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IMPACTS, CHANGES, AND TECHNICAL ISSUES THAT ARISE WHEN INTRODUCING AN ONLINE LEARNING TOOL IN A TERTIARY EDUCATIONAL ORGANISATION

By

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ABSTRACT

The introduction and use of online learning tools have been on the increase over the last decade. Educational organisations all over the world have implemented online learning to improve the accessibility to study from anywhere and at anytime. The process of introducing an online learning tool, the technical issues, and the changes that staff members endure to adapt to the online learning tool are some of the important factors in that affect adoption to the new software tool.

The purpose of this study was to find out the impacts, changes, and technical issues that occur when online learning is introduced in a tertiary educational organisation for distance learning students. Staff members at the educational organisation where the case study was conducted were surveyed and interviewed to find out the impacts, changes, technical issues, Information Technology (IT) support, and training that they experienced when the online learning tool was introduced.

Based on the responses received from the survey and interview it was apparent that most staff members at Organisation X are positive about the change that has occurred, because most of the responses from the staff members were positive towards the online learning tool although there were some technical and usability issues when they first started using the tool. It is also evident from the responses that sufficient IT support and IT training was provided to all staff members to help them understand the features and usability of the online learning tool.

The findings of this research support much of what has been in the literature. It is hoped that this report will serve as a guidance of the technical changes and impact on a staff member's role and responsibility that can occur when an online learning tool is introduced in an organisation.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

The growth of Information and multimedia technology and the use of the internet as for teaching has brought about revolutionary changes in the traditional teaching process (Wang et al. 2007; Tao et al., 2006). The ability to use mordern technologies such as videoconferencing, audio, internet, interactive TV and satellite for teaching has fueled the opportunity to introduce a new learning environment (Hung and Cho, 2008). The wide spread use of the internet has helped develop tools that enhance learning. Higher educational institutions have increasingly embraced online education. Hence more students are enrolling in distance programs. In response to this increased demands, many educational institutions have been working on implementing online learning (Kim & Bonk, 2006).

According to Kim and Bonk (2006), many universities have reported an increase in the use of online learning tools and efforts have sought to integrate emerging Internet technologies into the teaching and learning process in higher education. Tham and Werner (2005) demonstrated that the field of higher education sector must keep abreast with technological changes by providing ideal learning environment in order to respond to changing demand by students. Furthermore, educational institutions have devoted a huge amount of resources to develop their e-learning system to be competitive in the market (Ling and Moi, 2007).

With online learning tools, learning can happen at any time and in any place and does not necessarily have to be in a classroom. According to the review of e-learning definitions by Liu and Wang (2009), the characteristics of e-learning process are mainly based on the internet; information dissemination and knowledge flow; worldwide sharing of learning resources; and flexibility of learning. Using the internet, students can communicate, share and discuss with their instructors and peers.

As observed by Scagnoli (2005),

"the implications of introducing online learning in the traditional classroom are multiple, and affect the people (teacher and learner), the processes (teaching and learning), and the organizations."

Since the implications of online learning affect numerous areas as mentioned by Scagnoli, it is important to identify the technical issues and impacts that are faced by staff members throughout the organisation. The purpose of the research is to find impacts, changes and

technical issues that occur when an online learning tool is introduced into a tertiary educational organisation.

1.2   Statement of Purpose

The purpose of this study is to find the impacts, changes and technical issues arising from the introducing online learning in a tertiary educational organisation. The organisation where this research has been carried out would not like to be named hence in this thesis the organisation will be referred to as 'Organisation X'. Organisation X offered traditional distance learning to students before they developed their own customised online learning tool for distance learning students. The online learning was initially implemented for only distance learning students who were interested in online learning.

The thesis investigates the technical issues and changes that arose due to the introduction of the online learning tool at Organisation X, and how they were handled by the staff members from different departments. In addition, the technical training provided and the ongoing IT support will be analysed to see if this had a direct relationship to the level of impact or change on staff members.

The analysis and conclusion of this study will be delivered back to Organisation X for them to get an understanding of what were all the changes the staff members experienced and how the staff members handled the changes and hopefully make implementation changes.

1.3   Methodology

This study is a qualitative research.

"Qualitative research involves the use of qualitative data, such as interviews, documents, and participant observation data, to understand and explain social phenomena."

(Myers, 1997)

The qualitative research method used for this research was a case study.

In this study, a mixed data gathering method was used. Both a survey and an interview were conducted to gather data. According to Myer (1997), a survey is a quantitative method whereas an interview is a qualitative data source. Since a combination of the two was used to gather data, the study is qualitative research, which uses mixed data gathering methods to determine technical issues and changes that arose due to the introduction of the online learning tool. Both a survey and an interview were conducted to gather data from participants. An online survey using Survey Monkey was sent to 54 staff members at Organisation X. Later, seven staff members were selected randomly from the various departments and then each staff member was interviewed. The data gathered was analysed by the researcher.

The data gathered from the survey and interview was analysed based on a custom theoretical model developed from the combination of Roger's IDT theory and Hall's Level of Use model. Straub's paper "Understanding technology adoption theory and future directions for Informal learning" was studied to understand different theoretical models of innovation and diffusion. From the studied theory, a customised model named as Change Adaption Model (CAM) was created for the data analysis. This model is explained in detail in chapter 5. The data analysis was presented in tables. Statistical tests were not conducted on the data. Data gathered from the interviews were analysed using thematic analysis.

1.4   Research questions

The aim of the research is to identify the impacts, changes and technical issues that occur when implementing an online learning tool in a tertiary educational organisation. In order to achieve this, a set of research sub questions were identified. These research sub questions come under the umbrella of the main research question and provide further clarification. The main question for this study is:

What are the impacts, changes and technical issues that arise when introducing an online learning tool in a tertiary educational organisation?

The main research question can be broken down into the following sub-questions:

1.4.1   What were the changes faced by staff members of the college to adapt to the online learning tool?

When a new software tool is invented and introduced to users, there will be some sort of change that the user will have to go through to adopt or reject the innovation. This process is the diffusion process (Straub, 2009). Hence, it is important to identify what were the changes and how staff adapted to the online learning tool.

1.4.2   How were these technical impacts and changes handled by the various departments?

When an innovation is introduced, the diffusion of the innovation is based on an individuals' adoption patterns that illustrate a successful implementation (Straub, 2009). Therefore, it is essential to understand such aspects of the process.

1.4.3 What IT training before/after and ongoing IT support were provided to support transition to the online learning tool?

Before a new technology is introduced, it is desirable that IT training is given to users. Also, constant IT support is required to support the users of the tool. Identifying what IT training was provided and what IT support is in place will help answer the main research question.

1.5 Limitations

The results of this case study are limited to the thoughts and perceptions of the staff members at Organisation X and cannot be generalised to other tertiary institutes. It is also limited by the small sample from which data was gathered. This study is also limited by the views of one researcher and there is no statistical or quantitative analysis done.

1.6 Conclusion

An overview of the studied has been described. The background ,and the significance of the research and the methodology to be used has been explained. Other factors such as the limitations of the research have been outlined. It is hoped that this thesis will answer the questions raised in this chapter and provide suitable answers and conclusions for the targeted audience.

CHAPTER 2: LITERATURE REVIEW

2.1   Introduction

Literature from reputed journals, conference proceedings, online databases and books has been used to support the research conducted for this case study. The literature review section gives an overview of the research that has been conducted on the technical impacts and changes involved in introducing online learning. The impact of online learning tool in the education sector has been seen a growing trend and the literature reviewed supports this. The impact should be studied so that results obtained and reported can be used as a reference for educational institutions wanting to implement online learning. Looking at the literature shows that research in this area started more than a decade ago.

Young (2000) states that educational institutions that want to hold a place in the future with respect to the use of technology for and in education, need to start looking at implementing online learning tools. With the increased use and advancement in technology, people would prefer to have an option where they can study at any time from any place. In Ballard's opinion, technology is reshaping today's school systems and educational institutions by offering students new ways of learning and providing teachers new ways of teaching and administrators new ways of organizing educational system (Ballard, 2000). Organisation X wisely adopted state of the art technology to implement online learning in 2009 for distance learning students. Organisation X decided to advance and hold a place in the future by implementing online learning with the help of technology. With the introduction of online learning in 2009, the number of students studying online has increased over the years from 2010 and 2011.

Innovations in the field of technology and pedagogy innovation have enabled the development of virtual environments that bring about the possibility of learning with others at a distance. The development of these virtual environments is nowadays an expanding field of research (Blezu, 2008). Liaw et al. (2007) opine that e-learning that is characterized by multimedia made the learning process more active, enjoyable and interesting. Cost, service, quality, and speed are believed to be the main factors (Hammer and Champy, 2001) that have made e-learning a promising educational technology (Liaw et al., 2007). Due to this increased demand for introducing online learning in educational institutions, it is important to study the impacts and changes due to introducing online learning in an educational organisation.

2.1.1 Introducing online learning

E-learning is the effective learning process created by combining digitally delivered content with (learning) support services (Blezu, 2008). According to Blezu (2008) online learning is the transfer of skills and knowledge using electronic applications and processes. Many students appear to now study part time while working full time and this has led to increased demands of flexibility to courses and learning (Jafari, McGee & Carmean 2006).

According to Jamlan (2004), there are several cogent reasons for adopting and implementing online learning into an educational system. These include:

1. Growth of information technology: online learning has become an ideal delivery vehicle for education and learning;
2. Rich information source: online learning offers both teachers and learners access to any where, any time "information rich" resources;
3. Alternative learning strategy: online learning can reach those previously denied access (e.g., students with physical disabilities); and
4. Blended learning: E Learning can augment traditional classroom offerings, thereby freeing up valuable resources and expanding the offering to greater numbers of campus-based students (Jamlan, 2004).

Many factors affect the introduction of an online learning tool. According to Grainger and Tolhurst (2005), the effect of introducing online learning depends on the following factors. These include:

1. The way the technology is used;
2. The purpose of its use; and
3. The context in which it is used.

The above factors need to be considered in depth. In the case of Organisation X, the online learning tool, which in this case is the technology, will be used as a tool over the web for learning and building learning communities in the context of education.

According to Yuen, Law & Wong (2003) the characteristic of the leadership in the organisation that is implementing the online learning tool also contributes to the impacts and changes that arise. For Organisation X, the management always played a crucial role and was involved in every phase of developing and introducing the online learning tool.

When introducing online learning into a new context, it is necessary to have the full support of the staff members that will be using the online learning tool. The online learning tool will be used eventually by staff members of the organisation, and without their support in being confident with the online learning tool, it cannot be used effectively. To help staff members to adopt to using the online learning tool, Organisation X conducted a Web Enhanced Distance Learning (WEDL) pilot project which was undertaken by some key staff members who would use the online learning tool extensively. This was a gradual change for the staff members involved, as they were able to anticipate the change that would occur and also to contribute with their ideas and how things could be improved.

Blezu (2008) opines that a lecturer's use of online learning is related more to the attitude and confidence of the lecturer than their background characteristics or the context of the institution. However, this causal relationship has not been proved. Blezu states that:

> "it seems likely that the interrelationships between use, confidence, attitude and access operate multi-directionally, working to reinforce one another, either positively or negatively."

> Blezu (2008)

2.1.2 Features of online learning

The uniqueness of online education is that it provides easy access to peers and this allows the creation of a network of scholars which makes way for intellectual exchange, collaboration, collective thinking, and socialization (McDonald, 2002).

According to Thoms (2008), there are a number of advantages of online learning. Online learning uses state-of-the-art technology and instructional strategies. There is a meeting and sharing of cultures. Disabilities and inabilities can be accommodated, with or without the knowledge of other participants. Global access causes the classroom to be any place in the world. E-learning can be considered to be an "equalizer," whether we are talking about cultures, gender, geography.

According to Blezu (2008), collaborative e-learning is explained as follows:

> "Collaborative e-Learning is any kind of group learning that takes place mainly in virtual environments. It can be specified as follows: Modern communication tools enable an active horizontal communication flow between the learners. The basis of this learning scenario is communication, the coordination of the objectives and the quick exchange of data."

These virtual environments help learning to take place. Virtual groups can be formed using emails, discussion forums, or audio/video conferencing. In these virtual environments, new ideas and information sharing can take place without the restriction of time or place. There are numerous advantages of online learning hence more educational institutions are implementing online learning to help students experience learning with the help of technology and without time or geographical barriers.

Some of the benefits of online learning mentioned by Littlejohn and Higginson (2003) are:
- Easier communication with individuals and groups of students
- A wider range of available resources
- Releases time for more interactive forms of teaching
- Easier to amend and update materials

2.1.3 The change due to online learning

People adapt to change in different ways. According to Esterly and Logan (2008) in their paper 'Introducing instructional technology to a rural college campus' to help people to adapt to change, it is best if the change is introduced gradually. The change has to be announced to prepare people of the change that is coming and then train the user.

Esterly and Logan (2008) in their paper conclude saying that people play the biggest role when a change occurs and without good technical support and personal touch implementing technology will be a struggle but not impossible. To help handle change, IT support is required at all levels. According to Esterly and Logan quick response time and constant support help increase trust in customer service.

> "This also means that when a change is introduced there is more trust that the department won't leave them without support and in return reduces resistances to change."

(Esterly & Logan, 2008)

Kastelic and loncaric mention that "one of the most important things in introducing new technologies is the confidence of those who use the system. Customers must be certain that if something goes wrong, they would always have a 'rescue exit' – someone, who is going to help them (Kastelic & loncaric, 2007). Organisation X had a good team of experts who are well acquainted with the online learning tool. This was helpful as they were able to provide the required IT support for all staff members.

Bates & Poole (2003) opine that for the implementation of online learning to be successful the following should be ensured:

- Training in technology and pedagogy
- Good support system both academic and technical
- Availability of hardware and software for faculty and student use.

If the above minimal conditions are not satisfied it may have a negative impact on the people who will be using the online learning tool.

2.1.4 IT training for staff members using online learning

Esterly and Logan (2008) mention that training becomes important when there was an immediate need. It is important to offer training when it is needed however this need is not the same for everyone. Some individuals may need training to use the technology but others may not be ready to see the need.

Kim and Bonk (2006) stated that faculty training and support is a critical component of quality online education. New roles for online instructors require training and support. Some case studies of faculty development programs indicate that such programs can have positive impacts on instructor transitions from teaching in a face-to-face to an online setting.

Heinrich, Milne, Crooks, Granshaw and Moore (2006) stated that it was necessary that institutions be instrumental in providing staff members with suitable e-learning systems and training in both the technical and instructional requirements and provide support in the future.

2.1.5 Impacts of introducing online learning

According to Scagnoli (2005), impact of online education is about "three aspects, which are access, definition of classroom space and the implementation of practices."

1. Access to information is now not limited to the classroom nor is information confined to the classroom. Communication with the instructor or peers can take place at any time from any place. In this way, the faculty can be from any place and there is no limitation to geographical boundaries;

2. The second impact is on the classroom space. According to Scagnoli (2005), collaboration among students or students and researchers in different geographical locations is possible as long as they share the same virtual space of online learning. With the help of online communities such as discussion forums and reflective tasks,

communication between the instructor and the student can happen at any time and does not need to take place at a specified time or specified place; and

3. The final impact is implementation of practices that were not possible in classroom based learning. Constant discussions and collaboration among students and instructors and convenient classroom schedules are all implemented in online learning which has affected classroom based learning.

Ellis and Phelps (2000) note that major impact is on academic staff members. Academic staff members are required to be prepared for the changes in the pedagogical approaches that come with online learning. Staff members with less technology skills needs to adapt to the new system. Not only are staff members required to adopt technically, they are also required to learn new pedagogical approaches. According to Birch and Burnett (2009), the factors that affect the adoption of the technology are:

- Performance Expectancy

- Effort Expectancy

- Facilitating Conditions

Staff development is a major factor that needs to be considered when implementing online learning. According to Sprat, Weaver, Maskill and Kish (2003), academic staff members should be engaged in professional development, which will enable them to use the online learning tool proficiently.

In order to plan for professional development, the impact due to changes in staff members' responsibilities and day to day tasks that will occur due to the implementation of online learning need to be analysed. Yetton (1997) observes that, online teaching requires different skills when compared to traditional classroom based teaching. He also says that the interaction between students and instructors change and the instructors have a higher work load. According to Ellis and Phelps (2000), staff members that are not technically literate will find it difficult to adjust and their courses will be affected as they might not be able to adapt as quickly as a technically-competent instructor. The administration department will also be affected as their work will also include using the online learning tool.

McSporran and Young (2004) note that staff members in the organisation they studied where an online tool was implemented would need to acquire various computer skills, administration skills, online community skills, e-moderating skills and online pedagogical skills. These authors found that there was new learning that happened throughout the

organisation. Every department learned new skills, and the interaction between the departments changed. Another change that arose within the organisation was the increased need of technical support and training. For staff members to use efficiently the online learning tool, sufficient technical training and support should be provided. The organisation should be prepared to handle this change.

The impact of online learning is not only on the teaching modes or the staff members within the organisation, but also it is social impact that need to be considered. According to Lynch (1999), online learning improves social interaction with the help of discussion forums within an online learning tool. People can interact virtually through these forums hence improving social interaction. Collaborative learning allows active participation and interaction between peers and students and instructors.

The main people affected by the introduction of online learning are the learners and the teacher. Bates (2000) mentions that teachers need to be prepared to encourage students to adapt to the change and students need to be prepared for the change.

Tearle (2003) mentions that the most important factor that affects the implementation of technology is the whole educational institution by itself that is signified by a "strong leadership, excellence across the school operations, positive ethos and collaborative culture and well motivated and caring staff."

2.1.6 Social impacts of online learning

There are a number of advantages of online learning. Online learning involves the use of the best and latest technology and instructional strategies. Online learning can also be an "equalizer," whether we are talking about cultures, gender, or geography (Thoms, 2008).

According to Thoms (2008)

"The social implications of e-learning may be categorized into the following types of issues: cultural, gender, lifestyle, geographical, religious/spiritual, literacy, disabilities, and digital divide."

2.2   Conclusion

The literature surveyed and studied highlights the factors influencing the adoption of the online learning tool. This chapter identifies in literature some of the changes and its impact on staff members when an online learning tool is introduced. The importance of IT training and support for the tool is also discussed.

CHAPTER 3: METHODOLOGY

3.1   Introduction

In this chapter, the qualitative method used for this research is explained. A case study was conducted on Organisation X to understand the impacts, changes and technical issues that arose when the online learning tool was introduced in the organisation. The method of gathering data was through a survey and interviews with both open and closed questions.

3.2   Research Method

This study has been conducted with qualitative research using a case study methodology. This study uses a survey and interviews for data gathering. Staff members across all departments at Organisation X were given an opportunity to participate in a survey and seven randomly selected staff members were interviewed. The data collected was then interpreted and analysed in order to understand the impacts and technical issues that arose due to the introduction of the online learning tool.

3.2.1 Qualitative Research

Myer (1997) stated that quantitative research is used to study natural phenomena whereas qualitative research involves the use of qualitative data, such as interviews, documents, and participant observation data, to help understand and explain social phenomena.

According to (Schwartz, 2009), the two sciences that exist in the world is the science of the human world and the science of the natural world. The science of the human world cannot be studied with the help of mathematical analysis. It needs to be studied focusing on the subject which is the individual and how the individual perceives the object. Behaviour of the subject is an important factor in the method. Qualitative method aims to give an explanation of phenomena that are otherwise too complex to investigate. The other important factor in a qualitative method is the truthfulness of the information gathered. Interviews, surveys, and questionnaires are the usual methods of gathering information. Case studies are considered be a safe and pragmatic way to investigate any current phenomena occurring in real life. The case study method can be used even when there is no clear demarcation between the object and the context under which it is studied (Soy, 2006).

Qualitative research uses descriptive statistics that endeavours to explain a situation. Denzin and Lincoln (2000) stated that a qualitative researcher uses a wide range of interpretive

methods seeking ways to have a better understanding of a situation. For this study, a theoretical framework was developed from literature based on Roger's IDT model and Levels of Use model. This customised framework or model was named as the Customised Adoption Model (CAM). The data gathered was interpreted using this model. Each response was mapped to this model. A case study methodology was used for this study. Denzin and Lincoln explained qualitative research as a five-phase process. This five-phase process has been used as a guideline for this study's research process.

Phase 1: The Researcher as a Multicultural Subject	• History and research traditions • Conceptions of self and others • Ethics and politics of research	1. Role as a researcher 2. Ethics and policies at Organisation X and Unitec
Phase 2: Theoretical Paradigms and Perspectives	• Positivism, post-positivism • Interpretivism, constructivism, hermeneutics • Feminism(s) • Radicalised discourses • Critical theory and Marxist models • Cultural studies models • Queer theories	1. Study was post-positivist in nature as it provided opportunity to work in realistic environment in organisation X 2. Multiple data gathering methods used 3. Inference drawn from participant response
Phase 3: Research Strategies	• Study design • Case study • Ethnography, participant observation, performance ethnography • Phenomenology, ethnomethodology • Grounded theory • Life history • Historical method • Action and applied research • Clinical research	1. Case study methodology was used
	• Interviewing • Observing	1. Data was gathered through survey and

		interviews
Phase 4: Methods of Collection and Analysis	• Artefacts, documents and records • Visual methods; auto ethnography • Data management methods • Computer-assisted analysis • Textual analysis • Focus groups • Applied ethnography	2. Analysis was done on the gathered data using the Customised Adoption Model (CAM)
Phase 5: The Art, Practices and Politics of Interpretation and Presentation	• Criteria for judging adequacy • Practices and politics of interpretations • Writing as interpretation • Policy analysis • Evaluation traditions • Applied research	1. Interpretation of the data collected

Table 3.1: Research process by Denzin & Lincoln (2000, p20)

The research process outlined by Denzin and Lincoln in table 3.1 was used as a guideline to determine the 5 phases of this study.

Phase 1:
The first step in this phase involved the acceptance of my role as a researcher. Also taken into consideration was the ethics and policies at Organisation X. Organisation has its own research ethics committee. The research proposal for this study was submitted to this committee for approval. It was ensured that research ethics as per the guidelines of the Research Ethics Committee at Organisation X have been applied to this study.

Phase 2:
Based on the interpretive paradigms explained by Denzin and Lincoln, this study is post – positivist in nature. According to Myer, the paradigms that can be used for qualitative research can be either positivist, interpretive or critical. According to Denzin and Lincoln (2000), post-positivism relies on multiple methods as a way of capturing as much reality as possible and at the same time emphasizes the discovery and verification of theories. From the above definition of the paradigms of qualitative research, this research study falls under the post-positivist category as this study allows the research to work in a realistic environment, which is Organisation X rather than in an experimental setting. Multiple

methods were used to gather data for this study. Surveys and interviews were used to gather realistic data. This data allows inferences to be drawn about the online learning tool from this small population of participants.

Phase 3:

In stage 3 of the research process, the research strategies are defined. This research study uses a case study. Benbasat et al (1987) opined that the case study research method is well-suited to technology research, since the main objective is the study of technology in organisations. A case study was conducted on Organisation X to carry out this study. Information needed from the organisation was gathered and then interpreted and analysed.

Phase 4:

Stage 4 of the research process is very important and it refers to the data collection and analysis for the study. There were 3 sources of data for this study:

1. **Literature:** Literature in this area included reviewing other studies to obtain knowledge of research in this area and the implications and the basic factors that are involved in introducing online learning in an educational organisation.

2. **Survey:** Fifty-four staff members from organisation X were sent an online survey.

3. **Interview:** Seven staff members from the population of fifty-four participants were interviewed. The two types of sampling techniques are:
    1. Probability sampling technique and
    2. Non probability sampling techniques (Zikmund, 2003)

    The second method was chosen as it provided a convenient way to sample the population and it was also cost and time efficient. The non-probability sample data gathering provided a direct link to the participants/objects. Hence, all ideas and thoughts can be clarified. The interview with the participants allowed this.

Phase 5:

The last phase of the research involves writing of the interpretation of the data collected. The survey and the interview responses are interpreted to explain what the participants felt and how they responded and adapted to the change that took place in the organisation.

3.2.2 Case study

Myer (1997) stated that 'case study' has multiple meanings, and this term can used to refer to a unit of analysis or a research method. Case study is the most commonly used qualitative research method in information systems. Myer also opined that a case study research method is well suited for information systems because the object of discipline is "the study of information systems in organisations".

As per Myer's definition of a case study, this research involves the study of the   change and technical issues that arose due to the online learning tool (which is the information system) in Organisation X. The case study methodology has been used for this research.

According to Benbasat et al. a case study (1987, p.370) is considered to be viable for three reasons:

- It is necessary to study the phenomenon in its natural setting: The study was conducted at Organisation X, which is an educational organisation. The data was gathered through surveys and interviews in the natural setting of Organisation X.

- The researcher can ask "how" and "why" questions, in order to understand the nature and complexity of the processes taking place: Based on the data gathered questions were asked on "how" and "why" certain things happened.

- Research is being conducted in an area where few, if any, previous studies have been undertaken.

A definition compiled from a number of sources (Stone, 1978; Benbasat, 1984; Yin, 1984; Bonoma, 1985) in Benbasat et al. (1987, p.370), is as follows:

> A case study examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups or organizations). The boundaries of the phenomenon are not clearly evident at the outset of the research and no experimental control or manipulation is used.

Based on the above definition, a case study is the appropriate for this study because the study took place in a natural setting within Organisation X where data was gathered using surveys and interviews. According to Yin, there are there types of case study research exploratory, descriptive, and explanatory.

The entire process of undertaking the case studies research is as shown in the diagram in Figure 1.
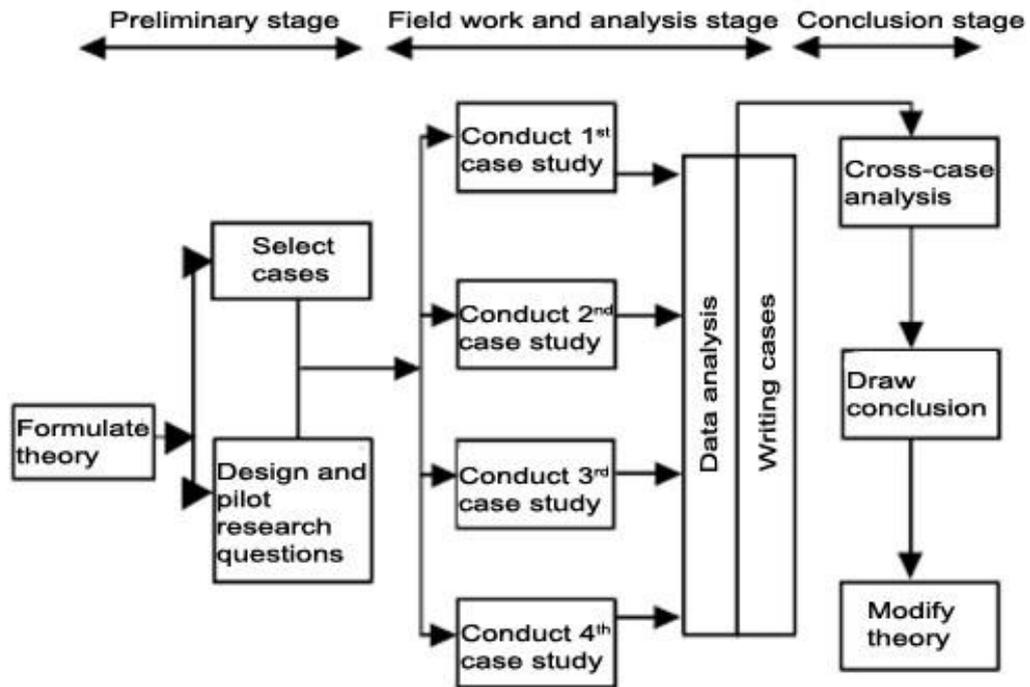
Figure 3.1: Stages involved in case studies (Myer, 1997)

The above case study process was used as a framework for this study. Myer's model above shows 4 different case studies being conducted, however for this study, only one case study was conducted on Organisation X. The difference between this case study and the model in figure 3.1 is that only one case study was conducted in the fieldwork and analysis stage.

Preliminary stage: A study of the literature involving research in this area was done before going into Organisation X and collecting the data. The main research question was formulated and the sub research questions were derived, which helped answer the main research question. Data gathering methods were also decided upon at this stage.

Fieldwork and Analysis stage: The actual case study was conducted when data was gathered by surveying and interviewing the participants. A list of participants from Organisation X was received from the project manager at the organisation. Fifty-four participants at Organisation X were given an opportunity to participate in the survey. From the 54 participants, seven participants were selected randomly to be interviewed. Data analysis was then done based on the data gathered through surveys and interviews.

Conclusion stage: This stage involved reporting on the data gathered. The analysed data was used to provide a descriptive conclusion of the study that was conducted.

3.3 Methodology

This section gives an overview of the participant population, the data gathering procedures and the ethical consideration.

3.3.1 Participant population

It was important to get as many participants from Organisation X for this study. The project manager at Organisation X was contacted for the list of participants who could take part in this study. A total of fifty-four staff members from organisation X were given the approval to participate in this study. Hence, these 54 staff members were the participant population.

3.3.2 Data gathering procedures

A survey and an interview were conducted to gather data. Fifty-four staff members from all departments were surveyed. An online survey was created using Survey Monkey. The link to the survey on Survey Monkey was emailed to 54 staff members from the various departments. From 54 staff members, seven staff members were then selected randomly and interviewed. The data gathered from the survey was analysed and interpreted to answer the main research question.

Survey

The survey aimed to obtain high-level information of what technical issues were faced when using the online learning tool and what was the level of impact of staff members due to the introduction of the tool. An online survey using the website Survey Monkey was designed. The survey had a total of thirteen questions of which twelve were multiple choice questions and one was a rating question. The survey was sent in an email to the project manager at Organisation X who then sent it to 54 staff members. Email and an online survey was preferred because all staff members at Organisation X had computer facilities and it was more straightforward for them to complete an online survey rather than a written survey. A timeframe of 2 weeks was given for the survey to be completed.

The results were analysed and responses with similar characteristics and attributes were identified. Overall, there was a good response from the staff members as nine participants responded within 5 minutes of the survey being sent out.

Interview

For the interviews, seven staff members were selected randomly from those who had been selected to complete the online survey. Interviews were conducted in this research to obtain more in-depth information from participants.

- **IT Trainer:** The IT trainer who trains staff members on how to use the tool technically and an IT trainer who gives pedagogical training were both interviewed. These interviews gave an opportunity to gather information on how IT training was provided to all staff members and what type of technical questions was raised and how they were answered

- **IT Support:** The person handling application support after the online learning tool was introduced was interviewed. This interview helped identify the technical issues faced after the tool was introduced

- **Academic:** Two academic staff members were interviewed. One lecturer who has good experience working with online learning tools and another lecturer who was using the online learning tool for the first time were interviewed. These extremes helped the researcher identify the level of technical impacts due to the introduction of the online learning tool

- **Administration:** Two administration staff members who handle allocation and return of assignments in the online learning tool were interviewed.

The questions asked in the survey and the interview can be found in Appendix A of this study.

3.4   Data analysis and interpretation

The theoretical model developed for analysis of the survey and interview data is a combination of Roger's IDT and CBAM's LoU model. This is a custom model that integrates the two models mentioned above. A combination of the two models was used because both these models focus on the different phases that the user goes through to adapt the innovation and the level of use in each stage. These models apply to the way the innovation was adapted and diffused at Organisation X. This custom model was named **Change Adaptation Model (CAM).**

The following is the framework of the customised model for the survey analysis. The following table was used to analyse each of the 18 survey responses.

Survey Question	Stage in IDT	Stage description	Stage in Level of Use	Description of use
	1: The first time the individual knows about a new technology		Non-use	
	2: The period during which the individual gets to know the basic features of the new technology		Orientation	
	3: The decision to adopt the innovation or reject it		Preparation	
	4: Putting the new technology into practice after accepting it.		Mechanical	
	5: Period of reflection		Routine	

Table 3.2: Change Adoption Model for Survey analysis

The following is the customised model for interview data analysis. Each of the interview responses were analysed using this model.

Interview Question	Stage in IDT	Stage description	Stage in Level of Use	Description of use
	1: The first time the individual knows about a new technology		Non-use	
	2: The period during which the individual gets to know the basic features of the new technology		Orientation	
	3: The decision to adopt the innovation or reject it		Preparation	
	4: Putting the new technology into practice after accepting it.		Mechanical	
			Routine	
	5: Period of reflection		Refinement	
			Integration	
			Renewal	

Table 3.3: Change Adoption Model for Interview analysis

A summary table for the survey data and interview data was then produced to triangulate between the survey and the interview data.

3.5   Ethics

Before the commencement of this study, completed ethics forms along with the research proposal were submitted to Unitec's ethics committee for approval.

3.5.1   Informed consent

To conform to Unitec's ethical standards, a participant information sheet and a consent form were prepared for both the survey and the interview giving participants information about the purpose of the research, their role as a research participant and the time they would spend on this study. A copy of the participant information sheet and consent forms is in Appendix A of this thesis.

3.5.2   Report

The results of the research form the thesis of the Masters of Computing at Unitec Institute of Technology.

3.6   Conclusion

This chapter describes in detail the research design. The selection of the research method has been justified with the help of literature. The detailed research methodology has been explained in this chapter.

CHAPTER 4: ANALYSIS

4.1   Introduction

This chapter examines in detail the data obtained from the survey and the interviews. Descriptive statistics have been used to analyse the data gathered.

4.1.1 Demographics for survey – Participation from the departments

The survey was sent to 54 staff members at Organisation X from the academic, administration, enrolment, and IT department. Eighteen staff members responded to the survey. One staff member each responded from the administration and enrolment departments. There was a good response from the academic and IT department with nine and seven staff members responding respectively.

Department	No. of Responses	Total Number of staff in the department	% Response
Administration	1	8	12.5
Academic	9	28	32.14
Enrolments	1	2	50
IT	7	15	46.67

Table 4.1: Number of respondents for the survey from each department

Participation by Department
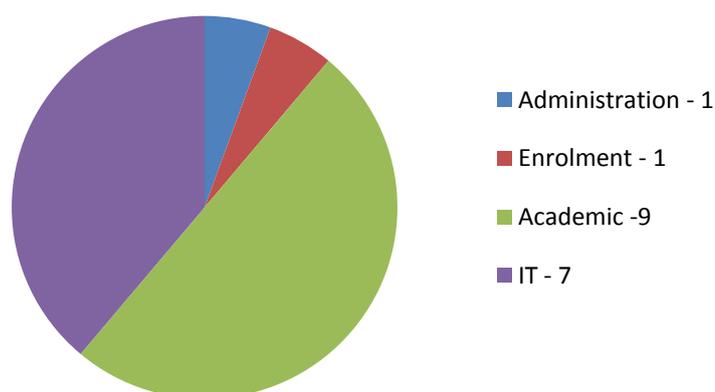
Figure 4.1: Participation by Department for the survey

4.1.2 Demographics for survey and interviews – Participation by Gender

Demographic questions such as age and gender were asked to the participants of the survey. Out of the eighteen respondents, ten were females and eight were males. For the interviews, there were 5 male participants and 2 female participants.

Male	Female
8	10

Table 4.2: Participation by Gender for surveys

Male	Female
5	2

Table 4.3: Participation by Gender for interviews
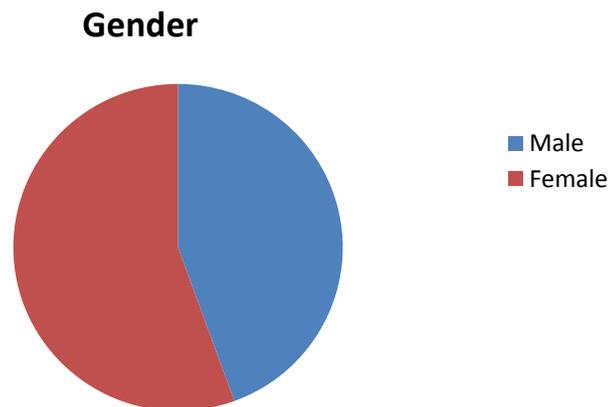
Gender

Figure 4.2: Participation by Gender for survey
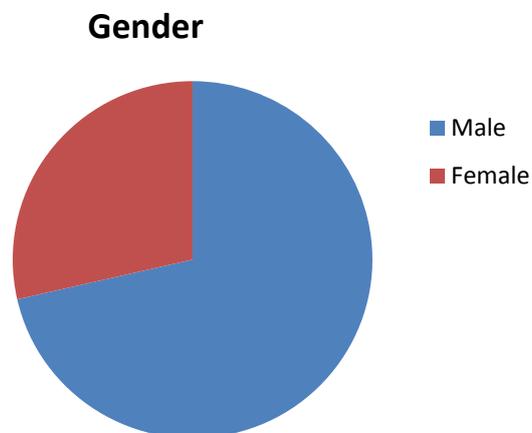
Gender

Figure 4.3: Participation by Gender for interviews

Seven staff members were interviewed. Each of the interviews were audio recorded and then transcribed. The interview questions to the three main research questions have been explained in chapter 2. The relationship of the interview questions to the main research questions is shown in Table 4.4.

Main Research Questions	What were the technical impacts faced by staff of the college? (Technology related)	How were these technical impacts and changes handled by the various departments? (Staff related)	What IT training before and after and ongoing IT support were provided to support transition to the online learning tool? (IT support related)
Interview Questions	1. What was your initial reaction when you heard that online learning was going to be introduced? 2. What were the changes to your responsibilities in your role after the online learning tool was introduced? 3. To what extent have these changes impacted you?	1. What skills if needed did you have to learn? 2. What technical problems have you faced while using the tool? 3. How have you adapted yourself to using the online learning tool?	1. What IT Training was given before the tool was introduced? 2. How did you train staff? 3. What kind of technical issues are raised by staff during training? 4. Who do you refer the technical issues to? 5. What problems did you face during the training sessions?

Main Research Questions	What were the technical impacts faced by staff of the college? (Technology related)	How were these technical impacts and changes handled by the various departments? (Staff related)	What IT training before and after and ongoing IT support were provided to support transition to the online learning tool? (IT support related)
	4. Which mode of learning do you prefer? Classroom or online	4. What features of online learning do you like the most and why? 5. What in your opinion are the positive impacts of introducing online learning? 6. What in your opinion are the negative impacts of introducing online learning? 7. How have you benefited overall? 8. If given a chance what would you have changed in the way online learning was introduced?	6. What problems did you face after the training sessions? 7. What difference did you notice between training a person experienced in using online learning tools and person new to online learning? 8. How do you learn about new updates to the online learning tool? 9. How was IT support provided after the online learning tool was introduced? 10. What type of IT support do you provide for staff?

Table 4.4: Relation of interview questions to the main research questions

4.2   Diffusion of Innovation

Straub (2009) in his paper "Understanding technology adoption theory and future directions for Informal learning" has explained in depth the different theories that are in use and have been used to study how innovation becomes accepted by the general population. According to Straub, innovation is an idea, practice or object that is perceived as "new" by an individual or a group aware of the innovation. Adoption and Diffusion models help to understand an innovation and how it is diffused into society. The following models have been explained by Straub:

- Roger's Innovation Diffusion Theory (IDT)
- The Concerns Based Adoption Model (CBAM)
- Technology Acceptance Model (TAM) and
- United Theory of Acceptance and Use of Technology Model (UTAUT).

4.3   Adoption and Diffusion of Innovation

Rogers (1995) defines innovation as "an idea, practice or object that is perceived as new by an individual or other unit of adoption" (p. 11). In this study, the online learning tool is the innovation that was introduced in Organisation X. Rogers (1995) defines diffusion as "a process by which an innovation is communicated through certain channels over time among the members of a social system" (p.5). In this study, diffusion will be the process used to introduce the online learning tool at Organisation X and the communication channels that were used to communicate to staff members about the change and the way staff members adopted the innovation.

4.4   Adoption and Diffusion Theories

According to Straub (2009), the adoption theories examine the individual and the choices taken by the individual to accept or reject the innovation in other words it is a micro-perspective on the change whereas diffusion theories is the macro-perspective on the spread of the innovation over time.

For this study, Roger's Innovation Diffusion Theory has been used because of the broad foundation and it is the basis for understanding adoption to an innovation, which is the online learning tool in this study (Straub, 2009). This study aimed to find the impacts and technical issues that occur when a technology that is the online learning tool was introduced at Organisation X. Rogers provided a comprehensive structure for understanding individual adoption and, collectively, diffusion (Rogers 1995).

According to Rogers (1995), there are four primary components of diffusion theory and they are:

1. the innovation itself;
2. communication channels;
3. social system; and
4. time.

These four elements interact to describe how individual adoptions combine to represent diffusion.

4.5   The Innovation

An innovation is defined by Rogers & Agawala-Rogers (1976) as "an idea practice or object perceived as new by the receiver" (p.12). Hence, the innovation does not need to be new as long as it is perceived as new by the individual or group to which the innovation is to be diffused. Online learning tools such as Moodle and Blackboard have been available since 1997 but Organisation decided to implement an online learning tool in 2009. The online learning tool is a state of the art software tool designed and built by the IT department at Organisation X. Hence, this new online learning tool was the innovation that was introduced to all staff members at Organisation X.

Rogers (1995) identified five attributes of an innovation that contributes to its adoption:

- **Relative advantage:** It is the perception that the innovation will have an advantage over an existing system. Will it make work faster and easier. For management it will be an advantage if it will make work more efficient as well as be lighter on the budget. If it has more advantages it will be more easily adopted

- **Compatibility:** It is the perception that the innovation will be compatible with existing systems thoughts and ideas. If so then it will be more easily adopted.

- **Complexity:** It is the perception of how difficult the innovation will be to use. An innovation which is easier to use will be adopted quickly

- **Trialability:** This refers to the use of the innovation on the trial basis to see how easily it can be adopted

- **Observability:** It is characterised on how easily the innovation is available for use. If the innovation is not easily accessible to the user, then the adoption process will take much longer than if the innovation was easily available.

The five attributes of innovation have been applied to the introduction of the online learning tool at Organisation X as follows:

Attributes of innovation which makes adoption easier	Organisation X
Relative advantage	The Online learning tool will help build communities of learning at Organisation X It will improve communication with students Distance learning students would now be able to submit assessments online instead of physically dropping it off at the college Marking online will improve the marking process for lecturers
Compatibility	All study material will now be available to students online and will be compatible with the learning process
Complexity	The online learning tool is user friendly and navigation around the system is easy and intuitive
Trialablity	A professional development site, which is the replica of the online learning tool is available for staff to trial before they start using the online learning tool
Observability	Staff can look the existing site and attend training to observe how the tool is being used

Table 4.5: Attributes of innovation applied to Organisation X

4.5.1 Communication Channels

Communication is part of the social process and is of high importance in the diffusion process. It is very important how the innovation is introduced to the society. Effective communication can give a sense of confidence to the group of society that will be using the innovation.

This can be direct communication, vicarious observations of peers and models, or even the influence of mass media (Bandura, 2001; Rogers, 1995).Communication between the departments and staff members with the management will make the diffusion process a little

easier. When staff are often updated with how the innovation will be introduced and how it will impact their day to day task, they will be prepared for the diffusion process and thus making the adoption of the technology smoother and will contribute to more people accepting the change rather than rejecting the change.

4.5.2 Time

Each individual is different from the other. Some individuals take a short time to adopt to an innovation whereas others may take a longer time due to various reasons. To understand this better Roger categorised the adopters into groups based on the time they take to adopt the innovation. The diffusion curve shows that there is a small percentage of early adopters, a large percentage of early and late majority and finally a small group of later adopters.
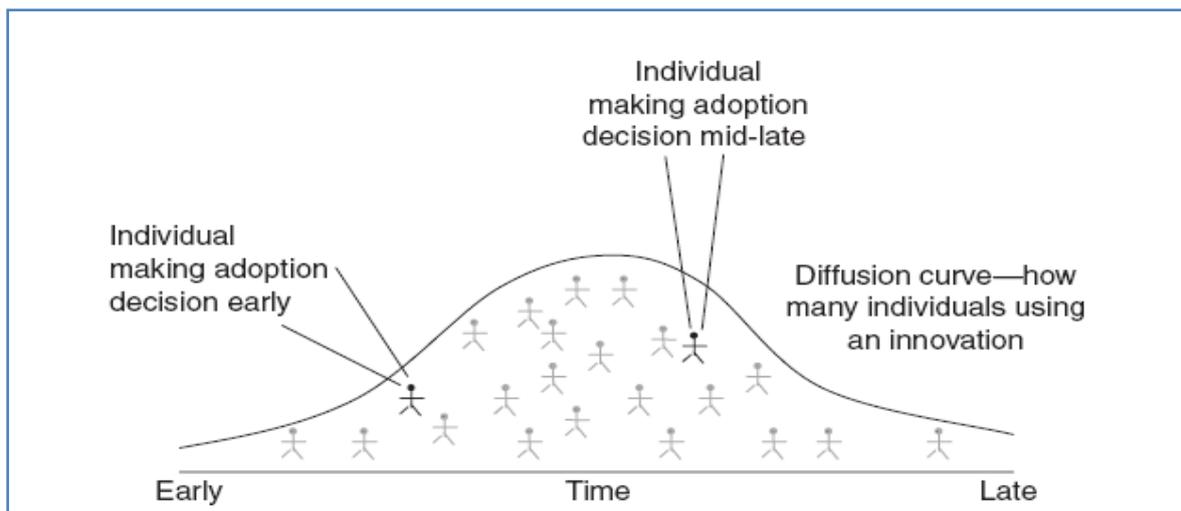
Figure 4.4: How individual adoptions compose diffusion (Straub, 2009)

The adoption does not take place instantly but it is a process that an individual goes through to either accept or reject an innovation. Hence, the entire diffusion takes place over a period of time. Rogers (1995) describes the decision process as five stages that individuals go through during their evaluation of an innovation.

- **Stage one:** The individual becomes aware of an innovation.
- **Stage two:** The individual gains individual gains enough knowledge about the innovation's features
- **Stage three:** The individual decides whether to adopt or reject an innovation.
- **Stage four:** The individual decides to act on their decision to either adopt or reject the innovation.
- **Stage five:** This is the confirmation where the individual reflects on his or her decision and re-evaluates whether to continue or discontinue with the innovation adoption (Rogers, 1995).

4.5.3 Social

Rogers (1995) defined the social system as "a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal" (p. 23). As a broad definition, social systems could be work environments, organizational groups, informal group, and all the various subsystems of any of these groups. Social norms such as context, culture, and environment influence the way the innovation diffuses into the group.

4.5.4 Application of the Innovation Diffusion Theory at Organisation X

Rogers (1995) four key elements of diffusion of an innovation can be applied to Organisation X as follows:

- **The innovation:** Introduction of the online learning tool at Organisation X
- **Communication Channels:** The communication between management and staff the support of the experts of the online learning tool. Documentation, training and user guides were provided for staff members to help them use the various features of the online learning tool
- **Time:** The online learning tool was introduced at Organisation X in 2009. The period of study was from 2009 – 2011
- **Social System:** The social system was the environment at Organisation X.

4.6 The Change

The adoption of the online learning tool at Organisation X is a change that will take place throughout the organisation.

The Concerns-Based Adoption Model (CBAM) developed by Hall approaches adoption through the eyes of the adoptees (Straub, 2009). CBAM has been used in a variety of settings including education based professions (Bailey & Palsha, 1992) and can be used to study the change at Organisation X, which is an educational organisation. CBAM helps ease the change process. CBAM was developed based on the following six assumptions (Hord, Rutherford, Huling-Austin, & Hall, 1987):

- Change is a process, not an event: Change is not an event that takes place on one day, but it is a process that happens over time where decisions are to be made, and processes to ease the change over are documented.

- Change is accomplished by individuals: Only when individuals decide to accept the change, will the change take place. Even if half decide not to change, then the change is still incomplete even though the other half has decided to accept the change

- Change is a highly personal experience: Each individual will go through this experience to contribute to the change

- Change involves developmental growth: The change will have an impact on the individual in some form or the other. In most cases in the field of education, there will be some development growth for the individual in terms of a learning experience

- Change is best understood in operational terms

- The focus of facilitation should be on individuals, innovations, and context that will help facilitate the change.

These assumptions form the basis of the three components of the concerns based model: Stages of Concern (SoC), Levels of Use (LoU), and Innovation Configuration (IC). These components explain how to best facilitate the adoption of the innovation (Straub, 2009).

Levels of Use:

The level of use model describes the diffusion of innovation through the LoU scale. LoU provide a framework for understanding the behavioural implementation of an innovation. The LoU break down the actions into categories from the lowest behavioural implementation non-use to renewal, the highest. Concerns-Based Adoption's (CBAM) LoU model was used to provide a perspective on how an adoptee's concerns influence the integration of an innovation. LoU breaks down the actions of user into categories from non-use at the lowest behavioural implementation to renewal, the highest, indicating a teacher transforming and extending the innovation (Straub, 2009). This relates the staff at Organisation X from the stage becoming familiar with the innovation to the stage when they are extend towards the innovation.

Level	Name	Description of use
0	Nonuse	The individual does not use the innovation or has no intention to use the innovation
1	Orientation	The individual seeks more information about the innovation but has not decided whether to use it.
2	Preparation	The individual gets ready to use the innovation.
3	Mechanical	The individual begins implementing the innovation, but struggles to get a full understanding
4A	Routine	The individual successfully uses the innovation.
4B	Refinement	The individual changes the innovation to suit their needs.
5	Integration	The individual shares the implementation of the innovation with their peers.
6	Renewal	The individual tries to transform the innovation for the better

Table 4.6: Stages and descriptions of levels of use (Anderson, 1997)

4.7   Analysis of Survey and Interview data

The theoretical model developed for analysis of the survey and interview data is a combination of Roger's IDT and CBAM's LoU model. This is a custom model, which integrates the two models mentioned above. A combination of the two models was used because both these models focus on the different phases that the user goes through to adapt the innovation and the level of use in each stage. These models apply to the way the innovation was adapted and diffused at Organisation X. This custom model developed after in depth analysis was named as **Change Adaptation Model (CAM).**

Theoretical model for survey:

The questions in the survey were not in depth and aimed to give a high level of understanding of the impact of the change due to online learning being introduced hence, the analysis based on the LoU model can apply only until the routine stage.

It is important to note that all staff members at Organisation X were required to use the online learning tool based on individual roles and responsibilities. There is no option where the staff member can choose to reject the online learning tool. Hence in the data analysis, sections or stages that discuss the user choosing to accept or reject the innovation will be indicated as the user choosing to accept the online learning tool.

4.8   Colours and scores:

The intensity of colours shows the rating progressing from 1-10. 1 being the lightest colour and 10 being the brightest signifying the maximum possible score.

4.9   Analysis of survey data

Survey Participant 1 (SP1)

Demographic Information				
Age: 31 – 40				
Gender: Male				
Department: IT				
Computer Skills: 8				
Hours on the computer each day: 6 – 8 hours				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Much change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced much change.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Adapting to new IT skills	The participant is required to learn new IT skills to use the online learning tool. This indicates that the user took a longer time to adapt to the innovation
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful, 4 =quite useful, 5 =very useful	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 0 E-messages: 0 Notice board: 2 Online classroom: 3 Online assessment submission:1 Online assessment allocation/reallocation:2 Online marking:1 Online return of	The individual successfully uses the features of the online learning tool. The average rating by this participant is 1.5

			assessments:2 Grade book: 3	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Equally positive and negative impacts	The participant has found the impacts equally positive and negative.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 1 (SP1) in the survey. SP1 is a male in the age group from 31 – 40 from the IT department. SP1 has given himself a rating of 8 on 10 for computer skills. The introduction of the online learning tool has caused much change in this participant's roles and responsibilities. This could be because the participant is from the IT department, which was highly involved in the introduction of the online learning tool. A major problem that this participant faced to adapt to the online learning tool was to learn new IT skills. The participant finds the features of the online learning tool to be slightly useful based on an average rating of 1.5 for the features. This participant found the impacts to be equally positive and negative.

Survey Participant 2 (SP2)

Demographic Information
Age: less than 31
Gender: Male
Department: IT
Computer Skills: 10
Hours on the computer each day: 6 – 8 hours

Survey Question	Stage in IDT	Stage in Level of Use	Response	Description of Level of Use based on response
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about	Non-use	Yes	The participant uses the online learning tool (the

	a new technology			innovation)
What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Total change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced a total change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Speed problems	The participant has found speed to be a problem in the online learning tool indicating that there were no other major issues when using the innovation.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 0 E-messages: 4 Notice board: 0 Online classroom: 0 Online assessment submission: 4 Online assessment allocation/reallocation: 0 Online marking: 0	The individual uses the features of the online learning tool. The average rating by this participant is 2.0

Survey Question	Stage in IDT	Stage in Level of Use	Response	Description of Level of Use based on response
3 =moderately useful, 4 =quite useful, 5 =very useful			Online return of assessments: 0 Grade book: 4	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Mainly positive impacts	The participant has found the impacts equally positive and negative.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 2 (SP2) in the survey. SP2 is a male in the age group of less than 31 from the IT department. SP2 has given himself a rating of 10 on 10 for computer skills. The participant has experienced total change in responsibilities due to the introduction of the online learning tool. This indicates that the participant would have taken a longer time to adapt to the innovation. The participant has found speed to be a problem when using the online learning tool. The participant finds the features of the online learning tool to be slightly useful based on an average rating of 2.0 for the features. This participant found the impacts to be mainly positive.

Survey Participant 3 (SP3)

Demographic Information
Age: 41 - 50
Gender: Female
Department: Academic
Computer Skills: 5
Hours on the computer each day: 4 – 6 hours

Survey Question	Stage in IDT	Stage in Level of Use	Response	Description of Level of Use based on response
Have you used the online learning tool	**Stage 1:** The first time the individual	Non-use	Yes	The participant uses the online learning tool

ecelearn?	knows about a new technology		(the innovation)	
What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Minimal change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced much change.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Adapting to new IT skills	The participant is required to learn new IT skills to use the online learning tool. This indicates that the user took a longer time to adapt to the innovation
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 4 E-messages: 4 Notice board: 4 Online classroom: 4 Online assessment submission:5 Online assessment allocation/realloca	The individual successfully uses the features of the online learning tool. The average rating by this participant is 4.5 indicating that the participant

			tion: 5	finds the
4 =quite useful, 5 =very useful			Online marking: 4 Online return of assessments: 4 Grade book: 5	features very useful
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Mainly positive impacts	The participant has found the impacts equally positive and negative.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 3 (SP3) in the survey. SP3 is a female in the age group of 41 - 50 from the Academic department. SP3 has a computer skill rating of 5 out of 10. This could indicate why the participant had to adapt new IT skills to use the online learning tool. The participant has experienced very little change in responsibilities due to the introduction of the online learning tool thus indicating that the orientation stage would have been easier for this participant. The participant finds the features of the online learning tool to be very useful based on an average rating of 4.0 for the features. This participant found the impacts to be mainly positive.

Survey Participant 4 (SP4)

Demographic Information				
Age: 41 - 50				
Gender: Female				
Department: Academic				
Computer Skills: 7				
Hours on the computer each day: 2 – 4 hours				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online	**Stage 1:** The first time	Non-use	Yes	The participant uses the online

learning tool ecelearn?	the individual knows about a new technology			learning tool (the innovation)
What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Much change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced much change.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Speed problems internet disconnecting and losing data	The participant has been required to learn new IT skills to use the online learning tool. This indicates that the user took a longer time to adapt to the innovation
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 3 E-messages: 4 Notice board: 3 Online classroom: 1 Online assessment submission:4 Online assessment allocation/reallocatio n: 4 Online marking: 4 Online return of assessments: 4	The individual successfully uses the features of the online learning tool. The average rating by this participant is 3.0 indicating that the participant finds the features useful to quite an extent.

			Grade book: 0	
4 =quite useful, 5 =very useful				
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Equally positive and negative impacts	The participant has found the impacts equally positive and negative.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 4 (SP4) in the survey. SP4 is a female in the age group of 41 - 50 from the Academic department. SP4 has a computer skill rating of 7 out of 10. The participant has experienced much change in responsibilities due to the introduction of the online learning tool. The participant might have experienced much change because the participant is from the Academic department that uses the online learning tool to a large extent. The participant has found speed and the internet connectivity to be a problem when using the online learning tool. The participant finds the features of the online learning tool to be very useful based on an average rating of 3.0 for the features. This participant found the impacts to be equally positive and negative.

Survey Participant 5 (SP5)

Demographic Information				
Age: 41 - 50				
Gender: Female				
Department: Academic				
Computer Skills: 5				
Hours on the computer each day: 6 – 8 hours				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

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What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Minimal change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced much change.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	freezing' while marking,	The participant has found marking to be an issue with online learning. This indicates that the participant was able to use the other features quite well.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful, 4 =quite useful, 5 =very useful	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 5 E-messages: 4 Notice board: 3 Online classroom: 3 Online assessment submission:5 Online assessment allocation/reallocation: 0 Online marking: 5 Online return of assessments: 0	The participant finds the features of the online learning tool useful to some extent. The average rating by this participant is 2.5.

			Grade book: 0	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Equally positive and negative impacts	The participant has found the impacts equally positive and negative.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 5 (SP5) in the survey. SP5 is a female in the age group of 41 - 50 from the Academic department. SP5 has a computer skill rating of 5 out of 10. The participant has experienced very little change in responsibilities due to the introduction of the online learning tool thus indicating that the orientation stage would have been easier for this participant. The participant has found that the marking tool freezes at times when using the online learning tool. The participant finds the features of the online learning tool to be slightly useful based on an average rating of 2.5 for the features. This participant found the impacts to be equally positive and negative.

Survey Participant 6 (SP6)

Demographic Information
Age: 31 - 40
Gender: Female
Department: Academic
Computer Skills: 8
Hours on the computer each day: More than 8 hours a day

Survey Question	Stage in IDT	Stage in Level of Use	Response	Description of Level of Use based on response
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Minimal change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced minimal change.
What IT related problems have you faced while using the online learning tool?

Are the IT related problems you face while using ecelearn at home? | **Stage 3:** The decision to adopt the innovation or reject it | Preparation | Speed problems | The participant has found speed to be a problem in the online learning tool indicating that there were no other major issues when using the innovation. |
| Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful, 4 =quite useful, 5 =very useful | **Stage 4:** Putting the new technology into practice after accepting it. | Mechanical | Discussion forums: 4 E-messages: 4 Notice board: 4 Online classroom: 4 Online assessment submission:4 Online assessment allocation/reallocation: 4 Online marking: 4 Online return of assessments: 4 Grade book: 0 | The individual successfully uses the features of the online learning tool. The average rating by this participant is 3.5 which is much higher than average indicating that the participant |

				finds the features useful to a high extent.
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Equally positive and negative impacts	The participant has found the impacts equally positive and negative.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 6 (SP6) in the survey. SP6 is a female in the age group of 31 - 40 from the Academic department. SP6 has a computer skill rating of 8 out of 10. The participant uses the online learning tool and has experienced very little change in responsibilities due to the introduction of the online learning tool thus indicating that the orientation stage could have been easier for this participant. The participant has found that the speed to be an issue when using the online learning tool. The participant finds the features of the online learning tool to be quite useful based on an average rating of 3.5 for the features. This participant found the impacts to be equally positive and negative.

Survey Participant 7 (SP7)

Demographic Information
Age: 31 - 40
Gender: Male
Department: Academic
Computer Skills: 8
Hours on the computer each day: 4 – 6 hours

Survey Question	Stage in IDT	Stage in Level of Use	Response	Description of Level of Use based on response
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Much change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced much change.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Adapting to new IT skills	The participant is required to learn new IT skills to use the online learning tool. This indicates that the user took a longer time to adapt to the innovation
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful, 4 =quite useful, 5 =very useful	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 4 E-messages: 4 Notice board: 3 Online classroom: 5 Online assessment submission:5 Online assessment allocation/reallocation: 5 Online marking: 3 Online return of assessments: 5 Grade book: 4	The individual successfully uses the features of the online learning tool. The average rating by this participant is 4.0 which indicate that the participant finds the features useful

				to a high extent.
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Mainly positive impacts	The participant has found the impacts to be mainly positive.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 7 (SP7) in the survey. SP7 is a male in the age group of 31 - 40 from the Academic department. SP7 has a computer skill rating of 8 out of 10. This participant uses the online learning tool and has experienced change in responsibilities due to the introduction of the online learning tool. This indicates that the orientation stage would have taken longer for this participant. The participant had to adapt to new IT skills to use the online learning tool. The participant finds the features of the online learning tool to be highly useful based on an average rating of 4.0 for the features. This participant found the impacts to be mainly positive.

Survey Participant 8 (SP8)

Demographic Information				
Age: 31 - 40				
Gender: Female				
Department: Administration				
Computer Skills: 8				
Hours on the computer each day: More than 8 hours a day				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Total change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced total change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Some usability issues	The participant had usability issues with the online learning tool.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 4 E-messages: 3 Notice board: 3 Online classroom: 5 Online assessment submission:5 Online assessment allocation/reallocation: 4 Online marking: 2 Online return of assessments: 4	The individual successfully uses the features of the online learning tool. The average rating by this participant is 4.0 which indicate that the participant

4 =quite useful, 5 =very useful			Grade book: 4	finds the features useful to a high extent.
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Mainly positive impacts	The participant has found the impacts to be mainly positive.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 8 (SP8) in the survey. SP8 is a female in the age group of 31 - 40 from the Administration department. SP8 has a computer skill rating of 8 out of 10. The participant uses the online learning tool and has experienced a total change in responsibilities due to the introduction of the online learning tool. This indicates that the orientation stage could have taken longer for this participant. The participant had some usability issues with the online learning tool indicating that the participant might not have found the tool to be user friendly. The participant finds the features of the online learning tool to be highly useful based on an average rating of 4.0 for the features. This participant found the impacts to be mainly positive.

Survey Participant 9 (SP9)

Demographic Information				
Age: less than 31				
Gender: Male				
Department: IT				
Computer Skills: 8				
Hours on the computer each day: More than 8 hours a day				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a	Non-use	Yes	The participant uses the online learning tool (the innovation)

	new technology			
What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	No change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced no change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Speed problems	The participant has found speed to be a problem in the online learning tool indicating that there were no other major issues when using the innovation.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 4 E-messages: 3 Notice board: 3 Online classroom: 5 Online assessment submission:4 Online assessment allocation/reallocation: 3 Online marking: 3 Online return of assessments: 3	The individual uses the features of the online learning tool to quite an extent and has given an average rating of 3.0.

Survey Question	Stage in IDT	Stage in Level of Use	Response	Description of Level of Use based on response
4 =quite useful, 5 =very useful			Grade book: 2	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Mainly positive impacts	The participant has found the impacts to be mainly positive.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 9 (SP9) in the survey. SP9 is a male less than 31 in age from the IT department. SP9 has a computer skill rating of 8 out of 10. The participant uses the online learning tool. It is interesting to note that the participant has not experienced any change in responsibilities thus indicating that the participant would have had a smooth orientation stage. The participant has found speed to be an issue when using the online learning tool. The participant finds the features of the online learning tool to be quite useful based on an average rating of 3.0 for the features. This participant found the impacts to be mainly positive.

Survey Participant 10 (SP10)

Demographic Information				
Age: less than 31				
Gender: Female				
Department: Academic				
Computer Skills: 7				
Hours on the computer each day: 4 – 6 hours				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Minimal change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced no change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Speed problems	The participant has found speed to be a problem in the online learning tool indicating that there were no other major issues when using the innovation.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful, 4 =quite useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 4 E-messages: 4 Notice board: 4 Online classroom: 3 Online assessment submission:2 Online assessment allocation/reallocation: 4 Online marking: 4 Online return of assessments: 4 Grade book: 4	The individual successfully uses the features of the online learning tool. The average rating by this participant is 4.0 which indicate that the participant finds the features

5 =very useful					useful to a high extent.
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine		Equally positive and negative impacts	The participant has found the impacts to be both positive and negative.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 10 (SP10) in the survey. SP10 is a female less than 31 in age from the Academic department. SP10 has a computer skill rating of 7 out of 10. The participant uses the online learning tool. The participant has experienced minimal change during the orientation phase of the online learning tool. This indicates that the participant would have not taken long to adapt to the changes. The participant has found speed to be an issue when using the online learning tool. The participant finds the features of the online learning tool to be highly useful based on an average rating of 4.0 for the features. This participant found the impacts to be both positive and negative.

Survey Participant 11 (SP11)

Demographic Information				
Age: 41 - 50				
Gender: Female				
Department: Academic				
Computer Skills: 7				
Hours on the computer each day: More than 8 hours a day				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Much change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced much change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Speed problems	The participant has found speed to be a problem in the online learning tool indicating that there were no other major issues when using the innovation.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 2 E-messages: 4 Notice board: 2 Online classroom: 4 Online assessment submission:5 Online assessment allocation/reallocation: 4 Online marking: 3 Online return of	The participant does not find all the features of the online learning tool to be useful and has given an average rating of 1.5.

useful, 4 =quite useful, 5 =very useful			assessments: 3 Grade book: 1	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Equally positive and negative impacts	The participant has found the impacts to be both positive and negative.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 11 (SP11) in the survey. SP11 is a female in age group of 41 – 50 from the Academic department. SP11 has a computer skill rating of 7 out of 10. The participant uses the online learning tool. The participant has experienced quite a big change during the orientation phase of the online learning tool. This indicates that the participant would have taken long to adapt to the changes. The participant has found speed to be an issue when using the online learning tool. The participant finds the features of the online learning tool to be slightly useful based on an average rating of 1.5 for the features. This participant found the impacts to be both positive and negative.

Survey Participant 12 (SP12)

Demographic Information				
Age: 31 - 40 Gender: Female Department: IT Computer Skills: 10 Hours on the computer each day: More than 8 hours a day				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a	Non-use	Yes	The participant uses the online learning tool (the innovation)

	new technology			
What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Much change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced much change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Speed problems	The participant has found speed to be a problem in the online learning tool indicating that there were no other major issues when using the innovation.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 5 E-messages: 5 Notice board: 5 Online classroom: 5 Online assessment submission:5 Online assessment allocation/reallocation: 5 Online marking: 5 Online return of assessments: 5	The participant finds all the features extremely useful giving each of the features a rating of 5.

4 =quite useful, 5 =very useful			Grade book: 5	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Totally positive impacts	The participant has found the impacts to totally positive.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 12 (SP12) in the survey. SP12 is a female in age group of 31 – 40 from the IT department. SP12 has a computer skill rating of 7 out of 10. The participant uses the online learning tool. The participant has experienced quite a big change during the orientation phase of the online learning tool. Based on this it can be assumed that the participant would have taken long to adapt to the changes, but based on the rating of each feature of the online learning tool, the participant has used all the features and has experienced the usefulness of the same. The participant has found speed to be an issue when using the online learning tool. This participant found the impacts to be very positive.

Survey Participant 13 (SP13)

Demographic Information
Age: 31 - 40
Gender: Male
Department: Academic
Computer Skills: 8
Hours on the computer each day: More than 8 hours a day

Survey Question	Stage in IDT	Stage in Level of Use	Response	Description of Level of Use based on response
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Total change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced a total change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Speed problems; Problems working with other software in the online learning tool; Adapting to new IT skills	The participant has experienced quite a few issues when using the online learning tool.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful, 4 =quite useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 5 E-messages: 5 Notice board: 5 Online classroom: 5 Online assessment submission:5 Online assessment allocation/reallocation: 5 Online marking: 5 Online return of assessments: 5 Grade book: 5	The participant finds all the features extremely useful giving each of the features a rating of 5.

5 =very useful				
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Totally positive impacts	The participant has found the impacts to be totally positive

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 13 (SP13) in the survey. SP13 is a male in age group of 31 – 40 from the Academic department. SP12 has a computer skill rating of 8 out of 10.The participant uses the online learning tool. The participant has experienced quite a total change in responsibilities during the orientation phase of the online learning tool. Based on this it can be assumed that the participant would have taken longer to adapt to the changes, but based on the rating of each feature of the online learning tool, the participant has used all the features and has experienced the usefulness of these and given each feature the highest rating of usefulness. The participant has experienced a few issues when using the online learning tool. This is the only participant that has experienced a high number of issues ranging from learning a new skill to using the features and other software on the online learning tool. In spite of the total change, the participant has found the impacts to be totally positive.

Survey Participant 14 (SP14)

Demographic Information				
Age: less than 31				
Gender: Female				
Department: IT				
Computer Skills: 9				
Hours on the computer each day: More than 8 hours a day				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a	Non-use	Yes	The participant uses the online learning tool (the innovation)

	new technology			
What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Minimal change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced a minor change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Adapting to new IT skills	The participant is required to learn new IT skills to use the online learning tool. This indicates that the user took a longer time to adapt to the innovation
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 5 E-messages: 5 Notice board: 5 Online classroom: 5 Online assessment submission:5 Online assessment allocation/reallocation: 5 Online marking: 5 Online return of assessments: 5	The participant finds all the features extremely useful giving each of the features a rating of 5.

			Grade book: 5	
4 =quite useful, 5 =very useful			Grade book: 5	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Equally positive and negative impacts	The participant has found the impacts to be both positive and negative.

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 14 (SP14) in the survey. SP14 is a female in less than 31 in age from the IT department. SP14 has a computer skill rating of 9 out of 10.The participant uses the online learning tool. The participant has experienced minimal change in responsibilities during the orientation phase of the online learning tool. Based on this it can be assumed that the participant would have not taken long to adapt to the changes. The participant has used all the features and has experienced the usefulness of the same and given them each the highest rating of usefulness. The participant has been required to adapt to new IT skills to use the online learning tool. The participant has found the impacts to be equally positive and negative.

Survey Participant 15 (SP15)

Demographic Information				
Age: less than 31				
Gender: Male				
Department: IT				
Computer Skills: 8				
Hours on the computer each day: More than 8 hours a day				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Total change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced a total change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Speed problems	The participant has found speed to be a problem in the online learning tool indicating that there were no other major issues when using the innovation.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful, 4 =quite useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 4 E-messages: 4 Notice board: 2 Online classroom: 5 Online assessment submission:5 Online assessment allocation/reallocation: 5 Online marking: 5 Online return of assessments: 5 Grade book: 3	The participant finds all the features useful and has given an average rating of 3.5.

5 =very useful				
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Totally positive impacts	The participant has found the impacts to be totally positive

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 15 (SP15) in the survey. SP15 is a male in less than 31 in age from the IT department. SP15 has a computer skill rating of 8 out of 10.The participant uses the online learning tool. The participant has experienced total change in responsibilities during the orientation phase of the online learning tool. Based on this it can be assumed that the participant would have taken long to adapt to the changes. The participant has used all the features and has found some features to be extremely useful. The participant has found speed to be an issue when using the online learning tool. The participant has found the impacts to be totally positive.

<u>**Survey Participant 16 (SP16)**</u>

Demographic Information				
Age: 31 - 40				
Gender: Male				
Department: Academic				
Computer Skills: 7				
Hours on the computer each day: 6 - 8 hours				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use	Yes	The participant uses the online learning tool (the innovation)

What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Much change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced much change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation	Speed problems Lack of connectivity Could engage in collaborative learning. Students studying in the classroom should also have access to ecelearn/NZTC Online in order to generate learning communities.	The participant has found speed to be one of the issues of the online learning tool. There are other useful feedbacks that this participant has pointed out as well.
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 5 E-messages: 5 Notice board: 2 Online classroom: 2 Online assessment submission:4 Online assessment allocation/reallocation: 0 Online marking: 5 Online return of assessments: 0	The participant finds all the features to be quite useful and has given an average rating of 2.5.

4 =quite useful, 5 =very useful			Grade book: 0	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Mainly positive impacts	The participant has found the impacts to be mainly positive

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 16 (SP16) in the survey. SP16 is a male in the age group of 31 - 40 from the Academic department. SP16 has a computer skill rating of seven out of 10.The participant uses the online learning tool. The participant has experienced much change in responsibilities during the orientation phase of the online learning tool. Based on this it can be assumed that the participant would have taken long to adapt to the changes. The participant has used all the features and has found some features to be extremely useful. The participant has found speed to be an issue when using the online learning tool. Apart from this, the participant has also mentioned other issues with the online learning tool and how they can be improved. This indicates that the participant has a higher understanding of how the online learning tool works and how it can be improved. The participant has found the impacts to be totally positive.

Survey Participant 17 (SP17)

Demographic Information				
Age: less than 31				
Gender: Male				
Department: IT				
Computer Skills: 8				
Hours on the computer each day: More than 8 hours a day				
Survey Question	**Stage in IDT**	**Stage in Level of Use**	**Response**	**Description of Level of Use based on response**
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about	Non-use	Yes	The participant uses the online learning tool (the innovation)

	a new technology			
What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Total change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced a total change in responsibilities.
What IT related problems have you faced while using the online learning tool?

Are the IT related problems you face while using ecelearn at home? | **Stage 3:** The decision to adopt the innovation or reject it | Preparation | Problems working with other software in the online learning tool Also speed problems | The participant has found lack of speed and working with other software to be issues of the online learning tool. |
| Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately | **Stage 4:** Putting the new technology into practice after accepting it. | Mechanical | Discussion forums: 5 E-messages: 3 Notice board: 5 Online classroom: 5 Online assessment submission:5 Online assessment allocation/reallocation: 5 Online marking: 5 Online return of | The participant finds all the features to be highly useful and has given an average rating of 4.0. |

			assessments: 5 Grade book: 3	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Totally positive impacts	The participant has found the impacts to be totally positive
1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 17 (SP17) in the survey. SP17 is a male less than 31 in age from the IT department. SP17 has a computer skill rating of 8 out of 10.The participant uses the online learning tool. The participant has experienced much change in responsibilities during the orientation phase of the online learning tool. Based on this it can be assumed that the participant would have taken long to adapt to the changes. The participant has used all the features and has found some features to be extremely useful. The participant has found speed to be an issue when using the online learning tool. Apart from this, the participant has also mentioned working with other software in the online learning tool to be an issue. The participant has found the impacts to be totally positive.

Survey Participant 18 (SP18)

Demographic Information
Age: less than 31
Gender: Female
Department: Enrolments
Computer Skills: 8
Hours on the computer each day: 6 – 8 hours

Survey Question	Stage in IDT	Stage in Level of Use	Response	Description of Level of Use based on response
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a	Non-use	Yes	The participant uses the online learning tool (the

	new technology			innovation)
What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation	Much change	During the orientation of the innovation where the participant comes to know of the changes involved, the participant has experienced much change in responsibilities.
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation		No issue mentioned by this participant
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful,	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical	Discussion forums: 5 E-messages: 4 Notice board: 4 Online classroom: 4 Online assessment submission:5 Online assessment allocation/reallocation: 4 Online marking: 4	The participant finds all the features to be highly useful and has given an average rating of 4.5

3 =moderately useful, 4 =quite useful, 5 =very useful			Online return of assessments: 5 Grade book: 4	
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine	Mainly positive impacts	The participant has found the impacts to be mainly positive

1	2	3	4	5	6	7	8	9	10

The above table gives us a picture of the responses provided by Participant 18 (SP18) in the survey. SP18 is a female less than 31 in age from the Enrolments department. SP17 has a computer skill rating of 8 out of 10.The participant uses the online learning tool. The participant has experienced much change in responsibilities during the orientation phase of the online learning tool. Based on this it can be assumed that the participant would have taken long to adapt to the changes. The participant has used all the features and has found some features to be extremely useful. The participant has not indicated any issues experienced when using the online learning tool. The participant has found the impacts to be mainly positive.

4.10   Summary of survey analysis:

	Demographic Information	Stage 1/ Non–use	Stage 2/ Orientation	Stage 3/ Preparation	Stage 4/ Mechanical	Stage 5/ Routine
SP1	Age: 31 – 40 Gender: Male Depart: IT Computer Skills: 8					
SP2	Age: < 31 Gender: Male Depart: IT Computer Skills: 10					
SP3	Age: 41 - 50 Gender: Female Depart: Academic					

	Computer Skills: 5					
SP4	Age: 41 - 50 Gender: Female Depart: Academic Computer Skills: 7					
SP5	Age: 41 - 50 Gender: Female Depart: Academic Computer Skills: 5					
SP6	Age: 31 - 40 Gender: Female Depart: Academic Computer Skills: 8					
SP7	Age: 31 - 40 Gender: Male Depart: Academic Computer Skills: 8					
SP8	Gender: Female Depart: Admin Computer Skills: 8					
SP9	Age: less than 31 Gender: Male Depart: IT Computer Skills: 8					
SP10	Age: less than 31 Gender: Female Depart: Academic Computer Skills: 7					
SP11	Age: 41 - 50 Gender: Female Depart: Academic Computer Skills: 7					
SP12	Age: 31 - 40 Gender: Female Department: IT Computer Skills: 10					
SP13	Age: 31 - 40 Gender: Male Depart: Academic Computer Skills: 8					

SP14	Age: < 31 Gender: Female Department: IT Computer Skills: 9	10	7	5	10	5
SP15	Age: < 31 Gender: Male Department: IT Computer Skills: 8	10	1	8	7	10
SP16	Age: 31 - 40 Gender: Male Depart: Academic Computer Skills: 7	10	4	8	5	8
SP17	Age: < 31 Gender: Male Department: IT Computer Skills: 8	10	1	7	8	10
SP18	Age: < 31 Gender: Female Depart: Enrolments Computer Skills: 8	10	4	1	9	8

1	2	3	4	5	6	7	8	9	10

Table 4.7: Summary of survey analysis

Eighteen participants took part in the survey. Ten participants were females and eight were males. We will refer to the participants with age <31 as the "younger group", those with ages 31 to 40 as the "middle group" and those with ages 41 to 50 as the "older group".
The following patterns emerge in each stage based on the table above.

Stage 1:

- All participants use the online learning tool
- The older group are all female and are all from the Academic department
- The younger group are mostly male from the IT department
- The older group rate their IT skills lower than the middle and younger groups
- The male participants rate their computer skills on average higher than the female participants do.

    The average rating of computer skills for males is 8.1 and for females is 7.4

- Academic staff members rate their computer skills lower (mean of 6.9) than staff members from the other departments (Administration staff member mean of 8; Enrolment staff member mean of 8; IT staff mean of 8.7). IT staff members have rated their computer skills the highest (mean of 8.7).

Stage 2:
- Staff members with higher computer skills have experienced a greater change than staff members with lower computer skills
- Male participants seemed to have experienced more changes due to the introduction of online learning tool than the female participants.

Stage 3:
- Participants who spend more hours on the computer found only speed to be an issue in the online learning tool
- Participants with higher computer skills found only speed to be a major issue in the online learning tool
- IT staff members mostly found speed to be an issue with the online learning tool.

Stage 4:
- The younger group rate the features of the online learning tool higher than the middle and younger groups
- Female participants rate the features of the online learning tool slightly higher than the male participants
- Participants with higher rating of computer skills rate the features of the online learning tool higher than participants with lower rating of computer skills
- Participants who spend longer hours on the computer rate the features of the online learning tool higher than participants who spend lesser time on the computers.

Stage 5:
- Staff members with higher computer skills have found the impact of introducing online learning more positive
- The younger group find the impacts of introducing online learning more positive than the middle and the younger group
- Male participants find that the impact of introducing online learning is more positive than the female participants

- The IT staff members find the impacts of introducing online learning more positive than staff members from the other departments.

4.11 Analysis of interview data

The interview questions aimed to get an in depth knowledge of how the users adapted to the online learning tool hence all stages of LoU have been used to analyse the interview responses.

Interview: IT trainer 1

Interview Questions	Stage in IDT	Stage in Level of Use	Response	Description of Stage
1. What was your initial reaction to the introduction of the online learning tool at organisation X?	Stage 1: The first time the individual knows about a new technology	Non-use	opportunity; area of interest; growing area; excited;	The participant was very excited and saw this as an opportunity as online learning is a growing area.
2. What kind of training was provided before the online learning tool was introduced?	Stage 2: The period during which the individual gets to know the basic features of the new technology	Orientation	WEDL Project; self explore functionality and navigation training online pedagogy; Professional development; No IT input; Initially leader communicated with IT;	The participant was involved in a pilot project where they had an opportunity to self explore and also to undergo training on functionality and navigation. There was no training from IT at this point
5. What were	Stage 3:	Preparation	Big changes;	The participant

the changes to the responsibilities in your role due to the introduction of the online learning tool?	The decision to adopt the innovation or reject it		Senior lecturer; Supervisory; train lecturers; conduct PD; personal; professional	took on a senior role to prepare for the changes due to the online learning tool.
6. How have the changes due to the online learning tool impacted you? 8. How did you train staff? 10. What are common technical problems that you face encounter while using the online learning tool? 11. What difference did you notice between training a person experienced in using online learning tools and training a person new to	Stage 4: Putting the new technology into practice after accepting it.	Mechanical Routine	All levels; professional; promotion; own studies; ongoing; presentation; PD sessions; research seminar; training program; orientation PD site; familiarise online marking; discussion forum; student part; lecturer part; Logins confused; slow internet; rigid features linked; much quicker; better understanding; retain longer; slow	The participant successfully implements the online learning tool and is confident in providing training to all other staff. The participant is able to understand the problems that the users face and solve them.

online learning?			not drawing much;	
14. What features of online learning do you like the most and why? 15. What features of online learning do you not like and why? 19, Have you benefited in any way from the introduction of the online learning tool? 20. If given the chance, what would you have changed to implement the online learning tool in a better way?	Stage 5: Period of reflection	Refinement Integration Renewal	learnt many skills professionally socially; new interests; lecturer feedback; collaborating; course design restrictive; formative assessment for feedback;	The participant is a trainer for the online learning tool and is confident in providing training to peers. The participant has reached the renewal stage where he can make suggestions to transform the innovation for the better.

1	2	3	4	5	6	7	8	9	10

Interview: IT trainer 2

Interview Questions	Stage in IDT	Stage in Level of Use	Response	Description of Stage
1. What was your initial reaction to the introduction of the online learning tool at organisation X?	Stage 1: The first time the individual knows about a new technology	Non-use	Tool existed; Looking forward	The online learning tool existed when the participant joined Organisation X. The participant looked forward to using the tool.
2. What kind of training was provided before the online learning tool was introduced?	Stage 2: The period during which the individual gets to know the basic features of the new technology	Orientation	Brief intro; step by step docs;	The participant was given an brief introduction to the features of the online learning tool and step by step documents to study.
5. What were the changes to the responsibilities in your role due to the introduction of the online learning tool?	Stage 3: The decision to adopt the innovation or reject it	Preparation	No change; tool already existed;	The online learning tool was already in use when the participant joined Organisation X, hence did not experience any change in responsibilities.

6. How have the changes due to the online learning tool impacted you? 8. How did you train staff? 10. What are common technical problems that you face encounter while using the online learning tool? 11. What difference did you notice between training a person experienced in using online learning tools and training a person new to online learning?	Stage 4: Putting the new technology into practice after accepting it.	Mechanical Routine	No impact brief intro; PD site; lecturer login; student login; HR setup time on computer; training room projector; not familiar with computers; not up to speed; suggest more functionality; feature works; no questions;	The participant did not experience any impacts or changes. The participant trains staff using the demo site to understand the different roles in the online learning tool and how they work. The participant finds that some staff are not familiar with computers are hence are not up to speed. The participant is able to understand that staff who are experienced in using the online learning tool have different observations to

				those who have not used an online learning tool before.
19, Have you benefited in any way from the introduction of the online learning tool? 20. If given the chance, what would you have changed to implement the online learning tool in a better way?	Stage 5: Period of reflection	Refinement Integration Renewal	Career skills ; experienced on features; promoted ; tester/quality assurance; good thought; gradually adjust;	The participant has benefited from the online learning tool in terms of his career and skills. The participant felt that the online learning tool was introduced with good thought and gradually making it easier for everyone to adjust to the change.

1	2	3	4	5	6	7	8	9	10

Interview: Academic Lecturer 1

Interview Questions	Stage in IDT	Stage in Level of Use	Response	Description of Stage
1. What was your initial reaction to the introduction of the online learning tool at organisation X? 3. Have you used an online learning tool before?	Stage 1: The first time the individual knows about a new technology	Non-use	Very pleased; Work manageable; communicate with students Yes	The participant was very pleased to hear that online learning was going to be introduced. The participant was able to highlight features that he looked forward to in the online learning tool. The participant has used an online learning tool before.
2. What kind of training was provided before the online learning tool was introduced? 16. How have	Stage 2: The period during which the individual gets to know the basic features of the new	Orientation	PD Site; Discussion forum; community building; PP presentation; fairly decent experience; internet use	The participant was trained using the demo site and with PP presentations. The

you adapted yourself to using the online learning tool?	technology		helped; Communication; picked up on the job;	participant found that internet experience helped adapt to the tool faster. The participant had adapted to the online learning tool by picking up a number of skills on the job
5. What were the changes to the responsibilities in your role due to the introduction of the online learning tool?	Stage 3: The decision to adopt the innovation or reject it	Preparation	Not much change; correspondence; talking decreased; marking online;	There were not many changes in this participant's responsibilities.
6. How have the changes due to the online learning tool impacted you? 7. What extra/different skills are needed to work with the online	Stage 4: Putting the new technology into practice after accepting it.	Mechanical Routine	ease of marking; academic skills; effective writing; feedback; format reference; stock phrases; Communication; use sound of text effectively; ask right questions;	The participant has found the online learning tool to be useful in terms marking and in other day to day tasks.

learning tool?			create discussion; major challenge;	
8. What kind of training was provided after the online learning tool was introduced?			PP presentation; academic trainer;	The participant had to learn effective communicatio n skills to communicate with students online.
9. Was constant IT support provided?			IT team support; email, screenshots; Sysaid;	
10. What are common technical problems that you face encounter while using the online learning tool?			Speed; Sluggish; frustrating; glitches ironed out with every release; fairly responsive;	Constant IT support was provided.
				The participant mentioned that there were some speed issues with the online learning tool initially but

				these issues seemed to have been resolved now.
14. What features of online learning do you like the most and why?	Stage 5: Period of reflection	Refinement	Flexibility; connect other technologies; open source technologies;	The participant has reached the renewal stage where he can make suggestions to transform the innovation for the better.
		Integration		
		Renewal	courses restrictive; in terms of research make connection with software and social networking sites; terms of connectivity;	
19, Have you benefited in any way from the introduction of the online learning tool?			work better; mark assignments; better way of teaching; assessment feedback in detail; no need to read handwriting; flexibility to work from home;	The participant was happy with the way the online learning tool was introduced.
20. If given the chance, what would you have changed to implement the online learning tool in a better way?			No changes; happy it was changed;	

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Interview: Academic Lecturer 2

Interview Questions	Stage in IDT	Stage in Level of Use	Response	Description of Stage
1. What was your initial reaction to the introduction of the online learning tool at organisation X? 3. Have you used an online learning tool before?	Stage 1: The first time the individual knows about a new technology	Non-use	Horror; Closed aspect Study guides concerned; Lonely experience; tutor on phone conscientious; no personal communication;	The participant was not happy to hear that the online learning tool was going to be introduced because it would be a lonely experience for students.
2. What kind of training was provided before the online learning tool was introduced? 16. How have you adapted yourself to using the online learning tool?	Stage 2: The period during which the individual gets to know the basic features of the new technology	Orientation	Hap Hazard; trial & error; rushed; Adapted by using the tool everyday;	The participant felt that the training was haphazard and rushed. Hence the participant adapted to the online learning tool by using it everyday

5. What were the changes to the responsibilities in your role due to the introduction of the online learning tool?	Stage 3: The decision to adopt the innovation or reject it	Preparation	Change in direction; more research; marking paper based online;	There were quite a number of changes in this participant's responsibilities.
6. How have the changes due to the online learning tool impacted you? 7. What extra/different skills are needed to work with the online learning tool? 8. What kind of training was provided after the online learning tool was introduced? 9. Was constant IT support provided? 10. What are common technical	Stage 4: Putting the new technology into practice after accepting it.	Mechanical Routine	online marking mucks page; format page; few comments; streamlining; quality dropped; good IT support; IT team good second to none; constant IT support; Function malfunction; turn off system; lose work ; system freeze;	The participant has experience some issues due to online marking in the online learning tool. Constant IT support was provided. The participant has experienced some technical

problems that you face encounter while using the online learning tool?				issues.
14. What features of online learning do you like the most and why? 19, Have you benefited in any way from the introduction of the online learning tool? 20. If given the chance, what would you have changed to implement the online learning tool in a better way?	Stage 5: Period of reflection	Refinement Integration Renewal	System to check script; plagiarism; spelling; grammar; construction of argument; not business model educational model; Research; grasp potential of online; learning communities; theory to fruition; More people involved; lack of proper communication; build community of learners; educational product; need for open ended engagement;	The participant has explained some features that will be good to have in the online learning tool. The participant was not very happy with the way the online learning tool was introduced because of lack of communication.

1	2	3	4	5	6	7	8	9	10

Interview: Admin 1

Interview Questions	Stage in IDT	Stage in Level of Use	Response	Description of Stage
1. What was your initial reaction to the introduction of the online learning tool at organisation X? 3. Have you used an online learning tool before?	Stage 1: The first time the individual knows about a new technology	Non-use	interesting	The participant was interested to hear that the online learning tool was going to be introduced.
2. What kind of training was provided before the online learning tool was introduced?	Stage 2: The period during which the individual gets to know the basic features of the new technology	Orientation	examples on white board from IT;	The participant was given examples on how the features of the online learning would work from the IT team.
16. How have you adapted yourself to using the online learning tool?	Stage 3: The decision to adopt the innovation or reject it	Preparation	Develop own system/ method; fit online & paper based timeframes; plan work load;	There participant has adapted to the online learning tool by developing methods for various

				tasks.
6. How have the changes due to the online learning tool impacted you? 7. What extra/different skills are needed to work with the online learning tool? 9. Was constant IT support provided? 10. What are common technical problems that you face encounter while using the online learning tool?	Stage 4: Putting the new technology into practice after accepting it.	Mechanical Routine	Double entry steps easy to follow; computers second nature; Yes; Email; face to face; Phone; IT repairs; maintenance; wait till system is back online; speed;	Changes due to the online learning tool have impacted the participant because online tasks as well as paper based tasks are still being carried out. The participant did not need to learn any new skills as the steps were easy to follow. Constant IT support was provided. The

				participant has experienced some technical issues.
20. If given the chance, what would you have changed to implement the online learning tool in a better way?	Stage 5: Period of reflection	Refinement Integration Renewal	none; our point of view not background; learning curve;	The participant would not change anything about the way online learning tool was introduced as the participant does not understand the whole picture. The participant is positive and takes the whole experience as a learning curve.
1	2	3	4	5	6	7	8	9	10

Interview: Admin 2

Interview Questions	Stage in IDT	Stage in Level of Use	Response	Description of Stage
1. What was your initial reaction to the introduction of the online learning tool at organisation X? 3. Have you used an online learning tool before?	Stage 1: The first time the individual knows about a new technology	Non-use	interesting	The participant was interested to hear that the online learning tool was going to be introduced.
2. What kind of training was provided before the online learning tool was introduced?	Stage 2: The period during which the individual gets to know the basic features of the new technology	Orientation	pilot project for 6 months; questions and answers;	The participant was involved in the pilot project and hence was able to understand the way the system works.
16. How have you adapted yourself to using the online learning tool?	Stage 3: The decision to adopt the innovation or reject it	Preparation	Different systems for tracking;	There participant has adapted to the online learning tool by developing methods for various tasks.
6. How have the changes due to the	Stage 4: Putting the new	Mechanical Routine	initial impact; paper based different;	Changes due to the online learning tool

online learning tool impacted you? 7. What extra/different skills are needed to work with the online learning tool? 9. Was constant IT support provided? 10. What are common technical problems that you face encounter while using the online learning tool?	technology into practice after accepting it.		harder double entry; develop own system tracking; IT support by telephone, emails one to one and Sysaid; Not able to submit assessments; PDF resolved;	have impacted the participant because online tasks as well as paper based tasks are still being carried out. The participant did not need to learn any new skills but had to develop own methods of tracking. Constant IT support was provided. The participant has experienced some technical issues where initially assessments could not be submitted online. These issues have been resolved

Interview Questions	Stage in IDT	Stage in Level of Use	Response	Description of Stage
				now.
20. If given the chance, what would you have changed to implement the online learning tool in a better way?	Stage 5: Period of reflection	Refinement Integration Renewal	communication; suggestion;	The participant felt that it would have been better if communication lines were more open to welcome suggestions.
1	2	3	4	5	6	7	8	9	10

Interview: IT Support

Interview Questions	Stage in IDT	Stage in Level of Use	Response	Description of Stage
1. What was your initial reaction to the introduction of the online learning tool at organisation X?

3. Have you used an online learning tool before? | Stage 1: The first time the individual knows about a new technology | Non-use | Good opportunity; excited; sophisticated tool; | The participant felt that it was a good opportunity to be providing support for such a sophisticated tool. |
| 2. What kind of training was provided before the online learning tool was introduced? | Stage 2: The period during which the individual gets to know the basic features of the new | Orientation | case by case; situation by situation; overall understanding; problems gave more knowledge & understanding; | The participant was in an extensive training process using cases and |

	technology		self learning; IT staff trained modules sections;	situations and with training sessions for modules and sections.
4. What were the changes to your responsibilities in your role after the online learning tool was introduced?	Stage 3: The decision to adopt the innovation or reject it	Preparation	Change in the way enrolments and student logins were created; email login details; gradually responsibilities transferred;	There participant has experienced much change due to the introduction of the online learning tool.
6. How have the changes due to the online learning tool impacted you? 9. What type of IT support do you provide for staff? 10. What modes of communication do you used for IT support?	Stage 4: Putting the new technology into practice after accepting it.	Mechanical Routine	High; added responsibility; manage time; accommodate; minimal human error; tough challenge; system admin; fix computer problems; upgrading software Email; face to face; Phone; server migration;	These changes have had a high impact on the participant, as there have been changes to the way tasks were carried out along with added responsibilities.

			install new software; marking freezing; queries; upgrading; computer features;	The participant provides constant IT support, helpdesk for the online learning tool and system admin resolution for all staff through email, phone and face to face.
10. What are common technical problems that you face encounter while using the online learning tool?				
				The participant has experienced some technical issues with the online learning tool.
20. If given the chance, what would you have	Stage 5: Period of reflection	Refinement Integration Renewal	could be more detailed; learn myself	The participant is at a stage

changed to implement the online learning tool in a better way?				through mistakes; no full training; more responsibilities; gradual training;	to provide valuable feedback about the way the tool was introduced. The participant feels that more training could have been provided.

1	2	3	4	5	6	7	8	9	10

4.12 Summary of Interview analysis

Participant	Stage 1 / Non – use	Stage 2 / Orientation	Stage 3 / Preparation	Stage 4 / Mechanical	Stage 5 / Routine
IT trainer 1					
IT trainer 2					
Lecturer 1					
Lecturer 2					
Admin 1					
Admin 2					
IT support					

1	2	3	4	5	6	7	8	9	10

Table 4.8: Summary of interview analysis

Colour coding: The intensity of colours shows the rating progressing from 1-10.

1 being the lightest colour and 10 being the brightest signifying the maximum possible score.

Seven participants from across all departments were interviewed. The following patterns emerge in each stage based on the table above.

Stage 1:
- Younger male participants were really excited about the introduction of the online learning tool compared to older males or female participants
- Participants from the IT department were more excited about the change than staff members from other departments
- The older male participant was not happy that online learning was going to be introduced
- Female participants were interested that online learning tool was going to be introduced.

Stage 2:
- IT trainer 1 was the most prepared for the orientation stage as he had participated in the pilot project
- Lecturer 2 was not prepared for the online learning tool in stage 1 and hence found the orientation stage difficult as well
- Administration staff members have experienced relatively more change than staff members from other departments.

Stage 3:
- Administration staff members seem to be more prepared for the change than staff members from other departments.

Stage 4:
- Younger male participants have adapted to the tool faster than staff members from other departments.

Stage 5:
- Younger male participants have provided valuable feedback on how implementation of online learning can be improved compared to other staff members.

4.13 Triangulation

Triangulation was used to analyse the agreement and disagreement between the survey and interview results.

Agreement between survey and interview results

Stage	Agreement between survey and interview results
Stage 1	Both the survey and interview results show that younger participants are mostly men from the IT department
Stage 2	Both the survey and the interview results show that IT staff seemed to have experienced more change than other staff members
Stage 3	No common results
Stage 4	From the survey results, the younger group, which are mostly male, rate the features of the online learning tool higher than the middle and younger groups. This analysis was also obtained in the interview results where it shows that the younger male participants have adapted faster to the online learning tool.
Stage 5	Both the survey and interview results show that younger male participants have found the impacts of the online learning tool more positive and have provided valuable feedback on how the implementation of the online learning can be improved.

Table 4.9: Agreement of survey and interview results

The triangulation for the agreement of results show that younger participants are mostly male from the IT department and IT staff members have experienced more change due to the online learning tool than other staff members. Both the interview and the survey results show that male participants seem to rate the features of the online learning tool higher. In the

reflection stage, it is noticed that the younger male participants have found the impacts of the online learning tool more positive and have provided valuable feedback.

Disagreement between survey and interview results

Stage	Disagreement between survey and interview results
Stage 1	No disagreement in results
Stage 2	The survey results show that staff from the IT department have experienced more change whereas the interview results show that the administration staff have experienced more change
Stage 3	The survey results show that male participants seemed to have experienced more changes due to the introduction of online learning tool than female participants have, but the interview results show that administration staff has experienced relatively more change than staff from other departments.
Stage 4	No disagreement in results
Stage 5	No disagreement in results

Table 4.10: Disagreement of survey and interview results

From the table above for the triangulation for disagreement of survey and interview results, it was noticed, that there is not much disagreement between the results. The only disagreements are in stage 2 and 3. The survey shows that IT staff members have experienced more change whereas the interview results show that the administration staff members have experienced more change. This could be due to the fact that both the teams were involved in with the online learning tool to a great extent. Both the administration staff members were involved in the pilot WEDL project and experienced a great change when the tool was introduced. The IT staff members might have felt that they experienced more change because they had to learn how to use the tool as well as train others to use the tool. The disagreement in the results could be because the survey aimed to get a high level response from the user and the interview to get an in depth response from the participant and hence the difference in responses.

4.14 Conclusion

The data gathered from the participants have been analysed in the current chapter and further discussions are presented along with the research question in the next chapter.

CHAPTER 5: DISCUSSION

5.1 Introduction

The main aim of this study was to find the impacts, changes, and technical issues that arise when an online learning tool is introduced into a tertiary educational organisation. In this chapter, the research findings were analysed with reference to the customised theoretical model Change Adaption Model (CAM) and literature in this area. Research findings were related to the literature to identify similarities and differences.

5.2 Mapping Theory to the customised Model

Straub's paper "Understanding technology adoption theory and future directions for Informal learning" (2009) was studied to derive a customised model Change Adaption Model (CAM) that was used for the data analysis.

Straub's paper was studied and the discussion on all the theoretical models was analysed to decide what model would suit the analysis for this study. Rogers's IDT, Concerns-Based Adoption Model (CBAM), Technology Acceptance Model (TAM), and the United Theory of Acceptance and Use of Technology (UTAUT) models were studied. After analysis, Roger's IDT and CBAM models seemed most appropriate to use. Rogers's IDT theory and CBAM's Level of Use (LoU) model were studied to derive the customised model CAM. According to Straub (2009), Rogers's IDT theory of innovation diffusion provides a foundational understanding of adoption theories and has been used widely across many disciplines to understand change due to technology. Straub opines that although Rogers's theory is a critical foundation, it is not easy to understand the adoption process. Hence, the different adoption theories such as the Concerns-Based Adoption Model, the Technology Acceptance Model, and the United Theory of Acceptance and Use of Technology were studied to decide on which theoretical model/models could be used for this study. Based on the explanation of these models, a decision was made to use both Rogers's theory and CBAM theory to develop a customised model CAM.

These two models were chosen for the following reasons:
Roger's IDT theory explains adoption decision by an individual to an innovation as a five-stage process. When comparing the five stages with the questions and responses of the participants, it became apparent how the closely the questions could be grouped into the five stages of Roger's IDT model. The IDT theory, defines five stages that start from the point where the individual comes to know about the technology to the point where they have accepted or rejected the innovation and can reflect upon the entire diffusion process. The

questions in the survey and interview can be divided into phases, which aimed to find how the participant felt when they came to know about the online learning tool, what changes they faced, how they adapted to the change and their reflection on the entire process. The different phases of questions, were very similar to IDT's five-stage process, hence the mapping was done.

The survey questions were mapped to Roger's five-stage process as follows:

Survey Question	Stage in IDT	Stage in Level of Use
Have you used the online learning tool ecelearn?	**Stage 1:** The first time the individual knows about a new technology	Non-use
What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?	**Stage 2:** The period during which the individual gets to know the basic features of the new technology	Orientation
What IT related problems have you faced while using the online learning tool? Are the IT related problems you face while using ecelearn at home?	**Stage 3:** The decision to adopt the innovation or reject it	Preparation
Please rate each of the following learning tools using a five point scale 0 =never used, 1 =not useful, 2 =slightly useful, 3 =moderately useful, 4 =quite useful, 5 =very useful	**Stage 4:** Putting the new technology into practice after accepting it.	Mechanical
What are the impacts of introducing an online learning tool?	**Stage 5:** Period of reflection	Routine

1	2	3	4	5	6	7	8	9	10

Table 5.1: CAM for the survey

Colour coding: The intensity of colours shows the rating progressing from 1-10. 1 being the lightest colour and 10 being the brightest signifying the maximum possible score.

As shown in table 1 above, the question in stage 1 aimed at getting to know the individual's reaction to the introduction of the online learning tool. Stage 2 is the period when the individual gets to know about the basic features hence the questions asked at this stage were to understand the changes in the individuals role when getting to know how to use the system. Stage 3 is critical, as it is a decision stage when the individual decides whether they want to use the technology or not. The questions mapped to stage 3 were more in depth to find out the user's experience with the online learning tool and the problems that they faced when using the system. The responses to these questions helped determine if the user felt positively or negatively towards the online learning tool. Stage 4 is putting the technology to use and the users were asked to rate the different features of the online learning tool. Finally, to facilitate the period of reflection, the users were asked about the impacts they faced due to the introduction of the online learning tool.

The interview questions were more in depth and aimed to get a more detailed answer to the questions. The interview questions were mapped to the Roger's five-stage process as follows:

Interview Questions	Stage in IDT	Stage in Level of Use
What was your initial reaction to the introduction of the online learning tool at organisation X? Have you used an online learning tool before?	Stage 1: The first time the individual knows about a new technology	Nonuse
What kind of training was provided before the online learning tool was introduced? How have you adapted yourself to using the online learning tool?	Stage 2: The period during which the individual gets to know the basic features of the new technology	Orientation
What were the changes to the responsibilities in your role due to the introduction of the online	Stage 3: The decision to adopt the innovation or reject it	Preparation

learning tool?		
How have the changes due to the online learning tool impacted you? What extra/different skills are needed to work with the online learning tool? How did you train staff? What are common technical problems that you face encounter while using the online learning tool? What difference did you notice between training a person experienced in using online learning tools and training a person new to online learning? What kind of training was provided after the online learning tool was introduced?	Stage 4: Putting the new technology into practice after accepting it.	Mechanical
		Routine
What features of online learning do you like the most and why? What features of online learning do you not like and why? Have you benefited in any way from the introduction of the online learning tool?	Stage 5: Period of reflection	Refinement
		Integration
		Renewal

If given the chance, what would you have changed to implement the online learning tool in a better way?		
1	2	3	4	5	6	7	8	9	10

Table 5.2: CAM for the interview

Colour coding: The intensity of colours shows the rating progressing from 1-10. 1 being the lightest colour and 10 being the brightest signifying the maximum possible score.

As shown in table 2 above, the question in stage 1 aimed at getting to know the individual's reaction to the introduction of the online learning tool. Stage 2 is the period when the individual becomes familiar with the basic features. IT training plays an important role in this stage. Hence, questions asked were on how IT training was provided and how staff members adapted to the online learning tool. Questions in stage 3 endeavoured to find out if the user adopted or rejected the online learning tool. Stage 4 is putting the technology to use and the users were asked questions based on their role in Organisation X. Finally, users were asked if they would change the way in which the online learning tool was introduced.

It was not enough to know only about the adoption decision, but also to know how the adoption happened through the eyes of the adoptee. To facilitate this, the Level of Use (LoU) model was used that described behavioural diffusion of an innovation through the LoU scale. LoU breaks down the behavioural action of the individual from the lowest level, which is non-use to the highest level, which is renewal, these levels relate to the questions mapped in CAM. Concerns-Based Adoption's (CBAM) LoU model was used to provide a perspective on how an adoptee's concerns influence the integration of an innovation (Straub, 2009). LoU breaks down the actions of user into categories from non-use at the lowest behavioural implementation to renewal, the highest, indicating a teacher transforming and extending the innovation (Straub, 2009). When examining the current mapping of the survey and interview questions to Roger's IDT model, it was noted that it is important to understand the adoption through the eyes of the user. To allow this, the different levels of LoU were mapped to the survey and interview questions, which were already mapped to Roger's IDT model. The LoU mapping can be viewed in table 1 and 2 above. The different levels in LoU are mapped to the different stages in Roger's IDT model. There is a link between these two models because each of them started at a stage where the user becomes familiar with the innovation and

goes up to the stage where the user is at a level of reflection based on whether they have adapted or rejected the innovation.

A colour coding system was used to rate the responses of the user. The colour coding was used to make the analysis process a little easier in identifying the similarity in response patterns. The colour coding and rating is from 1 – 10 with one being the lowest and 10 being the highest. Positive responses were given a higher rating than a negative or neutral response.

Combining both these models to form the CAM would help the research in understanding the diffusion process based on behavioural actions by individuals.

5.3   Research Findings

The following steps were followed to analyse the obtained results:

Step 1: Questions from the interview and survey were mapped to the respective stages in CAM.

Step 2: Each survey and interview response was mapped to CAM using table 1 above.

Step 3: Each response was then rated on a scale of 1 to 10 and the colour coded. This colour representation helped identify the similarities and differences between the responses.

Step 4: A summary table was then drawn up one each for the survey and interview to see the overall number of similarities and differences in opinions between the individuals.

Step 5: The triangulation for agreement and disagreement between the survey and interview responses.

Eighteen participants took part in the survey of which 10 were male and 8 were female. Seven participants were interviewed of which five were male and two were female.

5.3.1 Stage 1 / Non – use

According to CAM, the first stage or the non-use level is when the individual becomes aware of the innovation or when the individual has not yet started using the innovation. The results in this stage show that the younger male participants were more enthusiastic about the online learning tool being introduced than other participants. This finding maps back to the Change Adoption Model where the first stage and non-use refer to when the individual is aware of the innovation or is yet to start using the technology. When the staff members at Organisation X became aware of the online learning tool, it was found from the study that the younger male participants who were most enthusiastic. According to Wood and Swait (2002), there is a personality trait that promotes change seeking in individuals.

Based on the above opinion by Wood and Swait (2002), the personality traits of each person defined their reaction to the introduction of the online learning tool. The results in this stage show that the younger male participants were more enthusiastic that the online learning tool was being introduced than other participants. The culture surrounding technology integration in an educational organization is an important factor in the acceptance or rejection of technology among teachers (Ertmer, 2005; Hu, Ma, & Clark, 2007; Matzen & Edmunds, 2007; Zhao et al., 2002). Norris, Sullivan, Poirot and Soloway (2003) also add that individual characteristics towards the use of technology maybe important in the larger interests of the organisation. Schumacher and Morahan-Martin (2001) found that men tend to have more favourable attitudes towards computers. These findings for this stage relates to the stage one of CAM, which is the stage where the individual becomes aware of the online learning tool.

The research also shows that male participants rated their computer skills higher than female participants did. Ong and Lai (2006) in their study surveyed 156 employees from six international companies in Taiwan and found that men's rating of computer self-efficacy, perceived usefulness, perceived ease of use, and behavioural intention to use e-learning are all higher than that of women. Thompson and Lynch (2003) reported that men faculty compared to women faculty were more likely to express confidence in their ability to organize and execute courses using online learning.

However, Campbell and Varnhagen (2002) opine that male and female faculty may approach technology in different ways. They claim that males learn the technology first and then consider its application to teaching whereas females focus on instructional needs first rather than technology. In other words, females put greater emphasis on pedagogy than technology, while males tend to be attracted by the technology first. It was mandatory for all staff members at Organisation X to use the online learning tool. Although male participants expressed more enthusiasm towards using the online learning tool, the female participants did not find it difficult to adapt to the online learning tool.

From the research findings, it can be noted that academic staff members have rated their computer skills lower than staff members from other departments. Hegarty and Penman(2005) in their report 'Approaches and implications of eLearning adoption in relation to academic staff efficacy and working practice' have found that academic staff members were at ease learning about computer technologies (83%), and were confident about their ability to teach well using them (77%). For 80%, the thought of using eLearning methods was uncomfortable and 69% felt anxious about using eLearning tools (Hegarty & Penman, 2005).

The disparity in our findings can be attributed to the fact that academic staff members do not spend as much time on the computer as the IT or admin staff members.

5.3.2 Stage 2 / Orientation

According to Straub (2009), the second stage is when an individual now has enough knowledge about the innovation's features and can now make a judgment on whether the innovation is favourable or unfavourable. The results of this stage show that the IT staff members have experienced more change than staff members from other departments. The research findings show that all staff members experienced some form of change when the online learning tool was introduced, but the IT staff members experienced the most change. The results in this stage when mapped to the model show that the staff members at Organisation X are at a point where they are aware of the changes in their role and can judge whether the innovation can be easily adopted to or not based on the change that they are experiencing.

The results of this stage show that the IT staff members have experienced more change than staff members from other departments. The reason for this might be attributed to the fact that the IT team and the IT trainers had the most communication and information about how to use the innovation. This can be reasoned based on communication channels, which is one of key components in Roger's IDT theory. Roger (1995) opines that the level of access an individual has to innovation affects the diffusion process. Communication is the means by which information about an innovation is passed from one individual to another. Communications through a peer or mass media can influence an individual to adopt a similar perspective on an innovation (Rogers, 1995). Since the IT team and the IT trainers had the most information on the online learning tool, they were well-versed with how the tool worked. They also had the responsibility of training other staff members to use the tool. Learning to use the tool and training other staff members to use the tool efficiently might be the reason why the IT staff members experienced more change than other staff.

The role of the technical staff team cannot be taken lightly. Esterly and Logan (2008) in their paper opine that people play the biggest role when a change occurs and without good technical support and personal touch implementing technology will be a struggle but not impossible. This indicates that the technical team plays a great role in making this transition to online learning. To help handle change, IT support is required at all levels. According to Esterly and Logan quick response time and continuous checks by the support team help staff from other departments to quickly adapt to the technology

"This also means that when a change is introduced there is more trust that the department won't leave them without support and in return reduces resistances to change."

<div align="right">(Esterly & Logan, 2008)</div>

The study conducted in Organisation X show that the IT staff members were constantly on standby to support all staff. The IT support staff and trainer provided other staff members technical support on how to use the online learning tool. The training and support given was the communication channel for the other staff members. The communication channels that the IT support staff provided to the other staff influenced their decision about using the online learning tool and the helped the diffusion process. Communication channel, one of Roger's key components played an important role in helping the diffusion process of the online learning tool. The communication through technical support by the IT team was a communication channel that helped influence the decision of the staff members to the online learning tool. The research findings show that all staff members found the technical support to be of high quality and of much help.

According to Kastelic and Ioncaric (2007), customers must be certain that if something goes wrong, they would always have a 'rescue exit' – someone, who is going to help them. In the case of Organisation X, it was the IT team.

On the contrary, Brown et.al. (2006) have opined that IT support services do not affect the way staff members use online learning for teaching. Their opinion indicates that IT support services in no way facilitate staff use of online learning. The research findings contradict this view as the participants felt that constant IT support made it easier for them to learn to use the online learning tool. Capobianco and Lehman (2004), Jones and Kelley (2003) and Surry et.al (2005) have all expressed that adoption of technology is impeded by lack of proper infrastructural support and non-availability of proper software and hardware.

5.3.3 Stage 3 / Preparation and Mechanical

This stage in CAM is a combination of LoU's preparation and mechanical stage with Roger's stage 3. By this stage, the individual has reached a point where a decision can be made to adopt or reject an innovation (Roger, 1995). The responses obtained in this stage determine whether the individual is keen to adapt to the online learning tool or not. Research findings show that administration staff members were the most prepared for the change due to online learning, the reason being that both the administration staff members were involved in the pilot project of the online learning tool before it was introduced officially to all staff members. This response relates to this stage of CAM because it shows the readiness or the preparation of the administration staff members to use the online learning tool.

Hence, administration staff members can be considered to be early adopters of the technology. According to Rogers (1995), early adopters are known as 'venturesome'. The early adopters utilise the innovation. They are people who love technology and find it fun and challenging. They use technology to achieve improvements in teaching and learning. Research undertaken by Jacobsen (2000) found that early adopters make the adoption of technology look easy. Other adjectives used to describe early adopters include 'lone rangers', 'isolated enthusiasts' (Taylor, 1998), and 'online mavericks' (Ellis and Phelps, 2000). On the contrary, the mainstream majority of staff members favour evolutionary change and are conservative. They seek proven applications of the use of technology in teaching.

Initially when the online learning tool was introduced, it was found to be slightly slow in terms of page load time. Hence, research findings show that the IT staff members have found lack of speed in page load times to be a technical issue. Some of the staff members found the lack of speed to be an issue while other staff members did not even mention this or find it to be an issue. This finding relates to the mechanical level of use in the Change Adoption Model. The mechanical level is where the user begins the implementation but struggles with logistics of the innovation. Hence, from the findings in this stage, the IT staff members generally struggled with the speed issue initially when the tool was introduced. This result is a direct relation to CAM's stage 3 or the mechanical level where the user started actively implementing the online learning tool in their day-to-day tasks, but still struggles with using the online learning tool effectively.

Clayton, Gower, Barr and Bright (2005) found that certain factors help some tutors while the very same factors that helped those tutors were a hindrance to some. This could explain the why some staff members in Organisation X did not find speed to be a technical issue.

At this stage in Organisation X, most of the users have reached a point where they have accepted the innovation.

5.3.4 Stage 4 / Routine

This stage relates to how the user acts on their decision. The results from this stage show that younger staff members have adapted to the online learning tool faster. The results also show that younger participants rate the features of the online learning tool higher than older participants do. These results show that this group of members have acted on their decision

to accept the online learning tool faster than other staff members. Although all staff members at Organisation X had at some point adapted to the online learning tool based on their decision, the younger staff members have adapted faster.

This study shows that younger staff members have adapted faster to online learning. Agboola (2008) in his case study has also found that there were generally linear relationships between the following:

- age and experience and e-learning adoption
- software skills and e-learning confidence
- e-learning training and e-learning adoption
- Internet skills and e-learning confidence and e-learning adoption.

Results from Agboola's (2008) research also indicate that there were statistically significant linear relationships between age, experience, software skills, and Internet skills.

5.3.4 Stage 5 / Renewal and Reflection

According to CAM, this is the confirmation stage. An individual reflects on his or her decision and implementation process and evaluates whether to adopt or reject the innovation adoption (Straub, 2009). The research findings show that staff members do not have a choice to reject the innovation as using the innovation is part of their day-to-day job at Organisation X. Hence, with relation to the CAM model, all staff members have adopted the innovation in their own style based on their personal characteristics and efficiency.

From the analysis, the following categories of participants found the impacts of the online learning tool to be more positive:
- Younger male staff from the IT department
- Staff with higher rating of computer skills.

The responses from this stage show that in the reflection process it could be identified that the younger male staff from the IT department found the online learning tool to be more positive. However all staff members were able to reflect back to how the online learning tool was introduced and implemented and provide suggestions. The responses to questions from this stage when mapped to CAM clearly shows that at the final stage of reflection, the user is able to think back on how the entire process of diffusion and what made them to adapt to the online learning tool.

According to Hayashe, et al (2004), computer self-efficacy does not define what one has done in the past, but concerns with what one can do in the future. Computer self-efficacy encompasses judgments of the capability to apply these skills to broader and more complex real time tasks. The effect of computer self-efficacy on the performance teaching-learning settings has been studied extensively. Vijayasarathy (2004) found that the computer self-efficacy affects the behavioural intention to use a system. An individuals' confidence of computer knowledge and abilities can influence the ease with which they can carry out a new task with a new technology Vijayasarathy (2004). According to Lee (2006), Compeau and Higgins (1995), Compeau and Huff (1999) and Hayashe, et al (2004) computer self-efficacy has been revealed to have a critical role in terms of its effect on perceive usefulness and perceived ease of use.

The research findings from this stage relate to literature mentioned in the paragraph above, staff members with higher computer skills and staff members from the IT department have higher computer self-efficacy and higher ability to adapt to the online learning tool. IT staff members who rated their computer skills higher found the impacts on the online learning tool to be more positive, which implies that they could easily adapt to the online learning tool and its introduction had a positive impact on them.

5.4   Implications

The implications of this research were both positive and negative. The research findings show that most of the staff members had a positive attitude towards using the online learning tool. The data gathered shows that all staff members were keen to adopt to the online learning tool although each person adopted to the tool based on their personal characteristics and skills. All staff members who used the online learning tool experienced some form of change in their day-to-day task. For some these changes had a positive impact and for others the change was not very positive. The change factor faced by staff members at organisation X was a major milestone and can be considered to be one of the negative implications. A few staff members suggested changes on how the online learning tool was introduced into the organisation, this indicates that there were some processes could be improved.

This report gives Organisation X an overall view of how the introduction of the online learning tool had an impact on the staff members in the organisation.

5.5   Limitations

5.5.1 Sample size

The study was limited to only 18 participants in the survey and 7 participants for the interview, hence the results obtained is limited to this group and cannot be applied to the larger field of online learning.

5.5.2 Organisation

The research was conducted only on one organisation as a case study thus limiting the research findings to one organisation.

5.5.3 Methodologically

No statistical analysis or tests were carried out on the data gathered from Organisation X. Descriptive analysis was applied to the data. Qualitative research using a case study was used for this study. Two different data gathering methods were used to collect data. Both surveys and interviews were conducted. The results of the data analysis were checked back with the literature available.

5.5.4 Organisation

The study has been limited to one organisation only. The results inferred from this study may not be applicable in other organisations, but can be used as a reference by educational organisations planning to implement online learning.

5.5.5 Researcher's point of view

This study was also limited to the researcher's point of view, as the researcher does not have too much knowledge in the field of online learning and had to read extensively about this field before taking up the study.

5.6   Research Questions addressed

Impacts, changes, and technical issues that occur when implementing an online learning tool in a tertiary educational organisation

Using the customised model Change Adoption Model (CAM), which is an integrated model from Rogers's IDT theory and CBAM's LoU model, the following research questions have been addressed in this report:

1.   What were the changes faced by staff members of the college to adapt to the online learning tool?

From the surveys and the interviews, the changes and the level of the change faced by each participant were obtained. Based on this response, the changes faced by staff members when the online learning tool was introduced were identified and consolidated. These changes were mapped to the model to understand what change staff members were experiencing at that stage of diffusion of the innovation. This mapping made it possible to analyse how staff members adapted to the online learning tool.

Each staff member experienced change in some way or the other. For some it was a impact of the change was low, but for others the impact was high. Based on the analysis, the changes that staff member faced can be categorised in the following groups:

1. **Personal career change:** Four out of the seven staff members interviewed found the introduction of the online learning tool and added bonus to their growth in the organisation and in terms of their career. This was a positive attitude was found to be very impressive.

2.   **Change in role and responsibilities:** Most of the staff members had more responsibilities added to their regular tasks. This added responsibility brought about a change in their day to day to work. This caused a high impact on some staff while was of low impact to others.

3. **Time:** Some staff had added responsibilities, as they had to work with the online learning tool as well as their regular day-to-day tasks hence the challenge they faced was time. According to Fitzgibbon and Jones' (2004), time is a challenge faced by many staff when adapting to an online learning tool. Although this was an

issue initially faced by staff members at Organisation X, they were able to adjust to their new responsibilities.

4. **Technology:** There were some technical issues such as slowness or freezing of the system. During this time, the technical staff members were under pressure to get these issues fixed. These technical issues affected the way staff worked at that time. They had to cope with the issues. Salmon (2000) places great importance on this phase claiming that the creation of online community in this phase is critical to effective online learning.

5. **Developing new skills:** No staff members had to learn IT skills to use the online learning tool, but they had to learn new teaching skills. The academic staff like Benfield (2000, p. 1) stressed that there was a need to develop a way to communicate online and use language thoughtfully.

2. How were these technical impacts and changes handled by the various departments?

From the data gathered, it was found that staff handled the changes in different ways. Some staff members created processes that helped them keep track of the academic information both in paperwork and for online learning, some used the help of the IT support team to learn how to use the features of the online learning tool and others read about how to effectively use online learning. The way the staff members handled the impact and changes maps to the first two levels/stage of the model where the characteristics of a person contribute to how an innovation was adopted. The results show that staff handled the impacts and changes based on their personality traits. Some adapted to the tool faster than others did.

3. What IT training before/after and ongoing IT support were provided to support transition to the online learning tool?

The research data shows that there was sufficient IT training before and after the online learning tool was introduced. Organisation X made it a point to provide the best possible IT training for all staff. The various types of training provided were:

1. **Pilot project:** A few staff members were selected to participate in a pilot project that took place before the online learning tool was introduced. The pilot project not only provided training in the skills of online learning, but also gave the staff members the insight into what it felt like to use the online learning tool and also critically reflect on

the experience and suggest changes Fitzgibbon and Jones' (2004). The pilot project prepared staff to handle the changes and impact that were brought about due to the introduction of the online learning tool.

2. **Professional development for staff members:** Professional development sessions were conducted regularly for staff members at Organisation X before and after the online learning tool were introduced. Roberts et al (2002, p. 6) claim that "the sooner professional development in teaching and learning with ICT is incorporated into all aspects of quality assurance in higher education, the sooner good practice will emerge and the less uncertain and confusing the future may be." According to Robinson (1998, p.34) strategic staff development needs to be aligned to organisational and individual goals, systematic process with planning and control and aimed at improving knowledge, skills, attitudes and performance at the level of the individual, the work group, and the organisation.

3. **Constant IT support:** These forms of IT training and support in some ways influenced the user's decision on how quickly they adopted to the online learning tool based on a key component communication channel, which is an important part of the diffusion process as per Roger's IDT model.

5.7   Conclusion

To summarise this chapter, the changes, impacts and the technical issues that arise when an online learning tool is introduced were identified from the data analysis. These changes are common to changes that occur when an online learning tool is introduced. The staff handled the changes in a professional manner and with the support of the organisation and the IT team that helped them to adapt to the online learning tool quickly.

PERSONAL REFLECTION

The journey, which led to the completion of this study, has been challenging and enjoyable for the author. The author is very privileged to have been granted permission to carry out the research at Organisation X.

Initially, the approval for this study by Unitec's Ethics committee took a long time. On receipt of the approval, the author started the study with the data gathering process. This was a challenging phase, as the author had to be patient to accommodate the participant's free time to carry out the interviews. Once data was collected, the process of analysis of the data was started. After about 3 weeks of analysis, the current supervisor left and a new supervisor was appointed. Under the guidance of the new supervisor, the process of data analysis was made very interesting. Straub's paper on Understanding technology adoption: theory and future directions for informal learning made it much easier for the author to understand the theoretical models available and how they are used. A customised theoretical model, which is the Change Adoption Model (CAM), was developed and this was possible only due to the in depth understanding of the theory, which was enabled with the help of the supervisor.

The writing of each chapter was interesting. The chapter that the author found most difficult to write was the discussion chapter which involved concentration and in depth analysis of the research findings and relate it to the theoretical model and literature.

The journey to obtain the masters degree has been a good learning curve. Not only was the journey a challenge and a test for endurance and patience, it was enjoyable. Looking back at all the effort and late nights put in, the author is satisfied and pleased of the outcome. Perseverance and hope is the key to completing the race and reaching the goal intended. The Masters programme has equipped the author with the skills required to overcome challenges and apply the learning in a work environment.

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1. Survey Questions

The following are a set of draft questions that were asked in the survey sent to all the staff members of the organisation.

1. Age: less than 31   31-40   41-50   51-60   More than 61

2. Gender: Male   Female

3. How often do you use the computer and the internet? Please select one:
   - Less than 2 hours a day
   - – 4 hours a day
   - – 6 hours a day
   - 6 – 8 hours a day
   - More than 8 hours a day

4. How would you rate your computer skills on a scale from 1-10 with 10 being the highest? _____

5. What department do you work for in the organisation? Please select one:
   - Administration
   - Academic
   - IT
   - Enrolments
   - Others: Please specify _____

6. What was the impact of changes to your responsibilities in your role due to the introduction of the online learning tool?
   - No change
   - Minimal change
   - Much change
   - Total change

7. Have you used the online learning tool ecelearn?
   Yes   No

8. What IT related problems have you faced while using the online learning tool?

- Speed problems
- Problems working with other software in the online learning tool
- Adapting to new IT skills
- Others: Please specify _____

9. Do you use ecelearn from home?

   Yes   No

   9a.   If Yes, do you use broadband or dialup? _____

   9b.   Are the IT related problems you face while using ecelearn at home
   - Less than at work
   - Same as at work
   - More than at work

10. What are the impacts of introducing an online learning tool? Please select one:
    - Totally negative impacts
    - Mainly negative impacts
    - Both equally positive and negative impacts
    - Mainly positive impacts
    - Totally positive impacts

11. Please rate each of the following learning tools using a five point scale

    0 = never used, 1 = not useful, 2 = slightly useful, 3 = moderately useful, 4 = quite useful, 5 = very useful
    - Discussion forums
    - E-messages
    - Notice board for important alerts
    - Online classroom for study guides
    - Online marking
    - Online assessment submission
    - Online assessment allocation/reallocation for marking
    - Online return of assessments
    - Grade book

2.   Interview questions

The following are set of interview questions that were asked in interviews with selected staff members of Organisation X. The interview was taped so as to have accurate data for analysis.

There are four groups of staff that were interviewed. Each group had its own set of questions:

1.0   Questions for the IT trainers

1. What was your initial reaction to the introduction of the online learning tool in the organisation?

2. What kind of training was provided before the online learning tool was introduced?

3. What were the changes to the responsibilities in your role due to the introduction of the online learning tool?

4. How have the changes due to the online learning tool impacted you?

5. How did you train the staff?

6. How was the training organised?

7. What kind of technical issues were raised by the staff while training?

8. Were you able to answer the questions or did you have to refer it to another person?

9. What problems did you face during the training?

10. What problems did you face after the training?

11. What was the difference you noticed while training a person experienced in using online learning tools and a person new to online learning tool?

12. How do you learn about new updates to the online learning tool?

13. What in your opinion are the positive impacts of introducing online learning?

14. What in your opinion are the negative impacts of introducing online learning?

15. Have you benefited in any way from the introduction of the online learning tool?

16. If given the chance, what would you have changed to implement the online learning tool in a better way?

2.0 Questions for IT Support Personnel:

1. What was your initial reaction to the introduction of the online learning tool in the organisation?

2. How were you trained to provide support for the online learning tool before it was introduced?

3. What were the changes to the responsibilities in your role due to the introduction of the online learning tool?

4. How have the changes due to the online learning tool impacted you?

5. What types of support do you provide to the staff?

6. What are some of the common IT problems that staff encounter while using the tool at work?

7. What are some of the common IT problems that staff encounter while using the tool outside work?

8. What kind of technical issues are raised by the staff while using the tool?

9. Are you able to answer all the questions or did you have to refer it to another person?

10. How do you learn about new updates to the online learning tool?

11. What in your opinion are the positive impacts of introducing online learning?

12. What in your opinion are the negative impacts of introducing online learning?

13. Have you benefited in any way from the introduction of the online learning tool?

14. If given the chance, what would you change in the way training for the online learning tool was provided to staff?

3.0   Questions for Admin Staff:

1. What was your initial reaction to the introduction of the online learning tool in the organisation?

2. What kind of training was provided before the online learning tool was introduced?

3. What responsibilities do you carry out in your role in the organisation?

4. What were the changes to the responsibilities in your role due to the introduction of the online learning tool?

5. How have the changes due to the online learning tool impacted you?

6. What extra/different skills are needed to work with the online learning tool?

7. Was constant IT support provided?

8. What kind of training was provided after the online learning tool was introduced?

9. What are common technical problems that you face encounter while using the online learning tool?

10. Do these technical issues hinder the way your work?

11. How have you adapted yourself to using the online learning tool?

12. What in your opinion are the positive impacts of introducing online learning?

13. What in your opinion are the negative impacts of introducing online learning?

14. Have you benefited in any way from the introduction of the online learning tool?

15. If given the chance, what would you have changed to implement the online learning tool in a better way?

4.0　Questions for Academic Staff:

1. What was your initial reaction to the introduction of the online learning tool in the organisation?

2. What kind of training was provided before the online learning tool was introduced?

3. Have you used an online learning tool before?

> 3a. If yes, has the experience of using an online learning tool helped you adapt to this tool quicker?

4. What responsibilities do your carry out in your role in the organisation?

5. What were the changes to the responsibilities in your role due to the introduction of the online learning tool?

6. How have the changes due to the online learning tool impacted you?

7. What extra/different skills are needed to work with the online learning tool?

8. What kind of training was provided after the online learning tool was introduced?

9. Was constant IT support training provided?

10. What are common technical problems that you face encounter while using the online learning tool?

11. Do these technical issues hinder the way your work?

12. Which mode of teaching do you prefer online learning mode or a classroom based mode of teaching and why?

13. What are the differences between classroom based teaching and online teaching?

14. What features of online learning do you like the most and why?

15. What features of online learning do you not like and why?

16. How have you adapted yourself to using the online learning tool?

17. What in your opinion are the positive impacts of introducing online learning?

18. What in your opinion are the negative impacts of introducing online learning?

19. Have you benefited in any way from the introduction of the online learning tool?

20. If given the chance, what would you have changed to implement the online learning tool in a better way?