshop which will assist you in your studies. The information you provide will help us better understand the quality of your Blackboard experience and hence better equip you if necessary in using the system.

We request you to respond to the questions frankly and honestly. Your response will be kept strictly confidential.

SECTION B: GENERAL QUESTIONS

1. Gender

   Male ☐   Female ☐

2. Age

   16 – 19   ☐

   20 – 25   ☐

   26 – 30   ☐

   Above 30 ☐

3. Status

First Year ☐

2nd Year ☐

3rd Year ☐

Post Graduate ☐

4. Campus

Steve Biko ☐   ML Sultan ☐   Ritson Rd. ☐   City ☐

campus

Riverside ☐   Ndumiso ☐

5. Faculty

Engineering ☐   Arts ☐   Management Sciences. ☐

Accounting & Informatics ☐   Health Sciences ☐

Applied Sciences ☐

6. What qualification are you studying towards? _____

7. Which department are you a student in?_____

8. Number of years of experience using Blackboard

No Experience ☐

0 – 1 Yrs ☐

1 – 5 yrs ☐

7 – 10 yrs ☐

11 – 20 yrs ☐

>20yrs ☐

9. How do you access Blackboard when you are not on campus?

I have a computer at home or place of residence ☐

I use my smartphone ☐

I use a friend's computer ☐

I use an internet café ☐

I use a computer at work ☐

Other (Please state)_____

10. The number of hours per week I spend using Blackboard.

Less than 1 ☐

1 – 2 ☐

2 - 3 ☐

3 – 4 ☐

5 – 6 ☐

> 6 ☐

18. Number of years you have been using a computer.

I never used a computer ☐

0 – 1 year ☐

1 – 3 years ☐

> 3 Years ☐

12. How will you rate your level of proficiency as far as the use of the

following:

	None	Low	Basic	Moderate	High
Word Processing Software (Like MS – Word)					
Spreadsheet Software (like MS-Excel)					
Database Management System (Like MS-Access)					
Presentation Software (Like MS – Powerpoint)					
Web page development					
Podcasting					

13. Have you been taught by your lecturer to use Blackboard?

Yes ☐   No ☐

14.   Are you currently using Blackboard to learn?

Yes ☐   No ☐

SECTION C:

15.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know
a) I use Blackboard for learning because I want to and not because I am compelled to use it						
b) Using Blackboard enables me to learn the module quicker.						
c) I can achieve more tasks quickly by using d) Blackboard						
e) I find Blackboard easy to use						
f) The University has supported my use of g) Blackboard						
h) My friends and peers use Blackboard and therefore I think I should use it too.						
i) I have received training on the use of Blackboard						
j) I have all the necessary resources to use Blackboard						
k) The IT infrastructure supports my usage of Blackboard						
l) I can call upon the assistance of a person or group at my campus if I am having difficulty using Blackboard.						

m)	I can access Blackboard from home using my computer.						
n)	My perception of Blackboard has changed positively with me obtaining more online experience						
o)	I use Blackboard only to download documents.						
p)	I use Blackboard to collaborate with my peers and this helps me with learning the module.						
q)	Using Blackboard in this module increased my workload.						
r)	Using Blackboard this module helped to keep me focused on this module.						
s)	Blackboard helped me to improve my computing skills.						
t)	I would like more of my modules to be taught using Blackboard.						
u)	The lecturers make efficient use of Blackboard.						
v)	I don't have to attend lectures since all the material are on Blackboard						
w)	It makes it easier for me to study.						
x)	Blackboard provides easier communication with lecturers and peers.						

SECTION D

16. How often do you make use of the following course tools for the
    modules you are taught online?

Course Tool	Always	Often	Fairly Often	Occasionally
a) Course Documents				
b) Announcements				
c) Assignments				
d) Digital Drop Box				
e) External Links				
f) Discussion board				
g) Grade Book				
h) Course information				
i) Virtual Classroom				
j) Email				
k) Blogs				
l) Wikis				
m) Podcasting				
n) Glossary Manager				
o) Survey Tool				
p) Test Tool				

17. Rate the overall effectiveness of each tool / component within

Blackboard.

Course Tool	Very Effective	Somewhat effective	Cannot decide	Somewhat Ineffective	Very Ineffective
a) Course Documents					
b) Announcements					
c) Assignments					
d) Digital Drop Box					
e) External Links					
f) Discussion board					
g) Grade Book					
h) Course information					
i) Virtual Classroom					
j) Email					
k) Blogs					
l) Wikis					
m) Podcasting					
n) Glossary Manager					
o) Survey Tool					
p) Test Tool					

18. Comment on any other factors that, have not been considered above and will have an impact on the staff adoption of Blackboard.

_____

_____

_____

_____

_____

_____

_____

_____

_____

ANNEXURE C: STAFF INTERVIEW QUESTIONNAIRE

STAFF INTERVIEW QUESTIONNAIRE

TITLE: FACTORS AFFECTING STAFF ADOPTION OF BLACKBOARD AMONG DURBAN UNIVERSITY OF TECHNOLOGY ACADEMICS.

SECTION A: BACKGROUND

This study aims to investigate the perceptions of staff towards the use of Blackboard for teaching and learning so as to understand the reasons for the slow adoption of Blackboard by staff.

The research intends to investigate:
- The perceptions of staff towards the use of blackboard for teaching and learning
- The level of the usage of Blackboard at the University.

The research will be guided by the following research questions:
- What are the perceptions of the staff towards the use of Blackboard?
- What are the factors that influence the use of the LMS Blackboard?
- Why do they have these perceptions?
- How can staff be encouraged to adopt the LMS in their teaching?

SECTION B: GENERAL QUESTIONS

1. Gender

   Male ☐   Female   ☐

2. Age

   18 – 24   ☐

   25 – 34   ☐

35 – 60 ☐

Above 60 ☐

3. Status

Junior Lecturer ☐

Lecturer ☐

Senior Lecturer ☐

Professor / Associate Professor ☐

4. Campus

Steve Biko ☐　　ML Sultan ☐　　Ritson Rd. ☐　City ☐

campus

Riverside ☐　　Ndumiso ☐

5. Faculty

Engineering ☐　Arts ☐　Management Sciences. ☐

Accounting & Informatics ☐　　Health Sciences ☐

Applied Sciences ☐

6. Which department do you work

in?_____

7. Number of years of experience as a lecturer at DUT.

0 – 5 Yrs ☐

6 – 10 yrs ☐

11 – 15 yrs ☐

17 – 20 yrs ☐

>20yrs ☐

8. Number of years of experience using Blackboard

    No Experience   ☐

    0 – 1 Yrs   ☐

    1 – 5 yrs   ☐

    6   – 10 yrs   ☐

    11 – 20 yrs   ☐

      >20yrs   ☐

9. How will you rate your computer proficiency?

    I never used a computer   ☐

    I am a beginner   ☐

    Fairly knowledgeable   ☐

    Very Proficient   ☐

10. What Percentage of the subjects you lecture are on Blackboard?

    0 %   ☐

    1   - 20   ☐

    21- 40   ☐

    41– 60   ☐

    61– 80   ☐

    81 - 100   ☐

19. Are you currently using any other Learning Management System apart

    from Blackboard?

Yes ☐ No ☐

20. If your answer to 11 is yes, which LMS are you

using?_____

21. Have you been for training to use Blackboard?

Yes ☐ No ☐

22. Are you currently using Blackboard to teach?

Yes ☐ No ☐

SECTION C:

ANSWER THE FOLLOWING QUESTIONS ONLY IF YOU ARE USING

BLACKBOARD TO TEACH.

23. What number of modules that you lecture are done using Blackboard?

24. How easy is Blackboard to use?

25. Explain how the students benefit from the use of Blackboard.

26. What resources do you still require to use Blackboard?

27. What support do you receive from management as far as the use of

Blackboard is concerned?

28. What are some of the difficulties you experienced while using

Blackboard?

29. Are you using Blackboard primarily as a repository?

30. If your answer to question 21 is no then how are you using it

to assist in your lecturing?

31. What tools of blackboard are you using in your teaching?

32. Explain which tools in question 23 you find more effective?

SECTION E

ONLY ANSWER THE QUESTIONS INTHIS SECTION IF YOU HAVE BEEN

FOR TRAINING ON BLACKBOARD BUT ARE NOT USING

BLACKBOARD IN YOUR TEACHING

33. If you are not using Blackboard to teach what would you say is the reason for this?

34. What resources do you still require to use Blackboard?

35. How easy is Blackboard to use?

36. What percentage of the staff in your department, are using Blackboard?

37. If most other staff in your department were using Blackboard will that influence you to use it?

38. Explain how the students benefit from the use of Blackboard.

39. Explain how easier or difficult will the use of Blackboard make your job as a lecturer.

40. What support do you think DUT must provide in order for you to make use of Blackboard?

SECTION F

ONLY ANSWER THIS SECTION IF YOU HAVE NOT BEEN FOR TRAINING ON BLACKBOARD AND YOU ARE THUS NOT USING BLACKBOARD.

41. What would you say are the reasons for not going for training on Blackboard?

42. Explain how easy or difficult will the use of Blackboard make your job as a lecturer.

43. What percentage of the staff in your department, are using Blackboard?

44. Explain how you think students may benefit from the use of Blackboard in your teaching?

45. Explain how you think you may benefit from the use of Blackboard in your teaching?

46. What support do you think DUT must provide in order for you to make use of Blackboard?

47. How satisfied are you with your current teaching methods?

48. Are you not using Blackboard because important others think that you should not?

49. If your answer to question 40 is yes, please explain.

50. What do you think you require in order to, make use of Blackboard in your lecturing

ANNEXURE D: PERMISSION TO UNDERTAKE RESEARCH AT DURBAN UNIVERSITY OF TECHNOLOGY

**D U R B A N
UNIVERSITY *of*
TECHNOLOGY**

9 November 2012

University Of Kwazulu Natal

Ethics Committee

R.E. SUPPORT TO UNDERTAKE RESEARCH ON CAMPUS — D. MOONSAMY

I hereby support Mr D. Moonsamy (Student Number: 9041243) who is registered for a MCom (Information Systems) to undertake research at Durban University Of Technology. His topic "Factors affecting staff adoption of Blackboard amongst DUT academics" is of interest to the department.

Thanking You

Mrs TF Thompson

(Acting HOD: Finance & Information Management)

ANNEXURE E: INFORMED CONSENT FORM TO PARTICIPANTS

UNIVERSITY OF KWAZULU-NATAL
SCHOOL OF MANAGEMENT, IT AND GOVERNANCE

Dear Respondent,

MCom (Information Systems) Research Project
Researcher: D. Moonsamy (0837856486)
Supervisor: Dr I Govender(0312603485)

I, **Devraj Moonsamy** an **MCom (Information Systems)** student, at the **SCHOOL OF MANAGEMENT, IT AND GOVERNANCE**, of the University of Kwazulu Natal. You are invited to participate in a research project entitled **Factors affecting staff adoption of Blackboard among Durban University of Technology academics.** The aim of this study is to: identify factors that may be preventing staff from adopting the use of Blackboard.

Through your participation I hope to understand **the perceptions that staff at DUT has towards the use of Blackboard for teaching and learning**. I also hope to understand the level of usage of Blackboard at DUT. The results of the survey are intended to contribute to the development of support programmes to assist staff overcome barriers in using Blackboard.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this survey. Confidentiality and anonymity of records identifying you as a participant will be maintained by the **SCHOOL OF MANAGEMENT, IT AND GOVERNANCE**, UKZN.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me or my supervisor at the numbers listed above.

The survey should take you about **10** minutes to complete. I hope you will take the time to complete this survey.

Sincerely

Investigator's   signature_____
Date_____

_____

ANNEXURE F: CONSENT FORM OF PARTICIPANT

On separate page

CONSENT

I……………………………………………………………………….(full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT   DATE

…………………………………………………………………………………

ANNEXURE G: ETHICAL CLEARANCE LETTER

UNIVERSITY OF ™
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI

11 December 2012

Mr Devraj Moonsamy 9041243
School of Management, IT and Governance
Westville Campus

Dear Mr Moonsamy

Protocol reference number: HSS/1314/012M
Project title: Factors affecting staff adoption of Blackboard among Durban University of Technology academics

EXPEDITED APPROVAL

I wish to inform you that your application has been granted Full Approval through an expedited review process.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. Please note: Research data should be securely stored in the school/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Professor Steven Collings (Chair)

/pm

cc Supervisor: Dr I Govender
cc Academic leader: Professor KK Govender
cc School Admin.: Ms Hlengiwe Ngcobo

INSPIRING GREATNESS

UNIVERSITY OF ™
KWAZULU-NATAL

INYUVESI
YAKWAZULU-NATALI

18 February 2016

Mr D Moonsamy 9041243
School of Management, IT and Governance
Westville Campus

Dear Mr Moonsamy

Protocol reference number: HSS/1314/012M
New project title: Staff perceptions and use of Blackboard at Durban University of Technology

Approval notification – Amendment Application

This letter serves to notify you that your application for an amendment dated 17 February 2016 has now been granted **Full Approval**.

• Change in Title

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years

The ethical clearance certificate is only valid for a period of **3** years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

Best wishes for the successful completion of your research protocol.

Yours faithfully

....
Dr Shenuka Singh (Chair)

/ms

Supervisor: Dr I Govender
Academic Leader Research: Professor Brian McArthur
School Administrator: Ms Angela Pearce