Abstract

E-learning involves the use of information and communication technologies (ICTs). It is transforming universities and has undergone immense change. Therefore, it has become the main tool for improving educational and training activities. Many universities are combining e-learning components with their conventional instruction in order to enhance the delivery of traditional courses.

However, many models of e-learning initiatives fail to achieve desired learning and teaching outcomes, because of the selection of inappropriate technology, instructor characteristics, or failure to provide sufficient attention and support from the organization (Engelbrecht 2005; Selim 2007). Despite the potential models of e-learning as tools to enhance education and training, their values will not be realized if instructors, learners, and organizations do not accept them as efficient and effective learning tools. Yet, it seems that universities in the Middle East are still at a fundamental stage of adopting and implementing e-learning despite the plentiful factors that suggest e-learning as a support tool capable of enhancing the process of learning.

The reason behind selecting Middle Eastern universities is that in Arab countries mostly focuses on the insertion of new technological features without taking into account psycho-pedagogical concerns that are likely to improve a student's cognitive process in this new educational category. Also, fragile strategies for e-learning have existed in most of the Middle Eastern universities. Consequently, describing strategy is serious to the successful deployment of e-learning initiatives in Middle East and Arab countries.

The aim of this thesis is to explore the criteria affecting the introduction of a maturity model in the deployment of e-learning in Middle Eastern countries. Building on the extant literature review concerning the identification of critical success factors (CSFs) of e-learning, many factors (instructor characteristics, information technology infrastructure, and organizational and technical support) were examined and it was found that there is no complete model for e-learning. Also, this review concluded that the factors developed need modification to account for Middle Eastern status. These modifications resulted in the development of an e-learning maturity model affecting e-learning development in the Middle East.

The thesis was mainly a sequential exploratory study that employed in-depth interviews, supplemented by questionnaires. Qualitative data was collected from interviews and analyzed using Grounded Theory. The results of the qualitative analysis were followed up by collecting quantitative data using online questionnaires. The quantitative data was analyzed using exploratory and confirmatory factor analysis. A total of 600 responses were used in the quantitative analysis, while a total of 150 interviews responses were used in the qualitative analysis.

The results of this study provide an insight into six important dimensions. First, the results describe how learners' perceive e-learning models in higher education institutions and sheds some light on learner attributes that may be prerequisites for benefiting from and accepting e-

learning models. Second, they address the issue of higher education institutions' strategies for e-learning initiatives. Third, the results describe how learners' perceive e-learning features in higher education institutions. Fourth and fifth, they explain the criticality and importance of the instructor, and student attitudes towards e-learning environments. Sixth, they assess the effect of e-learning on students.

Acknowledgment

I can clearly remember when I received an email from Middlesex University informing me that I was accepted as a research student. Since that day, everything in my life has changed. I would like to acknowledge my thanks and extend my sincere appreciation to Dr. George Daflous for his patience and support during my study at Middlesex University.

Also, three people to whom I am grateful:

My father, the man who has always encouraged me to be nothing but the best: the man without whose support, guidance and encouragement, I wouldn't be here now. To him, and from all my heart, Thank You. You have changed my life and future. Baba, I owe all this to you.

My mother, the person who I always felt that, whoever I am, or whatever I do, she will always love, care and be proud of me. To you Mama, I will always, always remember what you have done and continue to do for me.

My wife, my only true love, my scented candle, my sweet future and my home.

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Chapter One Introduction

1.1. Introduction

Information technology has restructured everything in our lives; especially our attitudes towards learning. Thus, e-learning has become a strategic element which can be adopted by higher education institutions to improve educational outcomes and to enhance students' skills. E-learning can be defined in different ways - for example, instructions delivered via all electronic media (Engelbrecht 2003); learning facilitated by the internet (Meredith & Newton 2003); and distance education using information technologies (Watanabe 2005). However, the most important consideration is the e-learner, who is ignored in all previous definitions. Since the1990s, e-learning has become a phenomenon (Rajasingham 1988). Moreover, the extraordinary growth in e-learning deployment has resulted in a number of national guidelines for its evaluation.

In addition to the benchmarks of e-learning and cross-cultural research, there is no clear framework or model, that can be used for the introduction of a uniform model in the deployment of e-learning yet. Although, there have been attempts to definite steps, notably in New Zealand, to utilize alternative models such as the electronic Maturity Model (eMM) (Marshall & Mitchell 2004). However, there are no signs of results as yet in the Middle East.

Further reading of the literature has identified an array of dimensions that would seem to be needed for the development of an e-learning maturity model. These dimensions can be summarized as follows: a) Students' attitudes towards e-learning (exploring students' attitudes towards e-learning and enlightening the most important factors which affect students' attitudes); b) Effects of e-learning on students (enhancing the learning content through the use of simulations, multimedia and interactive content); c) The way in which e-learning is being implemented? (Constructivism - Behaviourism - Cognitivism); d) Universities' attitudes towards e-learning (what capabilities are required by universities adopting e-learning, for example in technology, software, infrastructure and staff development courses?); and e) Strategies for implementing e-learning (what are the philosophies and strategic plans which can help in e-learning implementation?).

Consequently, this research attempts to reinvestigate the most important factors which formulate a maturity model for e-learning at Middle Eastern universities. This model would be able to create a uniform vision for e-learning deployment in Middle East universities.

1.2. Statement of Problem

E-learning refers to the use of electronic methods to convey and receive knowledge and skills. This phenomenon (e-learning) has been raised in the developed nations of the world and in Middle Eastern universities. Miniwatts Marketing Group (2010) estimates the total number of

Internet users on 30th June, 2010 to have been 1,966,514,816. Figure 1.1 provides a geographic breakdown, showing that 3.2% were in the Middle East, 24.2% in Europe and 5.6% in Africa.

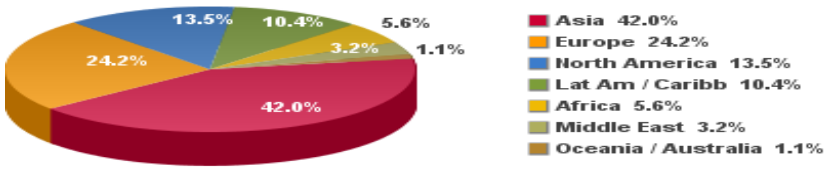


Figure 1.1 Internet users in the world distribution by world regions -2010

(Copyright © 2010, Miniwatts Marketing Group)

> "Despite the varying degrees of digital readiness in different parts of the Arab world, a quick survey of the educational scene in the region shows substantial interest in online learning and several attempts at starting programmes in this new paradigm. The e-learning market in the United Arab Emirates (UAE) alone is currently estimated at $14 million and is expected to increase to $56 million by 2008. In the Arab Gulf (Saudi Arabia, UAE, Kuwait, Bahrain, Qatar, and Oman, in decreasing order of edu-economic importance) total spending on e-learning was estimated at $72 million in 2004. This figure is well below the average in much of the world, but it's growing at a 27 percent compound average rate. Online education spending in the Arab Gulf region will thus reach $240 million by the end of 2009, with Saudi Arabia and the UAE representing about 80 percent of the total. With its large student population, Saudi Arabia dominates in academic e-learning, while the UAE leads in business e-learning services" (Guessoum 2006).

Obviously, E-learning does not depend only on internet penetration and government budgets but also strongly on student attitudes towards e-learning, effects of e-learning on students, university attitude towards e-learning, instructional design models for e-learning and e-learning strategies, all of which vary hugely from one Arab country to another. The situation is most advantageous in the Gulf cities and least favourable in Arab poor countries, such as Sudan and Yemen. It often seems that the e-learning debate in higher education is affected by numerous factors. These factors, however, fail to capture why e-learning does not achieve potential results. Therefore, it is essential to look at what actually happens on the ground through exploratory study.

Whilst there have been various researches which address the factors affecting e-learning, most of them are not based on direct empirical evidence (see Al-Doub et al. 2008; Bertea 2009). There are, of course, some empirical researches of the uptake of e-learning at university but, these tend to focus on the assessment process for certain individual factors and, students' attitudes towards e-learning, or to address the effects of e-learning on students (Singh et al. 2005). These researches can be classified as the following: both learners' and instructors' attitudes towards e-learning, instructional design models for e-learning and e-learning strategies.

Abdel-Wahab (2008) tries to measure students' attitudes towards e-learning and defined elements that can be used in modelling students' attitudes towards e-learning. Also, Mandernach et al. (2006) explored students' attitudes but from the perspective of online instructors, whilst Havelka (2003) proved differences in beliefs toward e-learning do exist between different majors and Thomassian et al. (2008) examined how e-learning would be embedded in introductory courses. This idea was supported by a study conducted by Partridge and Edwards (2004), explored how e-learning has been implemented in educational institutions. Cotterill et al. (2005) pointed to the importance of students' basic information technology skills level before starting an e-learning program.

The literature on e-learning is dominated by various factors, but there is no maturity model for e-learning. While the maturity model provides a valuable experience, it has the ability to measure these factors to create a successful model for e-learning. For these reasons, this thesis seeks to understand the process of creating a successful uniform model for deploying e-learning and studying relationships between factors.

Thus, the intention of this research is to explore factors for the development of the e-learning maturity model and how they could be used to measure it?

The next section presents the background and context to traditional e-learning, and as such it lays the foundation for this study.

1.3. Background

The Organization for Economic Cooperation and Development (OECD 2005), in partnership with the UK-based Observatory on Borderless Higher Education (OBHE), carried out a survey of online learning on commonwealth universities, undertaken in 2004. The results revealed that:

1. Students take up of e-learning is growing, in general.
2. Fully online whole programmes account for fewer than 5% of total enrolments.
3. The number of students enrolled in at least one course with a high online presence would be much higher, and sometimes from 30% to 50% of total enrolments.
4. In most institutions, cross-border enrolments for e-learning are a small scale, peripheral activity.
5. Whole award programmes with relevant online presence were more common at postgraduate level.

6. IT and business/management emerged as the most commonly cited disciplines making significant use of some form of e-learning, particularly in the mixed mode and fully online categories.

These results demonstrate that e-learning has not reached its full potential. Hence, universities might face obstacles in predicting the number of issues, such as the degree of satisfaction of e-learning among their possible users, new pedagogy which has resulted from e-learning, readiness for e-learning, strategies of implementing e-learning, how e-learning will be embedded in the curriculum, and discovering differences in beliefs toward e-learning which exist between different majors.

In the Middle East, Beckstrom et al. (2004) carried out research in Egypt about willingness for e-learning deployment. Their report presented an optimistic response. Fayek (2004) identified some e-learning projects including the Faculty of Engineering at the University of Cairo converting of text books to interactive CD-ROMs and the American University in Cairo using WebCT as learning management system (LMS). Kamel and Wahba (2003) presented the relationship between Middlesex University and a regional information technology institute to offer a Master of Science degree in business information technology in Egypt.

Obviously, e-learning has been used to enhance student learning. Previous researches have been geared towards the study of students' attitudes towards e-learning with different methodologies. In addition, literature in the e-learning domain is dominated by research that examines one factor, but there is minimal research that has examined a maturity model for e-learning.

Bertea (2009), for example, suggests that the effectiveness of e-learning is influenced by factors such as students' attitudes toward the adoption of e-learning, and the technological experience they have. In the same context, Saadé et al. (2007) identified seven factors characterizing students' success in a web-based learning environment. Also, Al-Doub et al. (2008) revealed that culture appears to be a key element in students' attitudes to, and use of, e-learning materials. There were some differences between genders in using e-learning resources. Other investigations proved that, in order to maximize students' chances for successful completion of an online course, it is beneficial to integrate literature on internal learner attributes with an understanding of key external factors that impact the online educational experience (Mandernach, Donnelli & Hebert 2006).

Also, Bertea (2009) has indicated that "a connection between technical abilities and students' attitude towards e-learning, and attitude is also influenced by time dedicated to computer use and is indicator of PC experience". Moreover, Havelka (2003) has focused on differences in beliefs toward information technology do exist between different majors. On the other hand, Keller and Cernerud (2002) concluded that the policy of implementing e-learning may play an essential role for students' attitudes towards e-learning. In subsequent research in a follow-up study, Partridge

and Edwards (2004) set out to test how e-learning is being implemented, with the results revealing an engagement to open dialogue with students used to identify their attitudes and expectations.

A large majority of these studies rely on one factor (i.e. students' attitudes, academic attitudes, differences in beliefs toward e-learning, models for e-learning, university attitude or strategy of implementing e-learning), but there are only a few studies providing correlational data between more than one factor suggesting that it is important to balance these factors. In this thesis, the E-Learning Maturity Model (ELMM) provides a means by which Middle Eastern Universities can assess and compare their capability to sustainably develop, deploy and support e-learning. Therefore, the maturity model of e-learning undertaken in this thesis is a step in that direction.

Put simply, e-learning is a vast and growing concept with great potential in higher education. In order to maximize this potential, e-learning implementations should attempt to satisfy the requirements and concerns of higher education institutes. In the same context, we should have guidelines to measure our progress and maturity level in this field. For example the maturity model could point to the case of an organization without a clear e-learning strategy being neither ready nor mature. However, staff members who are familiar with e-learning models can be at a high maturity level.

Therefore, the purpose of the current research is to examine all these factors through one model, known as the maturity model for e-learning (ELMM). Thus, this thesis will add to the debate on the value of e-learning by focusing on a maturity model of e-learning. As such the study aims to make a support to the area of e-learning through the following points:

1. A maturity model of e-learning is a framework proposed to deploy e-learning in Middle Eastern countries.
2. It identifies those dimensions which could impact on e-learning deployment.
3. It provides a better understanding of how e-learners understand e-learning.
4. It provides a greater awareness of how students' perceptions within an e-learning environment might impact their learning.

Based on the previous aims, an exploratory sequential study was employed to achieve these aims. The next part describes the approach and purpose used in this study.

1.4. Research Purpose

The provision of e-learning education for aspiring university students is a major responsibility of Middle East universities, and their failure or success at this task is largely dependent on their capacity to implement a maturity model for e-learning.

In the same context, the factors affecting students' attitudes towards e-learning have been researched. Al-doub et al. (2008) have recognized that culture is very important factor affecting a

student's ability to accept e-learning. Also, characteristics of successful e-learners have been identified; for example, Time, Technology, Initiative, and Competence (Mandernach et al. 2006). O'Donoghue & Singh (2001) have agreed that e-learning can provide a model for students of how to become self-directed independent learners, which may assist them to become 'lifelong learners'. Moreover, not all students express the same attitudes towards e-learning as there are some indications that differences in beliefs toward e-learning do exist between different majors (Havelka 2003). Also, Partridge & Edwards (2004) examine how implementing e-learning and how collecting data from students regarding e-learning are very important steps. Moreover, technical support and computer labs should be made available to prove universities' readiness for e-learning (Abdel-Wahab 2008). Furthermore, Keller & Cernerud (2002) have identified that the strategy of implementing e-learning may play a crucial role in students' perception of the new technology.

In spite of these changes and the hope to create an improvement of learning and teaching processes, the technology innovation did not help users to learn more than in traditional training contexts (Najjar 1996, Hansen 1998, Tselios et al. 2001, Costabile et al. 2005). E-learning is producing fast and deep modifications both in learning and teaching, but nevertheless the educational software and environments actually in use in this domain did not help students to learn more effectively than in traditional training contexts. This circumstance leads to a failure of many e-learning courses to reach their full prospective. What is the reason? It could be found both in users' information processing strategies at Middle East universities, and in a lack of evaluation studies concerning cognitive models of the human learning process underlying the design of software actually in use.

Depending on previous debates, this thesis is therefore based on the argument that we have deficient knowledge about models that can be applied to assessments appropriate to e-learning deployment. It reveals gaps both in the existing literature and working practices, regarding the e-learning needs of the maturity model and in current approaches to provide a holistic e-learning solution that can integrate different dimensions to formulate this model.

Consequently, the important point in this thesis is the need to develop a mechanism to assist learning providers to combine different dimensions and produce a maturity model of e-learning. This model could be one of the first tools or guidelines to provide quantifiable dimensions, and also assist in the e-learning readiness assessment as a further work.

The new idea in this research lies in exploratory sequential design. The purpose of this is to qualitatively explore with a small sample and then to determine if the qualitative findings generalize to a larger sample. The first phase of study will be the qualitative explorations of strategic dimensions, in which in-depth interview responses will be collected from participants at phase one. From the initial exploration, the qualitative findings will be used to develop measures

that can be administered to a larger sample. In the tentatively planned phase, questionnaires will be collected from participants.

The next section presents and discusses the research questions.

1.5. Research Questions

This research goes on to study the components of the maturity model for e-learning to provide a quantifiable tool. Therefore, the data will be collected and analyzed according to the following research questions:

Research Question 1: What are the criteria affecting the introduction of the maturity model in the deployment of e-learning in Middle Eastern countries?

Research Question 2: To what extent could these criteria measure maturity level in e-learning?

The next section describes the methodology used in this study.

1.6. Research Method

In order to answer the above two questions both qualitative and quantitative research methods were adopted in the following way:

How do the themes mentioned by students and staff help to explain any quantitative differences by using a maturity model as the assessment mechanism of e-learning provision in developing countries?

A qualitative approach will help in exploring the concepts of the e-learning maturity model, and consequently these concepts could be tested quantitatively. The purpose of a two-phase, sequential multi-methodological study is to explore and generate dimensions about a maturity model of e-learning which can be used to assess the maturity level of certain dimensions of e-learning in Middle Eastern universities, using face- to- face interviews. Then, based on these dimensions, the second phase is to develop an instrument and to survey students and staff about the e-learning maturity model and its dimensions. In this context, the research will first interview a few participants to obtain their specific language and comments about e-learning, and then follow up with a large number of surveys. In these situations, collecting both open-ended qualitative and closed- ended quantitative data proves advantageous.

The resulting mixture or combination has complementary strengths and no overlapping weaknesses. When different approaches are used to focus on the same phenomenon and they provide the same result, the research has superior evidence for the result. Other important reasons for doing multi-methodological research are to complement one set of results with another, to expand a set of results, or to discover something that would have been missed if only a quantitative or a qualitative approach had been used.

1.7. Limitation

Initially, the scope of the research introduces limitations. The research examines exploitation of e-learning in HEIs in Middle Eastern universities. A limitation of the study is that financial constraints prevent me from conducting detailed analysis of data in more universities in all Middle East countries. In other words, the sample was limited to students at Middle Eastern universities (using sultanate Oman, Egypt and Bahrain as samples) as financial limitations prohibited the study of a larger sample. Many of the statistically insignificant results might be affected by the small sample size.

1.8. Summary

E-learning has been widely adopted by higher education institutions in the developing countries. Also, it offers several advantages for higher education administrators, faculty, and students. In the same context, a uniform model for e-learning represents the key determinant of the diffusion and success of such a type of education in higher education institutions. For example, in their Interim Report on e-Learning, The Commission of the European Communities (2002) emphasized, in three of the ten identified key e-learning challenges, that "decision makers need relevant benchmarks and indicators", "the market for e-learning content needs to be developed" and "emphasis must now be placed on quality, standards and pedagogy" (p.11), reflecting the importance of having an assessment tool for e-learning.

At the present time, most of the Middle East public universities have the basic resources required for the implementation of e-learning yet limited research studies have been conducted to investigate criteria affecting the introduction of a maturity model in the deployment of e-learning in Middle Eastern countries. Therefore, this study aims to examine a maturity model for e-learning as well as to explore the relationship between students' attitudes and their perceptions of e-learning, university readiness, effects of e-learning, strategies of e-learning, and how e-learning could be implemented.

Finally, the main contribution of this thesis, in this area of research and development, looks to:

1. Provide a maturity model for e-learning which can be used to assess the maturity level of e-learning.
2. Start to bridge the identified gap between the Middle East and developed nations.
3. Identifying the dimensions that might impact on e-learning readiness assessment.
4. Implement a successful model for e-learning that will provide a better understanding of how e-learners engage with the e-learning environment and the new digital learning materials.
5. Contribution to methodology where the exploratory sequential design method has been applied in e-learning field for first time.

Having provided these foundations, the thesis can now proceed with a detailed description of the research, starting in Chapter 2 with the background and context to e-learning.

Chapter Two Literature Review

2.1. Introduction

Carroll and Swattman (2000) explain the significance of a literature review in the development of research. This is located within the context of building a theoretical framework on which to balance the interests of usefulness and effectiveness. They argue that the review should be comprehensive in order to achieve a broader perception of the subject under study. Also, Marshall and Rossman (2011) and Creswell (1994) stress the importance of a literature review in the setting up of research as it provides a structure for establishing the importance of the study, as well as a benchmark for comparing the outcomes with other conclusions, filling in gaps and extending preceding studies.

Therefore, for this research the literature review acts as a starting process which will lead us to explore and gain a better understanding of the main objective of the thesis, i.e. establishing the criteria affecting the introduction of a maturity model in the deployment of e-learning in Middle East countries. The objective of this literature review is to provide a preliminary mapping of the literature and research in terms of the e-learning maturity model in Middle Eastern universities in order to review how to evaluate e-learning in different environments. Also, it aims to explore the meaning of "the maturity model for e-learning" in universities, both practically and theoretically; to identify what are the causes and effects; and to determine how e-learning strategies can influence the maturity model. Frameworks provided in this literature review will illustrate how the maturity model factors impact upon the evaluation process for e-learning. Thus, this chapter reviews recent researches from the field, identifying the main issues relating to the dimensions of the maturity model for e-learning in HEIs.

The next section discusses the strategies for moving into e-learning.

2.2. Shifting Towards E-learning

One of the most important strategies for moving into e-learning is keeping up a competitive position and/or opportunity to take advantage of current teaching technologies (Gerrard & Gerrard 2002). However, as Hewitt-Taylor (2003) reports, technology itself cannot enhance courses which are poorly developed. Students' skills and cultural issues make effective delivery of the e-learning process a complex and uncertain project (Carswell et al. 2000).

Wagner et al. (2008) investigated who is responsible for e-learning success in higher education and they determined e-learning Stakeholders' Responsibility Matrix. This was a rather one-dimensional view, although it was appropriate at the time. Since then, the growth in the Internet and the use of computers in every aspect of our daily lives has meant that is necessity to have a framework to evaluate e-learning environments. However, despite extensive research into

the use and effects of e-learning, many issues relating to the measurement of success in e-learning are still unresolved. For example, the American Society reported that:

> "*Although recent attention has increased e-learning evaluation, the current research base for evaluating e-learning is inadequate…Due to the initial cost of implementing e-learning programmes, it is important to conduct evaluation studies." (American Society for Training and Development 2001).*

Thus, Chapter Two introduced and defined dimensions for e-learning, describing it as a maturity model. This is important because e-learning was traditionally researched from a comparison perspective. By treating e-learning as a maturity model, it was possible to bring maturity approaches in software engineering to bear on its exploitation. It also enabled this research to create a uniform evaluating strategy for e-learning. The chapter continues with a choice of the criteria affecting the introduction of a uniform model from a practical and theoretical perspective.

Consequently, this chapter has reviewed recent research from the field, drawing out the main issues relating to the use of the maturity model for e-learning in higher education, with particular emphasis on the criteria affecting the introduction of the maturity model in the deployment of e-learning in Middle Eastern countries.

A review of the literature related to this study covered two sections of investigation:

1. The maturity model for e-learning as a paradigm shift; and
2. Students' attitudes, effects of e-learning on students, instructional design models for e-learning, university attitude towards e-learning, and strategies of implementing e-learning- all factors which will be illustrated as dimensions for the e-learning maturity model.

2.3. The Maturity Model for E-learning as a Paradigm Shift

The maturity idea was established in an attempt to create tools for the assessment of e-learning which were informed by the success of process maturity approaches in software engineering (Paulk et al. 1993a). This work has resulted in a model explained as an "e-Learning Maturity Model", or eMM (Marshall & Mitchell 2002; 2003; 2004) which merges the Software Process Improvement and Capability Determination (SPICE) framework with a set of practices derived from educational institutions. Also, Developing Criteria for an On-Line Learning Environment: From the Student and Faculty Perspectives is the subject of a study carried out by Cohen and Ellis (2004), who point to initial identification of quality indicators for the on-line environment, and their categorization.

Despite highlighting e-learning, it was obvious that models for successful deployment have not yet been recognized (Phipps & Merisotis 1999; Zemsky & Massy 2004). Even with the huge

quantities of money being spent, it is not clear that any enhancement in student learning outcomes has been recognized (Conole et al. 2000; Hewitt-Taylor 2001; GAO 2003).

In other words, the situation has been further convoluted by the belief that e-learning was certain to result in structural changes to the education sector (Katz 1999; Cunningham et al. 2000; Zemsky and Massy 2004). Part of the enlightenment of the lack of clear success in e-learning is expected to be the complication of the problem of deploying the new approaches (Kenny 2001; Radloff 2001) this is because the projects usually involve several disciplines and special types of expertise, combined in an environment with significant tension between technology, pedagogy and organizational concerns (Reid 1999; Laurillard 2002).

As an aside, the eMM obtains its essential theoretical foundation from the insights learnt in the field of software engineering. Software engineers recognized that *ad hoc* processes were abating the ability of software organizations to deliver successful and high quality software (Paulk et al. 1993a).This resulted in the development of the Capability Maturity Model, or CMM (Paulk et al. 1993a; 1993b) which supplies both a road map for enhancement of process capability and a means of benchmarking organizations for both comparative and planning purposes. A significant attribute of the CMM is that it does not rely on the technical elements of the process inputs and outputs, but rather concentrates on the ability of the organization and individuals to be effective (Humphrey 1994). This freedom has seen the CMM extended to support human resource activities (Curtis et al. 2002).

It is worth mentioning that Griffith et al. (1997) applied the CMM to the Southwest Texas State University with the purpose of improving the delivery of education. In the end, the results refer to the application of the CMM in its conventional role of leading information system improvement rather than e-learning delivery. In the same context, Marshall and Mitchell (2002) have created a five-step model, called the Capability Maturity Model (CMM), for using an adapted version of e-learning: initial (institutions at stage 1 are described by an *ad hoc* approach to e-learning), planned (institutions at stage 2 have implemented a more planned approach to e-learning, with feedback collected from end-of course evaluations used to improve the tools and techniques used), defined (institutions at stage 3 have begun to integrate e-learning topics into university teaching and learning or strategic plans, often developing an e-learning vision), managed (institutions at stage 4 have developed positive criteria for evaluating e-learning in terms of enhanced student outcomes rather than just perceptions), and optimized (institutions at stage 5 have conducted a plan for revising the educational efficiency of e-learning initiatives).

Manford and McSporran (2003) present a simple CMM derived E-Learning Capability Model, increasing attention on the evolution of capability over multiple years. They have presented a capability maturity model for e-learning and used it to show a visual representation of the e-learning capability of four large tertiary education institutions, two in Australia and two in New Zealand. This is only a preliminary investigation with a sample is small. Also they said

that "more data has been collected and still needs to be examined, nevertheless we hope we have been able to display that the model is able to deliver a valuable visual guide and a method of comparing the e-learning maturity of the four organizations".

Moreover, Vollmer (2003) talks about the commercial Learning Management System (LMS) market, suggesting a CMM approach with five stages: organic, initiative-driven, enterprise-based, competency-based, and knowledge-management-based. No practical basis for the model or evidence of its application is supplied.

Also, Harris (2004) goes on to present a model for e-learning improvement with six levels: nonexistent, initial, repeatable, defined, managed and optimized. This is supported by a study carried out by Neuhauser (2004) who presents a model derived from the CMM, called the Online Course Design Maturity Model (OCDMM), which identifies five levels: initial, exploring, awakening, synergizing strategies and integrating best practices. It has been found to be valuable as a tool for managing faculty in moving towards best practices in course design.

All preceding researches dealt with the e-learning maturity model as a process which needs to be developed not as the process which needs to be explored and evaluated.

In the next section, a review of the literature related to this study will cover the second part of the investigation: the maturity model dimensions.

2.4. The Maturity Model Dimensions

CMM has been found successful in sustaining the transfer of good performance in tasks (Herbsleb et al. 1994; Lawlis et al. 1995) and in responding to questions (SECAT 1998):

- Is the organization successful at learning from precedent faults?
- Is it obvious that the organization is spending limited resources efficiently?
- Does everyone have the same opinion about which problems within the organization are the main priorities?
- Does the organization have a clear view of how it will develop its processes?

The ELMM's dimensions and their contents are described in detail later in this chapter. Firstly, to help the reader conceptualize the ELMM, the hierarchical structure is presented as a flow chart in Figure 2.1.

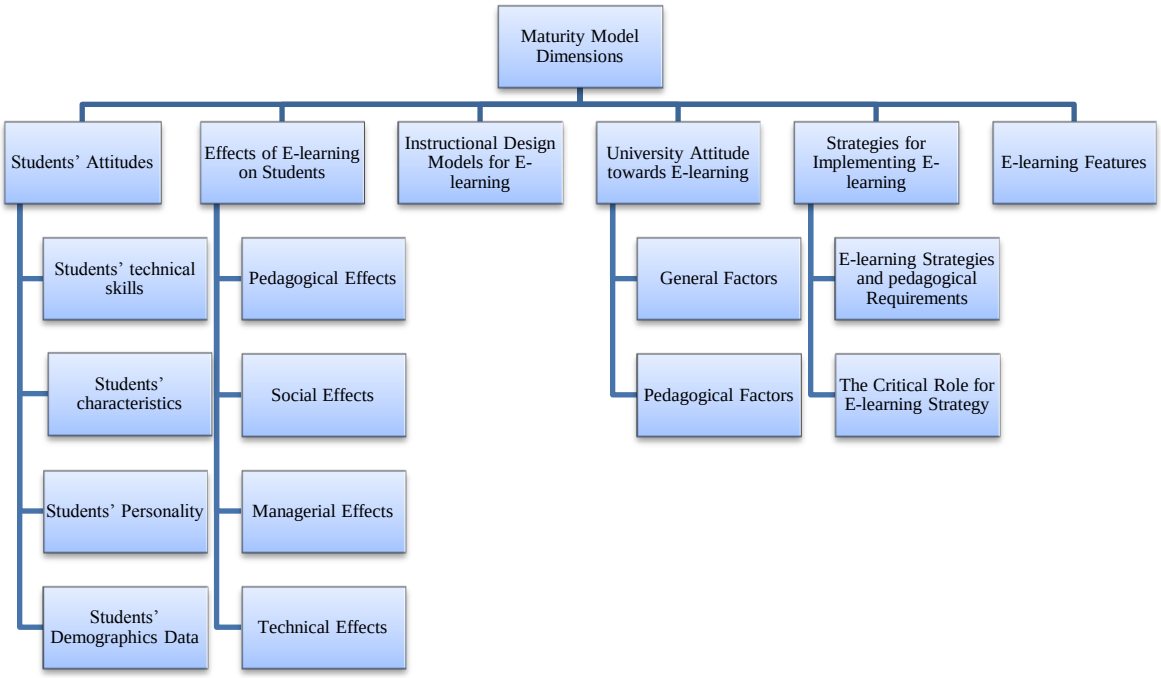


Figure 2.1 Literature Review Map

Figure 2.1 illustrates the layout of the literature review in a linear format where topic contained links to sub- topics. The map provides an overview of the literature review, using a series of interrelated blocks. The purpose of the review is stated at the top of the map and leads into the other blocks. Emanating from the ELMM block are the links to other dimensions, which help inform the literature review.

In the next section a review of the literature related to this study will envelop these dimensions in detail.

2.4.1 Students' Attitudes

Measuring attitudes towards e-learning has been the recognized objective of many researches which have approached different methodologies. There are two models which assess attitude: one created by Rosenberg and Hovland (1960) and the other by Fishbein (1975). The Rosenberg model is built on two variables: the perceived utility of the object and the value of importance. The Fishbein model offers a different perspective: proposing an analysis of attitudes through the consumer's beliefs and evaluations. Depending on the two previous theories, the technology acceptance model (TAM) was first formed by Davis (1989), based on the Theory of Reasoned Action (TRA) of Fishbein & Ajzen (1975) in psychology research. The TRA reports that individual behaviour is driven by behavioural intention, which is a function of an individual's attitude toward the behaviour and subjective norms surrounding the performance of the behaviour. In other words, it states that one's behaviour and the intent to behave is a function of one's attitude toward the behaviour and their perceptions about the behaviour. Therefore, behaviour is a function of both attitudes and beliefs (Masrom & Ismail 2008). TAM relies heavily on two beliefs, perceived usefulness and perceived ease of use, to determine behavioral

intentions. Perceived usefulness is the individual's belief that the technology will increase their job performance. Perceived ease of use is the individual's belief that the technology will be easy to use.

The occurrence of TAM in measuring attitude towards e-learning is very high (Bertea 2009). Similarly, Mishra and Panda (2007) redeveloped a scale composed of 12 items with the purpose of measuring faculty attitude towards e-learning. Also, Wangpipatwong et al. (2008), in a case study carried out at Bangkok University, report that the intention of using e-learning influenced students attitude towards computers and their perception of e-learning. These researches are based on a computer attitude scale developed by Lyod and Gressard (1984) and the Technology Acceptance Model (Davis 1989).

In the same context, one further study, conducted in Thailand by Lertlum and Papasratorn (2005), applies a methodology depending only on the Technology Acceptance Model (TAM). On the other hand, Paris (2004) modified CASS (Computer Attitude Scale for Secondary Students) from Jones and Clarke, (1994) to include web page reference instead of computer reference.

In Egypt, Wahab (2008) applied a questionnaire with 24 items, which measured on a Likert scale the attitude towards e-learning, the intention of adopting e-learning, the availability of e-resources, the ease of use, and the utility. Assessing students' attitudes has a significant function in this research for developing the e-learning maturity model because it can be seen from literature review that there is a significant relation between attitude and behaviour towards e-learning (Bertea 2009).

In the following section, the study explains the most important concepts which affect students' attitudes. Various concepts in the e-learning environment, and in the students' attitudes themselves, affect the way students learn; for example, students' technical skills, characteristics, personality, and demographics data. These factors have been explained in the next section.

Students' technical skills

Ray and Day (1998) ensure that a computer skills training is essential at a level which is appropriate to the individual needs of the student. This is supported by Haywood et al. (2004), who argue that students who are ICT-skilled hold positive views about e-learning. However, Keller and Cernerud (2002) found that students previously used to computers should not be estimated to be more positive about e-learning than other students. Lee (2003) reports that larger proportions of female students rated themselves as less skilled and less confident in computer use, and knew less software packages, than their male counterparts.

Tisdell et al. (2004) explain that computer skills are currently the main problem in e-learning. Therefore, students' computer skills are the subject of a study carried out by O'Donoghue et al. (2004), who found that students who are lacking in technology and software skills, are limited in

their performance levels. In the same context, Cotterill et al. (2005) ensure that the improvement of basic computer skills at the beginning of students' higher education experiences appears to be critical in providing them with the essential skills they require to be able to access e-learning with confidence.

Also, Mandernach et al. (2006) suggest that in order for e-learners to be successful, they must be comfortable with basic computer skills required to work within e-learning. Saadé et al. (2007) found that students with more IT experiences would have an advantage in managing e-learning courses over those who have little experience. Bertea (2009) agrees, going on to say that the essential abilities needed by a student entering an e-learning system include the use of writing software, internet browsing, and email. If these are lacking, learning effectiveness through e-learning diminishes, and the student has to face a stressful situation, which can turn cause disturbance and result in loss of self-confidence. Keengwe (2007) found a positive correlation between students' personal computer skills and their instructional computer proficiency.

Students' characteristics

Katz (2002) stated numerous students' characteristics for successful e-learning: positive self-image, independence, self-assurance, level of control, creativity and motivation. Similarly, Entwistle (2000) identified the following individualities: previous knowledge, intellectual abilities, learning style, personality, attitude towards the course, motivation, work habits and study skills.

E-learning is more appropriate to mature students because they do not generally need the social support that most younger students find essential (Osbourne et al. 2004). This is because mature students normally have a developed social circle, often including jobs, family unit responsibilities and friends, as well as or interests outside university (Carr 2000).

Hodson et al. (2001) report that motivational topics act as a dilemma for students using e-learning and they highlight the need for instructors to supply a series of learning opportunities with differing viewpoints in order to support deep learning and to ensure that students are engaged in the learning process with sufficient motivation to continue. Bozarth et al. (2004) have the same opinion, but propose that students have troubles with time administration. They also note that instructors have different prospect of students. Tutors expect students to have greater problems with computer skills and technical issues than with study skills. O'Donoghue et al. (2004) argue that "e-learning will create a better educated workforce and allow those in full-time employment to study for higher qualifications and improve their prospects".

Students' personality

Cotterill et al. (2005) point out to the necessity of a development tool for assessing student attitudes towards e-learning. For that reason, a recent study by Al Doub et al. (2007) revealed that culture appears to be related to students' attitudes to and use of e-learning materials. This is

supported by Saade et al. (2007) who ask whether student culture is likely to accept e-learning as a means for learning. Studies undertaken to explore the correlation between students' attitudes towards e-learning and their personality would suggest that student's personality affects performance.

Hodges (2004) mentions that an e- learning system should be designed to be relevant and dependable on perspectives for the learners' motivations. In the same context, reading comprehension, writing skills, communication skills and organizational skills will also have an effect on students' attitudes (Mandernach et al. 2006). Also, McMahon et al. (1999) found in their study that anxiety and lack of confidence interacted to prevent students from adopting computer usage. More students are taking e-learning courses and these students must have the willingness to ask questions and to stay engaged in tasks that may be confusing or challenging (Mandernach et al. 2006).

Students' demographics data

Bertea (2009) and Fancovicova and Prokop (2008) noticed little or no correlation between gender, age group, ownership of home computers, year of study, and attitudes towards e-learning. This is supported by Carswell et al. (2000), who state that neither age nor gender affected a student's choice to contribute in e-learning.

However, Rodgers (2008) says that, female students benefited less from e-leaning material than their male counterparts. Moreover, Bertea (2009) found attitude differences between employed and unemployed students. It was also mentioned that students' attitudes are affected by the amount of time dedicated to computer use. In the same context, Fancovicova et al. (2008) found a positive correlation between time spent with computers and attitudes toward e-learning. Saade et al. (2007) agree and go on to say that time allocation for e-learning is a problem for many e-learners. Buzzetto-More (2008) found a strong relationship between the amount of time spent online and plans to take a fully online course, reinforcing that one of the necessary skills for studying with e-learning systems is time management. Also, Mandernach et al. (2006) found that time management strategies are a key issue for e-learners.

Other problems were found in the Middle East, in particular the opinion was expressed that Middle Eastern students need to "learn how to learn." In other words, there is a fear that they lack the discipline required for self-paced learning. It is clear that, beyond an elite circle, most students in the Middle East do not know what e-learning is really about, or how it can be used to improve the quality of education. Even within educated circles, there is a big difference in depth of understanding as e-learning is still an evolving term in the Middle East. In the same context, it was expressed that e-learning is less effective and less desirable than traditional classroom training, and that those students who get their education that way will miss out on proper education. Thus, the importance of students' attitudes towards e-learning acts as a significant determining factor in the educational benefits of online learning resources and experiences. Moreover, students need to build a positive attitude towards e-learning, and this cannot be implemented unless the components of their attitudes were investigated and explored. Thus, in

this sector of the world the students' attitudes have a significant direct effect on intention to adopt e-learning in Middle East universities.

Although several studies have been conducted on exploring attitudes, only a few studies have divided attitude into behaviour, feeling and opinion. Also, there is no study that includes attitudes as a factor in the maturity model for e-learning. Moreover, it is worth mentioning that while several studies have been conducted on students' attitudes towards e-learning, very few have included instruments to evaluate maturity level of attitude towards e-learning. Thus, this dimension focuses on designing a uniform evaluating strategy for students' attitudes.

2.4.2 Effects of E-learning on Students

Buss (2001) states that in the United Kingdom, the National Learning Network (NLN) creates accessible self-assessment equipment to make classification of universities easy according to the extent to which information and learning technologies (ILT) have impacted upon them. In order to measure the level to which ILT has been embedded into teaching and learning, and to recognize priorities for development, institutions review their current state of maturation on 14 indicators, including strategic management, learning resources management, learner IT skills, and record keeping.

Furthermore, in the United States there is the *Quality on the Line* report (IHEP 2000), which is organized by The Institute for Higher Education Policy in collaboration with National Education Association and Blackboard. From an examination of the distance education literature, the report recognizes 45 initial issues of best practice, from which 24 standards deemed essential for guaranteeing high-quality distance learning are assembled. These benchmarks are classified under seven headings: institutional support, course development, teaching/learning process, course structure, student support, faculty support, evaluation, and assessment (Higher Education Academy 2008).

The Higher Education Academy and the Joint Information Systems Committee (JISC) are working together on a UK-wide higher education e-learning benchmarking exercise with a pilot that commenced in January 2006. The present spotlight of the exercise appears to be with regard to how universities are embedding different features of e-learning into educational policy and practice, and to supply universities with quantitative statistics and qualitative reasons on which to reflect, share experiences, and make informed strategies for future development (European Institute for E-Learning 2004).

In the following section, this study classifies the effects of e-learning as follows: Pedagogical Effects, Social Effects, Managerial Effects and Technical Effects.

Pedagogical Effects

E-learning extends students' knowledge sharing and information- building through interactive discussion outside the physical and temporal limits of the lecture room, through a wide range of

technological educational tools and communications platforms, such as emails and discussion groups, which allow asynchronous and synchronous interaction (Bell et al. 2002). In the same context, Chou and Liu (2005) found that students in an e-learning environment achieve better learning performance and report computer self-efficacy and satisfaction than their colleagues in a traditional environment.

Online participation and student grades are the subject of a study carried out by Davies and Graff (2005), who found a correlation between online participation and grades. The results of the study suggested that greater online interaction did not lead to extensively higher performance for students achieving passing grades; however, students who failed in their courses tended to interact less regularly. Buzzetto-More (2008) found that students find course websites to be helpful resources which enhance the understanding of course content. Rodgers (2008) says that e-learning plays an essential role in the success of any learning process. Also, he goes on to say that higher education should employ e-learning to promote teaching effectiveness and academic achievement, and the different learning styles should be taken into consideration.

Vovides et al. (2007) report that an e-learning environment can have possible added learning benefits and can help students develop self-regulation skills, in particular their metacognitive skills. Alexander and Golja (2007) identified several pedagogical effects from e-learning: tracking the improvement of ideas through the discussion groups; accessing course resources prior to lectures; checking marks and grades; asking questions when they arose rather than waiting for a face-to-face class, comparing their own understanding to that of other students through the discussion board, receiving updates on administrative and learning issues between face-to-face classes; and locating other learning resources via links provided.

Social Effects

O'Donoghue et al. (2004) state that the e-learning environment has proved to be advantageous for many shy students who were previously frightened by the traditional classroom, and often too worried to voice their opinions. Online chat-rooms have provided them with the self-confidence to do this. In the same context, Singh et al. (2005) state that e-learning can supply a model for students for how to become self-directed independent learners, which is needed in the Middle East. Steel (2006) states that e-learning is vital for students as it promotes conversation and communication between students, tutors and lecturers. Alexander and Golja (2007) found that, through e-learning students can get to know fellow students via discussion board.

Managerial Effects

Buzzetto-More (2008) goes on to point out that the online submission of assignments and the ability to check assignment grades online may encourage the development of students' managerial skills. Alexander and Golja (2007) identified several managerial effects from e-learning: registering in a course of study regardless of geographic location; receiving

announcements of changes or deletion of classes; and ask questions online that where they previously didn't feel comfortable in a face-to-face situation.

Technical Effects

Chou and Liu (2005) stated that students learning basic IT skills in e-learning environments have better learning effectiveness than their counterparts in traditional learning. Cotterill et al. (2005) found a relationship between students' IT capabilities and their perceptions of e-learning. Keengwe (2007) indicates that a relationship exists between students' personal computer skill and students' instructional computer ability.

While several studies have been carried out on quality assurance of e-learning, only a few have included measurement tools to evaluate the extent to which information and learning technologies have impacted upon students.

2.4.3 Instructional Design Models for E-learning

Roberts et al. (2000) identified four models of e-learning: (a) Naive model is the most broadly used and it may be characterized as notes on the web but it provides no chance for communication or comment; (b) Standard model which attempts to use the advantages of technology to allow a significant degree of communication and interaction between students and staff; (c) Evolutionary model which allows a response mechanism to give beneficial comments on how the subject is succeeding; and (d) Radical model, where students are formed into groups to learn by interacting among themselves, using the enormous amount of existing web- based resources.

Hewitt-Taylor (2003) highlights that transferring lecture notes to web- based systems, or any other e-learning tools may be a good way to display course material without dependence on mass lectures, which will enable teachers to focus their time on answering inquiring and critical questions that result in strength of learning. However, if the role of the teacher is not made obvious it is likely that teachers will become a non- essential facility and education will be reduced to the presentation of materials in a potentially uncoordinated way.

Chou and Liu (2005) suggest a model for e-learning which called Technology-mediated Virtual Learning Environment (TVLE). This model addresses the relationship between learner control and learning effectiveness. Partridge and Edwards (2005) have developed an on line learning system, called Reflective Online Searching Skills (ROSS), which responds to the need for student learning environments which support the progress of generic online searching skills achievement through reflective practice.

In the same context, Leitch and Warren (2008) provided a new realistic system, called the Method for Educational Analysis and Design (MEAD), designed for the development of e-learning and learning systems based upon students' participation approaches. Web- based virtual

learning environments (VLE) are the subject of a study carried out by Piccoli et al. (2001), who found learners in the e-learning environments reported higher computer self-effectiveness. Chou and Liu (2005) agree and go on to say that the students in the technology-mediated virtual learning environment (TVLE) have greater computer self-efficiency.

In Middle Eastern universities, the decision to develop an e-learning system is not one to be taken half-heartedly, nor should it be considered solely for reasons currently mooted in university settings; reasons which include attracting students, delivering courses more efficiently and effectively, and generating additional resources. A more important reason is that e-learning provides the right medium for content delivery, attracting students to self-paced learning (learn how to learn), and the appropriate teaching and learning environment for prospective students. Moreover, educational research and development into e-learning in Arab countries mainly focuses on the inclusion of new technological features without taking into account psycho-pedagogical concerns that are likely to improve a student's cognitive process in this new educational category.

Thus, this dimension explores students' perspectives about combining behaviourist, cognitivism and constructivist learning theories into e-learning. Therefore e-learning can best be understood in the broader context of using technology to meet students' psychological and cognitive needs for learning. It also requires Middle Eastern universities to understand that students have psychological needs that e-learning must address. Also, this dimension discusses established and emerging learning theories, the relationship between these theories and technology, and ways to help teachers to develop personal educational philosophies that guide their selection, implementation, and utilization of classroom technology.

Even though numerous studies have been conducted on e-learning models, very few have integrated Cognitivism, Behaviourism and Constructivism theories to evaluate which have impacted upon students.

2.4.4 University Attitude towards E-learning

Volery (2000) states that the fast growth of the internet and correlated technological improvements, in concurrence with limited financial plans and social demands for improved access to higher education, have produced a significant motivation for universities to introduce e-learning courses. Also, he reports that if universities do not adopt e-learning technology that is readily obtainable, they will be left behind in the pursuit for globalization. Ribiero (2002:23) argues that if universities are to exploit the potential of e-learning as a means of convening higher education, they must be completely aware of the serious success factors concerned with introducing e-learning. All these are topics that HEIs have to contend with in their endeavours to adopt e-learning.

O'Hearn (2000:7) contends that university structures regarding the incorporation of technological advancements. Holley (2000:35) states that e-learning is not easy to employ without the complete cooperation and support of lecturers as a degree of interaction between lecturers and students is still predominant in e-learning environments (Volery 2000:37). Long-established universities should be able to compete with other independent education providers in relation to social demands for 'lifelong learning' and globalised education services (O'Hearn 2000; 24).

In the following section, this study classifies university attitudes as follow: General Factors and Pedagogical Factors.

General Factors

Gerrard and Gerrard (2002) point out that some factors such as chance to take advantage of current teaching technologies, increase user-friendliness to courses offered, expand a global existence, keep up with shifts towards social inclusion, increase returns on existing resources and keep up with other universities and maintain a competitive position may be related to universities' attitudes towards e-learning. O'Neill et al. (2004) found that serious factors for success will change with the implementation of e-learning. Previous experience of the use of technology, the technological infrastructure, and the university lecturer will be the new key elements in the success of the learning experience.

Siritongthaworn and Donyaprueth (2008) go on to point out that some factors, such as a clearly stated e-learning policy for the university, the establishment of a formal e-learning unit that includes technical service and support to improve educational efficiency, and the perceived e-learning benefits to users, should include raising the awareness of e-learning technology before the actual implementation as it may be more effective for universities' attitudes towards e-learning.

Pedagogical factors

Bashar and Khan (2007) identified that balancing technological and pedagogical improvement is the key to e-learning success. Faculty Integration of Technology into Instruction is the subject of a study carried out by Keengwe (2007), who found that e-learning tools (e. g. multimedia presentation tools, web browsers and course management tools) should be embedded in classroom. The results of the study recommended that students need to have direct instruction to achieve proficiently use computer technology applications, such as authoring and complicated hypermedia. Also, he indicated the correlation between faculty integration of computer technology into classroom instruction and students' attitudes towards the effect of e-learning for improving their learning.

Another study carried out by Johnson et al. (2006), found that students reported falling self-assurance in their computer skills as they progressed through their educational program. The

results of the study suggested that faculty members would need to require their students to do coursework and assignments that would engage them in using the computer applications and applying the concepts and skills they learned in previous computer classes.

In the same context, Mishra and Panda (2007) developed an instrument that can be adapted to measure faculty attitude towards e-learning. Craig et al. (2008) identified that teaching staff need to be sensitive to students' expectations of them as online teachers and should make an effort to manage and meet those expectations. Also, a university will have a need for staff improvement to ensure that all staff possess the key skills in e-learning.

Middle Eastern universities have the responsibility not merely to provide e-learning for students but also to foster a culture of acceptance amongst the end-users of these tools. Hence, the study of lecturers' attitudes becomes indispensable to e-learning implementation plans. As Sheingold (1991, cited in North Central Regional Educational Laboratory, 2003) notes, the challenge of technology integration into education is more human than it is technological. To secure e-learning benefits in the Middle East, most universities will need strategies to make the necessary organizational changes and build up entrepreneurial attitudes and management skills for their staff. The success of e-learning is dependent on the attitudes of staff, with a positive attitude towards technology and strategy needed for its success. Wilson et al. (2001) suggests that three characteristics of the instructor will control the degree of learning: attitude towards technology, teaching style, and the control of technology.

The availability of lecturers alone is not sufficient for the successful adoption and implementation of e-leaning within Middle Eastern universities: attitudinal features should be considered as well. Commitment and a positive attitude towards e-learning from lecturers help to create a good environment for the positive implementation of e-learning which would subsequently yield positive results for students as well. In support of this view, Holley (2002) concludes that students will experience a more positive learning experience if guided by a lecturer who holds a positive attitude towards traditional learning whilst promoting e-learning methods.

Unfortunately, much of the early research on e-learning in the Middle East has ignored lecturers' attitudes towards e-learning. Modern studies have shown that the successful implementation of e-learning depends largely on the attitudes of lecturers, who eventually determine how they are used in the classroom. Bullock (2004) pointed out that teachers' attitudes are a main factor in the adoption of e-learning. Similarly, Kersaint et al. (2003) found that teachers who have positive attitudes toward technology feel more comfortable with its use and usually incorporate it into their teaching. In fact, Woodrow (1992) asserts that any successful transformation in educational practice requires the development of positive user attitude toward the new technology. The development of teachers' positive attitudes toward e-learning is a key factor not only for enhancing computer integration but also for avoiding teachers' resistance to e-learning (Watson, 1998).

To summarize, several studies have been conducted on exploring university attitude, but only a few in the Middle East have included measurement tools to evaluate the maturity level of university attitude.

2.4.5 Strategies for Implementing E-learning

In the strategic planning method used to apply e-learning or regulate existing e-learning, the focus should, therefore, not be mainly on how technology can be used to attain business objectives but also on the human aspects of teaching and learning (Engelbrecht 2003). Without a tactical plan, the temporary measurement of costs and return on investment may overshadow the longer-term benefits of e-learning as a means of producing knowledge workers (Rosenberg 2001).

In the following section, this study debates e-learning strategies from two perceptions:

E-learning strategies and pedagogical requirements

McMahon et al. (1999) found that increased concentration on student perception may lead to enhanced strategic planning in students' use of computers. Redfern and Naughton (2002) found that collaborative virtual environments enable innovative and valuable distance teaching techniques and should be based on the pedagogical requirements of the students' communities. Higgins (2002) agrees, and highlighting that e-learning will only be successful if it is based on sound educational approaches.

Bell et al. (2002) have identified that online education is affected by a range of issues, such as including the requirements and demands of the students; the appropriateness of the content to online provision; the bandwidth capability of the university; the cost efficiency of providing courses or units online; the attitude and tactical plan of the university; the individual knowledge of the required technology and software; availability of staff development courses; the accessibility and ease of use of course management systems; and the ability to maintain and expand online course materials within the university.

The critical role for e-learning strategy

Keller and Cernerud (2002) found that the strategy of implementing e-learning may play a critical function in developing students' attitudes towards the new technology. Engelbrecht (2003) agrees, and highlighting important issues that have to be evaluated and included in a strategic e-learning plan; such as knowing the needs of e-learner, designing and conveying quality learning resources, and creating communities of learners for knowledge building.

O'Neill et al. (2004) found that universities can help students to achieve success by taking a number of steps. Firstly, a face-to-face session familiarizing students with the course material will help to overcome issues relating to previous knowledge. Secondly, the functionality of the technological infrastructure should be ensured before the course is implemented. Finally, human resources should be committed to the project at an early stage and lecturers should be selected based on their attitude towards e-learning, teaching style and ability to control to technology.

In the same context, Cotterill et al. (2005) warned that e-learning should not be used simply for the sake of using it. Also, Elango et al. (2008) identified that e-learning strategies should depend on e-learners' observations with consideration given to the commitment of the institution providing e-learning, syllabus content, faculty support, students' commitment, delivery method, and evaluation and measurement of the e-learning system.

Who is responsible for e-Learning success in higher education is the subject of a study carried out by Wagner et al. (2008), who found that certain factors lead to successful strategies for e-learning. The results of the study suggested that the answer is to increase attention on the integrated factors rather than on just a single factor (e.g. students and instructors should provide feedback to develop future experiences; institutions should provide the technical infrastructure and support needed to enable inclusive solutions; technology providers should provide high quality solutions that consider learning principles; accreditation bodies should present and impose clear procedures; and employers need to recognize the authority of e-learning to guarantee that students meet the requirements of the job market). MacKeogh and Fox (2009) go on to point out that an e-learning strategy includes a clear idea of desired outcome, a perception of the current capacity and attitudes of the relevant staff, and a consistent set of steps to move from the current situation to the desired outcome.

Weak strategies for e-learning have existed in most of the Middle Eastern universities. Therefore, defining strategy is critical to the successful deployment of e-learning initiatives in Middle East and Arab countries. To define successful e-learning strategy, they need to understand the potential benefits and issues offered by e-learning, thus helping them to manage the issues wisely, so that they may reap the benefits. On the other hand, failure to develop a successful e-learning strategy and poor management will undermine the effectiveness of e-learning. Lastly, e-learning strategies will require Middle Eastern universities to cater for differences in students' attitudes by determining preferences to select the appropriate learning strategies.

Whereas several researches have been conducted on e-learning strategies, only a few studies have included a measurement tool to evaluate maturity level of these strategies.

2.4.6 E-learning Features

A key component of the shift towards student-centred learning in Middle Eastern universities is the increased adoption of e-learning by higher education institutions. Studies of e-learning draw to some extent on the constructivist theory of learning which emphasizes reflection on the learning experience (Jonassen et al. 1993). The widespread adoption of e-learning is somewhat based on the notion that e-learning has the capacity to cater for different learning styles, and to enhance collaboration between students and communication between students and lecturers (Lin and Hsieh 2001). Extant work in this area has noted that e-learning facilitates students' subject knowledge (Cameron 2002), promotes deep learning (Ramsden 1992), facilitates group work (Hartford 2005), and provides a platform for individuals who are apprehensive in face-to-face interaction to engage more with others (Hobbs 2002).

Thus, Kandies and Stern (1999) have reported that e-learning improves instruction and course management and supplies several pedagogical benefits for students. They point those students in e-learning environments becoming more dynamic and self-directed learners when they are exposed to enhanced e-learning materials. Moreover, e-learning has proved to be an effective means of supplying numerous learning resources, with students responding positively to the quality resources it makes available. Wernet, Olliges, and Delicath (2000), who surveyed students who used e-learning, reported that all of the students considered the electronic materials useful to their overall learning experience. Also, Sanders and Morrison-Shetlar (2002) investigated student attitudes with respect to the e-learning component in a general biology course. Their results showed a positive effect on student learning, problem-solving skills, and critical thinking skills, with females responding more positively than males. Therefore, Derouza and Fleming (2003) compared undergraduates who completed electronic exams with students who took traditional paper-based quizzes, finding that the grades achieved by students who took quizzes online significantly outperformed those of students who took traditional quizzes.

Despite the potential benefits of the adoption of e-learning, its use for module delivery has not escaped critique (Ituma 2011). For instance, Evans et al. (2004) argue that the exclusive use of e-learning may not achieve effective learning outcomes. They point out that simply uploading lecture slides onto the web does not enhance students' learning experience. They argue for the need to move beyond this basic usage to a more innovative blended system that provides students with new types of learning experience. Along similar lines, Singh (2003) argues that 'a single mode of instructional delivery may not provide sufficient choices, engagement, social contact, relevance, and context needed to facilitate successful learning and performance' (p. 51). Exclusive use of e-learning has also been found by Cooper (1999) to be of limited benefit in catering for students' divergent learning needs, given the likelihood that some students may have inadequate skills for independent learning, which is one of the hallmarks of e-learning. As such, Voigtlander (2002) calls for careful planning in the implementation of e-learning, given that teaching and learning styles are idiosyncratic.

From a slightly different perspective, scholars (for example, Abrahams 2004) argue that the continual updating and maintenance associated with the use of e-learning can be very time consuming. This notion is supported by the empirical study of O'Neill et al. (2004), which found that lecturers spent twice as much time managing an online course as they would on a face-to-face course. Other limitations of e-learning relate to the lack of agreement on what good online pedagogy is, and the resistance to change amongst academic staff (Fernandez 2005; Keaster 2005). This somewhat contradictory conclusion reached by the different studies on e-learning can be partly explained by the type of e-learning technology adopted, students' learning styles, educational background, and the nature of the discipline in which e-learning is being applied. These factors may affect the adoption and effectiveness of e-learning in any particular context.

Despite the mixed evidence on the perceived effectiveness of e-learning, there is a growing consensus among contemporary e-learning scholars (O'Neill et al. 2004; Singh 2003) that in order to address some of the limitations associated with the exclusive use of e-learning, there is a need to adopt a more 'blended' approach to learning. This has given rise to the notion of blended e-learning, which refers to the combination of different modes of delivery, models of teaching and styles of learning (Heinze and Procter, 2004). Blended e-learning typically consists of the use of e-learning options and media to complement traditional classroom learning activities. This

approach to learning has been found by scholars (Dowling et al., 2003; Garrison and Kanuta, 2004) to enhance learning and imporve students' satisfaction. Although blended learning offers a great deal of scope for the combination of different delivery methods, in recent times it has been the integration of e-learning with more traditional approaches to teaching that has gained much more currency than any other learning method combination.

Whilst extant research on e-learning has undoubtedly increased our understanding of blended e-learning, a common concern is that mainstream studies in this area have focused largely on the adoption of e-learning and the challenges of its implementation in higher education (Cornford and Pollock 2003) and on staff experience of e-learning (Rossman 1999; Trigwell 1995). In this respect, the students' perceptions of e-learning, particularly in campus-based universities, is a relatively neglected and little understood area of inquiry (Alexander 2001; Keller and Cernerud 2002; Sharpe et al. 2005). The few extant e-learning studies that have explored the students' perspective have found that the perception of e-learning is somewhat influenced by gender. Keller and Cernerud (2002), for instance, found that gender affected the attitude of Swedish students towards the use of computers as a teaching device, with female students having a more positive attitude to e-learning than their male counterparts. Similarly, Selwyn (2008) found significant gender difference in students' usage of the internet for academic purposes, with female students being more likely to use the internet than their male counterparts. These findings suggest that gender can affect the perception and usage of e-learning. However, the generalizability of these findings to specific e-learning platforms has not been clearly established. Perhaps not surprisingly, there has been a growing call from e-learning scholars for studies that explore students' perceptions of e-learning systems, to enable instructors to develop a better understanding of students' experiences in order to enhance their satisfaction and performance (Klimoski 2007).

In Middle Eastern universities, facilitating learning by ICT can be mixed mode, web assisted or fully online in very rarely cases. However, regardless of the delivery technique, there are numerous tools and features at the disposal of students and instructors, and it is important for the e-learning community to examine both preferences and use of these features. In Arab Countries, e-learning is used to facilitate the face-to-face learning process in many universities. There are many features and tools that shape and influence a student's perception of e-learning. Although various researches of e-learning have provided interesting insights into its potential benefits, a common concern is that mainstream researches in this area have focused largely on lecturer attitudes and experience, with limited attention paid to students' perceptions and engagement.

Thus, this dimension explores the pattern of use of a typical e-learning system by students in a college of applied science at Middle East. Also, it goes some way towards filling this gap by exploring students' perceptions and patterns of use for a typical e-learning system. In the same context, it investigates whether there is a relationship between the perception of a student regarding the e-learning features and their actual usage of a BlackBoard system. It is believed that this will help provide a better understand of student usage of an e-learning system. Therefore, it builds on the findings of a number of studies that have examined student e-learning experiences, perceptions, and preferences at major institutions in developed countries. Finally, this dimension contributes to knowledge by examining precisely at student behaviours of e-learning features.

2.5. Summary and Conclusion

Consideration of the CMM approach led to the initial ideas behind the electronic Maturity Model (eMM). However, this has been enhanced by later work (Marshall & Mitchell 2003; 2004), which builds on the related SPICE (Software Process Improvement and Capability Determination) framework (SPICE 1995). On the other hand, the maturity model in this research differs from the CMM and eMM in that it organizes the capability evaluation around six areas derived from mixed methods research design (exploratory sequential design –qualitative phase) and literature review. These six areas are listed in Table 2.1.

Dimension	Brief description
Students' attitudes	A hypothetical construct that represents an individual's degree of like or dislike for e-learning.
Effects of e-learning on students	Evaluate the extent to which information and learning technologies have impacted upon students.
Instructional design models for e-learning	The direction provided within e-learning, including Constructivism, Behaviourism, and/or Cognitivism.
University attitude towards e-learning	It could be explained as obstacles to the faculty's contribution to e-learning.
E-learning Strategies	A set of strategic goals or objectives that need to be achieved with e-learning.
E-learning features	Exploring students' perceptions and patterns of use of e-learning features.

Table 2.1 Definitions of Factors

One of the reasons why doubt remains over the usefulness of e-learning and its impact on student learning outcomes (Conole et al. 2000; Hewitt-Taylor 2001 is that the research supporting e-learning is fragile and subject to methodological flaws (Phipps & Merisotis 1999; Mitchel 2000; Conole et al. 2004). Unfortunately, statistical data relating to e-learning approaches are few and far between.

In this chapter after reviewing all these researches in terms of e-learning maturity model, the nature of the e-learning maturity model (eMM) is explored. This has been achieved through exploring the history, the varying definitions, and essential characteristics of e-learning. eMM is defined and interpreted by many authors in different ways. Therefore, it is understandable that scholars have various and complex views on the nature of eMM. Thus, a new definition for the eMM is presented in this study. The proposed definition is defining eMM as:

"*An approach of using new combination and integration of dimensions in the evaluation process for e-learning* ".

The evaluation of the potential of e-learning represents one of the most important factors that control its diffusion and success in the institutions of higher education. Providing universities with the instrument tools, as well as making them aware of the rank of e-learning would help in improving their levels toward e-learning.

In the Middle East and in this present study, it was expected that most universities would not have a uniform evaluating strategy toward e-learning (Abdel-Wahab 2008). The review of literature stressed the need to use the maturity model to create instruments for e-learning assessment. The maturity model was identified as a necessary prerequisite and future step for preparing universities for e- learning environments. Thus, the model provides both a roadmap for improvement of process capability and a means of measuring e-learning maturity; whilst on the other hand, it is mainly focused on inputs rather than on outputs such as student learning (Twigg 2001).

Possibly the most significant conclusion to be drawn from this literature review is that we do not have an instrument to measure our maturity level in e-learning in the Middle East. Thus, this research tries to produce a maturity model (framework) that can attempt to develop tools for the assessment of e-learning which are informed by the success of process maturity approaches in software engineering. Therefore, we will have a model for e-learning that does not depend on technical details but rather concentrates on the ability of the organization and individuals to be effective. Moreover, this maturity model will try to address the challenges faced by e-learners in the Middle East region.

In the next chapter the survey scales are developed based on exploratory sequential design and the discussed literature reviews (Table 2.2).

Scale	Reviewed literature
1.E-learning models	(Mishra & Jain 2002); (Partridge & Edwards 2005); (lefoe 1998); (Modritscher 2006); (Nam & Smith-Jackson 2007); (Hodges 2004); (Ghaleb et al. 2006); (Alderman & Milne 1999)
2. E-learning features	(Ituma 2011)
3.E-learning strategies	(Marshall & Mitchell 2007)
4.University attitude towards e-learning	(Mishra & Panda 2007); (Sharma 2006); (Lertlum & Papasratorn 2005); (Elango et al. 2008)
5.Students' attitudes towards e-learning	(Jones 2007); (Francis 1993); (Paris 2004); (Seyal 2002)
6.Effects of e-learning on students	(Elango et al. 2008); (Chou & Liu 2005); (Buzzetto-More 2008)

Table 2.2 Scales from Literature Review

Chapter Three Research Design and Methodology

3.1. Introduction

This research study is primarily exploratory in that it aims to develop an understanding of recent changes that have occurred in the deployment of e-learning in Middle Eastern universities. Six factors (i.e. students' attitudes towards e-learning, effects of e-learning on students, method of e-learning implementation, university attitude towards e-learning, e-learning features, and implementation of e-learning strategies) contributed to changes in the number of elements that control the diffusion and the success of e-learning in the institutions of higher education. These factors are explored and measured through a mixed-methods study, incorporating both qualitative interview and survey data analyses.

Chapters One and Two identified the purpose of this study and the research questions that guided it. Chapter Three sets out the theoretical structure and outlines the phases of research, with the steps that were taken in order to address the research questions described in detail. Also, the methods of data collection are presented and this is followed by an explanation of the procedures which have been used for data analysis. Many theoretical issues influencing data collection are also discussed. This study focused on exploring the maturity model for e-learning in Middle Eastern universities. Thus, it has tried to explore the factors which help to create a maturity model for e-learning, which could be used for evaluating e-learning.

3.2. Familiarizing with Research Idea

The absence of an instrument to measure the rise and fall of e-learning is one reason for this exploratory sequential research. Thus, the purpose of this study is to design a uniform evaluating strategy for e-learning within the Middle Eastern community. Using a multi-methodological research approach, this research provides a model for e-learning evaluation within the context of a maturity model of e-learning, supporting a comparison of how universities evaluate the maturation level of e-learning. Six factors (i.e. students' attitudes towards e-learning, effects of e-learning on students, models of e-learning, universities attitudes towards e-learning, e-learning features and e-learning strategies) contributed to changes that have occurred in the deployment of e-learning in Middle Eastern countries. These six factors will be discussed in relation to the methodology in the following sections.

Students' attitudes towards e-learning

Al-Khashab (2007) examined a number of respondents to find out about students' attitudes toward e-learning in Kuwait. The outcome confirms that there are considerable differences in the attitudes towards e- learning based on learning level, also stating that Kuwaiti students usually have positive attitudes towards e-learning. In the same context, another study conducted by Al-Doub et al. (2008), in the Kuwait College of Business Studies, have showed that students were

keen to use e-learning and that there are some significant differences between male and female students in their attitudes to use of e-learning resources.

While several studies have explored attitudes towards e-learning, only a few studies have included surveyed the e-learners in their sampling frame and focused on the three basic elements of attitudes-cognitive (judgments or ideas segments), affective (feeling segment) and behavioural (an intention to behave in a certain way or direction) (Rosenberg & Hovland1960)-. Consequently, this study focuses on obtaining the perceptions of the end-users through the previous method.

Effects of e-learning on students

Buzzetto-More (2008) examined students' perception of different e-learning components by designing a web-based Course Management System. The results state that students find course websites to be cooperative resources that improve the acceptance of course content. In the same context, O'Neill et al. (2004) state that e-learning can supply a model for students for how to become self-directed independent learners. Steel (2004) states that e-learning is essential for students as it promotes conversation and communication between students, tutors and lecturers. Also, Alexander and Golja (2007) found that through e-learning students can get to know fellow students via discussion board. Finally, it is obvious from this debate that researchers across the world have studied the e-learning usage and adoption. It can be summarized that e-learning is becoming recognized as a vital component for today's education.

Although these studies have been conducted on e-learning, but they have not included a measurement tool to evaluate the extent to which information and learning technologies have impacted upon students. Thus, this study fills this gap and the results of this research will contribute to the knowledge.

Models of e-learning

The Organization for Economic Cooperation and Development (OECD 2005), in its report on the use of e-Learning in higher education, differentiates between four different stages, depending on how embedded the e-learning tools are in courses. There are: a) Web complemented courses focus on classroom-based teaching but include components such as putting a course outline and lecture notes online, and the use of e-mail and links to online resources; b) Web- dependent courses require students to use the Internet for key elements of the program such as online discussions, assessment, or online project/collaborative work, but without significant diminution in classroom time; c) Blended- mode courses, where the e-learning element begins to overtake classroom time; and d) fully online courses, where students can follow courses offered by a university from another city.

The use of e-learning is generally focused on supporting the subject content. However, the impact of combining e-learning in teaching can be evaluated through student engagement,

differentiation and creativity, although the impact of e-learning is very reliant on how it is implemented. Most of decision makers typically view e-learning as an important tool for educational improvement but not many of them really experience this impact (Elnord 2006).

Universities implementing e-learning must appreciate that students will respond differently to the shifting paradigm of learning and rather than implement changes across the board, should aim to offer courses tailored exclusively towards the different learning methods. In failing to take such action, universities run the risk of low success rates and at worst, failure (O'Neill et al. 2004). Thus, it is very important to design a tool for measuring the effects of e-learning.

If e-learning is to have a significant function in higher education in fostering quality student learning then it is important that universities firstly investigate how the e-learning will be implemented within their institutions; and secondly, engage in an open conversation with students to recognize their attitudes and expectations regarding the function of e-learning within their higher education experience (Partridge & Edwards 2005). The current research has taken a small step towards exploring these two points. Initially, it has provided a detailed methodology for exploring how e-learning is being applied within undergraduate students, and, secondly, it has measured the attitudes and expectations of students regarding the current and future role of e-learning.

Moreover, learning theory includes philosophies that aim at explaining changes in human performance, providing a set of instructional approaches, tactics and techniques from which to select, as well as the foundation for how and when to select and combine the strategies. Furthermore, it forecasts the results of using the strategies (Yang 2004). In the same context, in the *behaviourist learning model* students rely on instructors for knowledge at the beginning of any learning activity. From a behavioural perspective, educators operate and adjust the learning environment depending on the preferred outcome (Skinner 1971). Conversely, with the *Cognitivism model*, instructors set the objectives of the learning process and the students are expected to attain them. During the input process, the instructor breaks the content down into smaller pieces, steps, and designs in advance, which is a device used to perform each step more efficiently. In the output process, the instructor assesses the students to see whether they have achieved the learning objectives (Vrasidas 2000). However, the *Constructivist learning theory* has sought to create learning environments that come closer to actual life environments. As a result, constructivist educational methods have long been applied, particularly in information systems (Franck 2005). Many educational researchers argue that the constructivism theory offers a theoretical and practical foundation for e-learning procedures, especially the online type of e-learning (Bransford 2000; Weigel 2002).

This idea, which compares the e-learning using different learning theories, aims to measure students' awareness toward three learning theories have influenced on education: Behaviourism, Cognitivism, and Constructivism. They offer majors themes in the way learning is

conceptualized and provide different practical strategies for educational practices (Baruque & Melo 2004).

Although several studies have been conducted on e-learning models, only a few studies have included a measurement tool to evaluate the extent to which models and/or theories have impacted on students. Even though many studies were conducted on the learning theories, fewer research studies have investigated how learning theories can be embedded in e-learning.

Universities attitudes towards e-learning

The structure of higher educational universities is the biggest issue. The nonflexible organizational structures has changed partly due to the introduction of technological plans. Scott (2000) states that contemporary institutional structures are less robust than in previous years. In addition, he goes on to say that technology in general has not only enhanced knowledge storing methods and learning methods but has also acted as a mechanism to combat the obstacle of nonflexible organizational structures. Darling (2002) agrees and goes on to say that such a wide approval of e-learning methods in higher educational institutions will create wide-ranging effects regarding organizational structure. Universities are currently experiencing differences relating to the acceptance and integration of e-learning and other technological modifications into their organizational arrangements (Shabha 2000). Shapiro (2000) suggests one of the obstacles facing traditional universities planning to convert organizational structure to include technological modernizations is coming to terms with the process design for e-learning courses.

Although several studies have been conducted on exploring university attitude, only a few studies in the Middle East have included a measurement tool to measure university attitude. In order to speed up the acceptance of e-learning and its implementation in universities, it is significant to understand the university attitude and consequently develop a map for managing the change process.

E-learning Strategies

E-learning strategies can be assessed using several criteria and techniques. This requires the explanation of frameworks and forms to drive such evaluation. There are some frameworks have been developed to standardize the evaluation of e-learning. However, a general problem is the shortage of benchmarks to provide a formal reference in the analysis and comparison of e-learning.

E-learning Features

Empirical exploration of e-learning features will go some way towards deepening our understanding of students' perceptions of e-learning and optimizing the design of modules that can enhance their learning experience and performance.

The e-learning platform that forms the context of this dimension is a standard system that contains very similar components to the more general e-learning platform used by most of

universities. This has the potential to enhance the generalizability of the findings beyond the specificities of this particular e-learning platform. This platform is used by students for accessing digital resources and communicating with fellow students and tutors. It contains multiple communication and assessment tools, such as online discussion forums, chat rooms, and highly interlinked online learning pathways which can be customized for individuals and groups. Thus, this dimension contributes to knowledge by exploring how these features could be organized.

3.3. The Philosophical Orientation of the Study (philosophical Worldviews)

Research philosophy and methodology conduct research design and method (Easterby-Smith, Thorpe & Lowe 1991). Thus, pragmatic or world view is essential to all aspects of how the researcher decides the following: what is involved in the research, how to research it, which kind of data will be collected, and how to analysis that data.

Creswell and Plano (2011) stated that there are four worldviews: a) postpositivism, as a worldview, it is normally associated with quantitative approach; b) constructivism, typically associated with qualitative approaches, where the investigator works "from the bottom up" using the participants' views to build broader themes and generate a theory interconnecting the themes; c) participatory, which is influenced by political concerns; and d) pragmatism, which is typically associated with mixed methods research, with an approach that may combine deductive and inductive thinking as the researcher mixes both qualitative and quantitative data.

Creswell (2009) identified numerous distinctive features for pragmatism: pragmatism applies to multi-methodological research in that researchers draw liberally from both quantitative and qualitative theories employed in their research, and are free to decide on the methods, techniques, and procedures of research that best meet their needs. For multi-methodological research, pragmatism opens access to multiple methods, different worldviews and different theories, as well as different forms of data collection and analysis.

According to these properties, pragmatism is a method, therefore, instead of focusing on techniques; researchers concentrate on the research problem and use all techniques available to recognize the problem (Rossman & Wilson 1985). Pragmatism increasingly overruled clearness (Rossman & Wilson 1985) as the perceived advantages of integration methods in "getting research done" came to be accepted as balancing the meaning of the philosophical complexities in their use (Miles & Huberman 1994). The idea of pragmatism declares that researchers should use the approach or combination of approaches, that works best in a real world case. "In short, what works is what is useful and should be used, regardless of any philosophical assumptions, paradigmatic assumptions, or any other type of assumptions" (Johnson & Christensen 2004).

In order to meet the objective of this study, which concentrated on exploring a maturity model for e-learning, in the Middle East at a given time, the researcher needed to gain an

understanding of the maturity model dimensions using mixture of approaches that work best in a real world situation. Pragmatism philosophy depicts the required approach.

In the following section, the relation between research purpose and research methodology will be explained.

3.4. Purpose of Study

This thesis was interested in exploring a uniform maturity model for e-learning at Middle Eastern universities through the design of an innovation model called the e-learning maturity model (ELMM). In the same context, this research study has a number of interconnected objectives set within the context of higher education:

1. Investigate the dimensions of a maturity model for e-learning;
2. Explore guidelines that can be applied for evaluating e-learning deployment;
3. Critically evaluate the maturity model;
4. Investigate the framework relevant to supporting and evaluating e-learning; and
5. Explore views and practices related to e-learning preparation, including attitudes and barriers.

Exploring the maturity model for evaluating e-learning was highlighted by a number of articles discussing various aspects of e-learning; for example, the two- dimensional maturity model called the IT-Aligned Learning Maturity Model (IA-LMM) that assesses the organizational IT infrastructure and e-learning ranks (Fernando 2005), reviews the concepts underlying benchmarking and its application to improving the use of e-learning internationally (Bacsich 2005a) and the model derived from the CMM, called the Online Course Design Maturity Model (OCDMM) (Neuhauser 2004). Further reading of the researches identified a collection of issues of which e-learning quality was only a small element, and led to recognition that e-learning evaluation is a complex procedure: more complex than learning in a conventional sense since the technological tool adds another level of complexity. From the literature it was decided to explore some of the dimensions that would seem to compose the e-learning maturity model implemented in Middle Eastern universities.

A valuable aspect to this research work relates to the creation of a maturity model for e-learning: the opportunity to study e-learning maturity model and its implementation in practice. Although creating much debate and require, is in terms of implement and research within the university community, in its developing stages (Farrell 2001; Straub 2002). The need for quality advancement of e-learning in practice was acknowledged by The Commission of the European Communities (2002, p.11) when it stated that “the market for quality e-learning services and products needs to be encouraged to develop in a way that is sustainable. This implies that issues such as intellectual property rights (IPR) and funding models for schools need to be addressed” The idea, therefore, to gain a tool can assist in the assessment of e-learning deployment not only

to the study of e-learning as a phenomenon but also to a richer understanding of what the e-learning maturity model is.

Chapter 2 ("Literature Review ") identified a gap in existing research. This gap has been appeared by evidence of the need for assessment tools for e-learning. An important contribution of this research work will be the study and analysis of empirical data on how to create a maturity model for an e-learning environment which can be used in evaluating e-learning. This objective takes this research one step further through the collection and analysis of empirical data obtained from a university environment. Importantly, although a highlight of the empirical work will be to gather data on dimensions of maturity model for e- learning within a university setting, this will provide the opportunity to explore the assessment mechanism of e-learning provision in developing countries. By comparing theory with practice - i.e. comparing the Literature Review findings with the real world we will gain a fuller understanding of the issues surrounding the implementation of e-learning in the Middle East, and so be better placed to contribute useful knowledge in relation to e-learning in the university environment. Also, the review of literature revealed that there is a growing need for in-depth exploratory research into e-Learning assessment. For example, in an Interim Report on e-Learning, The Commission of the European Communities (2002), emphasized, in three of the ten identified key e-learning challenges, that "decision makers need relevant benchmarks and indicators", "the market for e-learning content needs to be developed" and "emphasis must now be placed on quality, standards and pedagogy" (p. 11), thus reflecting the importance of having an assessment tool for e-learning.

Thus, similar to an “e-Learning Maturity Model” or eMM (Marshall & Mitchell 2002; 2003; 2004) which merges the Software Process Improvement and Capability Determination (SPICE) framework with a set of practices derived from the educational institutions and the findings of On-Line Learning Environment (Cohen & Ellis 2001), this study will be conducted to determine key factors that have influenced recent changes in deployment of e-learning in the Middle East and create a uniform evaluating strategy for e-learning depending on new concepts and methodology which includes integration and innovation for the new six factors. Also, the implications of these factors suggest the development of robust e-learning.

Two research questions guided this study:

Research Question 1: What are the criteria affecting the introduction of a maturity model in the deployment of e-learning in Middle Eastern countries?

Research Question 2: To what extent could these criteria measure maturity level in e-learning?

The general inquiry of this research was, therefore, an exploration of the most important dimensions, or combination of dimensions, that seemed to compose the maturity model of e-learning from staff and learners’ perspectives.

Thus, the next section will provide the details of the research strategy adopted to address the research subjects identified above, together with the means of collecting data for analysis, including sample selection, and the analysis approach to be adopted.

3.5. Research Methodology

Wellington (1996) has defined methodology as a kind of "activity or business of choosing, reflecting upon, evaluating and justifying the methods you use." Also, the Oxford Dictionary of Sociology (2005) defines methodology as the "methods and general approach to empirical research of a particular discipline, or even a particular large study." Creswell (2009) agrees and summarizes strategies of inquiry as "types of qualitative, quantitative and mixed methods designs or models that provide specific direction for procedures in research design."

In the same context, Burns (2000) defines research as "a systematic investigation to find answers to a problem". In looking for answers such a systematic investigation (e.g. exploring a maturity model as the assessment mechanism of e-learning provision in developing countries) usually takes one of two methods: a) the scientific method or b) the naturalistic method (Miles & Huberman1994; Burns 2000). These differing ways of viewing social reality use different methods of explanation (Burns 2000; Cohen et al. 2000). The scientific approach applies quantitative methods, whereas the naturalistic approach applies qualitative methods, focusing on the knowledge of individuals within specific perspectives (Merriam 1998; Burns 2000; Cohen et al. 2000).

Creswell and Plano (2011), however, stated that exploratory design is a two-phase sequential process that can be recognized because the researcher begins by qualitatively exploring a subject, before moving on to a second, quantitative phase. The primary reason for the exploratory design is to generalize qualitative findings based on a few individuals from the first phase to a larger sample gathered during the second phase. The exploratory design is most useful when the researcher wants to generalize, assess, create instruments, or test qualitative exploratory results to see if they can generalize to a sample and a population.

The question now is which type of research methodology with academic evidences is best suited to gain a richer understanding of a maturity model for e-learning in a complex setting, such as a university environment?

- Historical research, as a strategy, is not suitable for this research work as it is normally associated with looking at non- modern phenomena (this research is interested in a modern phenomenon- e-learning).
- Experimental research is also unsuitable, as it separates a phenomenon from its social environment. Also, survey-based research fails to address in depth a diversity of e-learning issues.
- Action research has an advantage in that it involves in-depth collection and analysis of a problem that is current and can best be resolved by close relationship between the researcher

and those concerned in the problem region. Such an approach is iterative in nature, whereby data is collected, analyzed, the problem is revisited, more data is collected, analyzed further, the problem is re-examined again, and so on, until an agreed solution to the problem is accomplished. However, this research work is not involved with one specific practical problem that can be treated in this way: instead it is concerned with exploring a number of e-learning issues related to evaluation and implementation, not in solving an obviously defined practical problem. Hence the emphasis on securing a diversity of ideas, not on testing a theory iteratively to find a solution to a specific problem.

- Correlational research is designed to examine whether or not there is a relationship between one or more variables.
- Descriptive research attempts to express a situation, problem, and phenomenon or illustrates attitudes towards an object.
- Exploratory research is carried out with the purpose of investigating an area where little is identified (Kumar 2005).

The type of this research used in this study can be looked at from three different perspectives. From the application perspective, this research is pure research where it is developing a methodology and instrument to assess the maturity level of e-learning. From the objectives perspective, this research study is descriptive, correlational, and exploratory in that it is primarily designed to: a) investigate whether or not there is a relationship between six factors and e-learning maturity model; b) attempts to describe factors which have influenced the deployment of e-learning; and c) exploring a uniform evaluating strategy for e-learning. From the mode of inquiry perspective this research adopts a mixed methodological approach, rather than solely qualitative nor quantitative. The exploratory research in this study is interested in an in depth study ("explore dimensions of a maturity model for e-learning"), within a real university environment, of a number of interrelated objectives: explore students' attitudes towards e-learning, discovering effects of e-learning on students, how the e-learning will be implemented, what capabilities required by universities in adopting e-learning, and what philosophy and strategic plans for implementing e-learning are, and how this model will be used for assessment e-learning.

Thus, this chapter arranges the theoretical framework and outlines the stages of research. The steps that were taken in order to address the research questions, "What are the criteria affecting the introduction of a maturity model in the deployment of e-learning in Middle Eastern countries? And to what extent could these criteria measure maturity level in e-learning?", are explained in detail. The methods of data collection are presented and clarified. This is followed by an explanation of the procedures used for data analysis.

The research methodology and contents are described in detail later in this chapter. Firstly, to help the reader conceptualize this process, the hierarchical structure is presented as a flow chart in Figure 3.1 below.

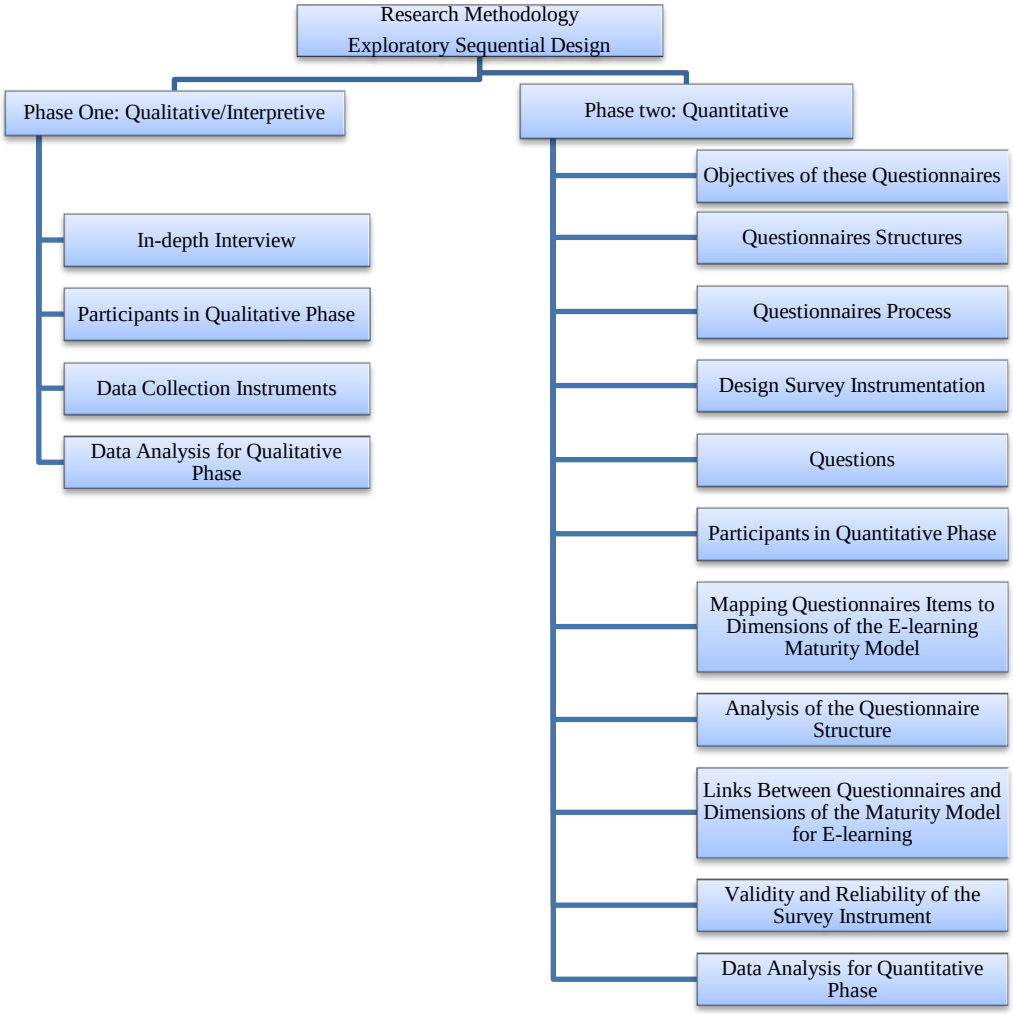


Figure 3.1 Research Methodology Map

Figure 3.1 illustrates the layout of the research methodology in a linear format where each topic contains links to sub- topics. The map provides an overview of the research methodology by using a series of interrelated blocks. The methodology is stated at the top of the map and leads into the other blocks.

The next section spotlights the enquiry mode.

3.5.1. The Nature of Qualitative Research

Bryman (2004) suggests that qualitative research follows a set of procedures: general research question, selecting relevant subject, collection of relevant data, interpretation of data, conceptual and findings, also there is bidirection between interpretation of data and theoretical work. He goes on and defines qualitative research as the following: “qualitative research usually emphasizes words rather than quantification in the collection and analysis of data. As a research

strategy it is inductive, constructionist, and interpretivist, but qualitative researchers do not always subscribe to all three of these features."

Creswell (2009) agrees and defines qualitative research as a "means for exploring and understanding the meaning individuals or groups ascribe to social or human problems. The process of research involves emerging questions and procedures; collecting data in the participants' setting; analyzing the data inductively; building from particulars to general themes; and making interpretations of the meaning of the data." According to Strauss and Corbin (1990, p. 19) "qualitative methods can be used to uncover and understand any phenomenon about which little is yet known".

Hoepfl (1997) adds that "qualitative methods are appropriate in situations where one needs to first identify the variables that might later be tested quantitatively . . . (p. 3)." In the same context, "qualitative research is an umbrella concept covering several forms of inquiry that helps us understand and explain the meaning of social phenomena with as little disruption of the natural setting as possible" (Merriam 1998, p. 5). Moreover, Merriam (1998) lists the vital characteristics of qualitative research as "the goal of obtaining understanding and meaning, the researcher as main instrument of data collection and analysis, the use of fieldwork, inductive direction to analysis, and findings that are richly explanatory" (p. 11).

Conversely, Bryman (1988) defines qualitative research as "an approach to the study of the social world which seeks to describe and analyze the culture and behaviour of humans and their groups from the point of view of those being studied" (p. 46).

In order to meet the aim of this study, which focused on a specific group (Middle Eastern universities), in a particular situation (dealing with e-learning), at a given time, this research strives to gain an understanding of the social world that the members inhabited. Bryman's definition of qualitative research describes the required approach.

The first phase of the study will be qualitative to explore dimensions of a maturity model for e-learning through in-depth interviews collected from participants at the first phase.

3.5.2 The Nature of Quantitative Research

Miles and Huberman (1994) and Punch (1998) suggest that in quantitative researches the stress is on data in the form of numbers, whilst in qualitative studies the stress is usually on data in the form of expressions. Also, Denzin and Lincoln (2000) go on to say that the scientific or positivist approach uses quantitative methods, highlighting the "measurement and analysis of causal relationships between variables, not processes" which means that positivists contend that the world is objective and that actuality can be captured and understood. In the same context, they state that quantitative research declares that, by strictly adhering to scientific philosophies, their research is undertaken within a value-free framework, which leads to balanced research findings.

Moreover, Bryman (2004) defines quantitative research stating that "quantitative research usually emphasizes quantification in the collection and analysis of data. As a research strategy it is detective and objectivist, and incorporates a natural science model of the research process." This is supported by Creswell (2009) who defines quantitative research as "a means for testing objective theories by examining the relationship among variables. These variables can be measured, typically on instruments, so that number data can be analyzed using statistical procedures. The final written report has a structure consisting of introduction, literature and theory, methods, results and discussion." Tesch (1990) states that quantitative research is usually based on deductive reasoning in which the researcher develops a hypothesis which is then tested. In the same context, Bryman (2004) identifies sequential steps that quantitative research usually follows theory, hypothesis, research design, devise measures of concepts, select research site, select research subjects, collect data, process data, analyze data, and identify findings (Bryman 2004, p. 63).

As the above phases demonstrate, quantitative research follows a set of procedures in a linear order, starting with a hypothesis. On the contrary, qualitative research is hypothesis generating, as opposed to hypothesis testing, and theories often come out from the data collection rather than prior to it (Robson 1993). In addition, the procedures followed in qualitative research are rarely divided into separate steps but are more incorporated and holistic in nature (Robson 1993). Finally, quantitative research is thus considered to be simpler than its qualitative counterpart (Punch 1998) and the most common method for collecting data through the quantitative paradigm is by the use of questionnaires.

In summary, from the initial exploration, the qualitative findings will be used to develop measures that can be administered to a large sample. In the tentatively quantitative phase, questionnaires will be collected from participants at the second phase.

Thus, questionnaires were used comprehensively during this research to collect quantitative data from the students and staff. Also, questionnaires can supply huge quantities of data inexpensively and this data can be analyzed statistically to allow for comparisons to be made across groups. The more highly controlled the questionnaire the easier this becomes, but the data composed does not have the richness or strength of a less-structured questionnaire (Cohen et al. 2000). For this research, questionnaires were used to gather data about students' attitudes, effects of e-learning on students, ways of executing an e-learning system, university attitude towards e-learning, e-learning features, and implementation of e-learning strategies. The questionnaire consisted of a series of open-ended questions, follow by closed questions. The main disadvantage of questionnaires is the limited response rate or the small number of successfully completed questionnaires (Wellington 1996; Cohen et al. 2000).

From the preceding debate, in the first phase of research the qualitative approach defines the dimensions of an e-learning maturity model. This was accomplished by asking students and

faculty members to explain their e-learning experience. In the second phase, the quantitative approach involved constructing and validating a questionnaire that could be used to measure maturity level of e-learning.

Finally to explore a maturity model for e-learning, this thesis uses several methods of data collection, or various sources of verification. In the first phase this study employed qualitative research, but the second phase employed quantitative methods. Thus, Qualitative methods are appropriate in the first phase, where this study needs to first identify the dimensions (factors) of a maturity model for e-learning that might later be tested quantitatively. For that reason, this study depends on multi-methodological approach.

In the next section this research will review the multi-methodological approach.

3.5.3. Mixing Qualitative and Quantitative Approaches to Research

Fundamentally, the model discussion was based on whether or not qualitative and quantitative data could be merged. Some disagreed that multi-methodological research was indefensible because mixed methods asked for paradigms to be merged (Smith 1983). Further, Rossman and Wilson (1985) called these individuals 'classicists', who cannot mix paradigms; others, they called 'situationalists', who adapt their methods to the situation, and 'pragmatists', who believe that multiple paradigms can be used to address research problems. Although, the problem of reconciling paradigms is still obvious, calls have been made to hold pragmatism as the best philosophical foundation for multi-methodological research (Tashakkori & Teddlie 2003a).

The argument about which paradigms present a foundation for multi-methodological research has not ended, attention during the 1980s began to move toward the methods or procedures for designing a multi-methodological study. There are several chronological and theoretical discussions of the last few decades about multi-methodological research. Campbell and Fiske (1959) supported the collection of numerous forms of quantitative data to study the confirmation of psychological traits. Others combined both quantitative and qualitative data in this period (Sieber 1973; Jick 1979), and the question became whether it was acceptable to mix both forms of data when they arose from different perspectives (Reichardt & Cook 1979). Similarly, Jick (1979) noted the following advantages of multi-methodological research: (a) it allows researchers to be more convinced of their results; (b) it encourages the development of creative ways of collecting data; (c) it can lead to thicker, richer data; (d) it can lead to the integration of theories; (e) it can expose contradictions; and (f) by high merit of its richness, it may serve as the litmus test for competing theories.

Also, during the 1970s and 1980s, qualitative researchers were firm in their views that different hypotheses provided the fundamentals for quantitative and qualitative research (Guba & Lincoln 1985; Smith 1983). Greene et al. (1989) presented a traditional paper that arranged the

foundation for multi-methodological research design. In their article, they examined fifty seven assessment researches, developed a categorization system of six types, and talked about the design decisions that go into each of the categories. In 1988, Bryman defied the argument and began suggesting that a clear relationship existed between the two traditions. Brewer and Hunter (1989) agree and supported this, by linking multi-method research to the steps in the process of research. Similarly, Morse (1991) developed a system to express how the quantitative and qualitative elements of a study are implemented.

By 1994, Reichardt and Rallis reported how this debate played out with speaking advocates on both sides at the American Evaluation Association annual meeting. Today, there are still qualitative researchers who avoid multi-methodological research because of the inappropriateness of "mixing" paradigms. In the same context, Morgan (1998) presented a decision matrix for determining the type of design to use. Moreover, Newman and Benz (1998) started to map the forms of combined methods approaches, paying attention to such subjects as validity and inferences (Tashakkori & Teddlie 1998). Also, The National Research Council (2002) talked about scientific research in education and concluded that three questions are needed to guide inquiries: "Description what is happening? Cause—is there a systematic effect? And the process or mechanism, why or how is it happening?" (p. 99). These questions, in combination, suggest both a quantitative and a qualitative approach to scientific inquiry.

The new millennium has seen an expansion in the awareness of multi-methodological research as well as authors advocating for multi-methodological research as a separate design in its own right (Tashakkori & Teddlie 2003a; Creswell 2003). Creswell (2003) aligned mixed methods as a third approach, beside the quantitative and qualitative approaches. In 2003, the National Science Foundation (NSF) held a workshop on the scientific foundations of qualitative research, with five papers dedicated to merging qualitative and quantitative methods (Ragin, Nagel & White 2004). Most recently, Johnson et al. (2004) advocated taking into consideration mixed methods as a genuine design in educational research. In the summer of 2004, the National Institutes of Health (NIH) held a workshop, entitled Design and Conduct of Qualitative and Mixed-Method Research in Social Work and Other Health Professions, sponsored by seven NIH Institutes and two research offices. Among the topics discussed was the use of mixed methods research in intersection research. Moreover, from1995 until 2005, Plano Clark (2005) confirmed that the number of mixed methods' studies reported in academic journal articles continued to increase.

Creswell, Fetters & Ivankova (2004) stated that mixed methods are being implemented in more disciplines and fields of study, e.g., the Annals of Family Medicine published a particular issue on mixed methods research. Also, the Journal of Counseling Psychology identified a particular issue on qualitative and mixed methods research (e.g., Hanson et al. 2005). In July, 2005, at Cambridge University and supported by the Homerton School of Health Studies, the first international seminar exclusively devoted to mixed methods research was held; it brought

together more than one hundred mixed methods investigators and methodologists. In 2005, Sage issued a new journal, the Journal of Mixed Methods Research, which is completely devoted to publishing studies and discussions about the methodology of mixed methods research. The first issue was published in January 2007 and its call for papers states that "the definition of mixed methods research is research in which the investigator collects, analyzes, mixes, and draws inferences from both quantitative and qualitative data in a single study or a program of inquiry" (Journal of Mixed Methods Research 2006).

Creswell and Plano (2011) stated that there are six types of Mixed Methods Designs: a) The Convergent Parallel Design, whose purpose is "to obtain different but complementary data on the same topic" (Morse 1991, p.122) to best understand the research problem; b) The Explanatory Sequential Design, whose overall purpose is to use a qualitative strand to explain initial quantitative results (Creswell, Plano Clark et al. 2003); c) The Embedded Design, the researchers use it when they need to include qualitative data to answer a secondary research question within the predominantly quantitative study; d) The Transformative Design, used when the researcher seeks to address issues of social justice and call for change; e)The Multiphase Design, selected to address a set of incremental research questions that all advance one programmatic research objective; and f) The Exploratory Sequential Design, useful when quantitative instrument are not available.

The choice of research plan must be suitable to the subject under examination (Robson 1993). Thus, the selection of a survey research strategy does not necessarily mean that qualitative methods of data collection are excluded. Methods of data collection are more appropriately determined by the research queries that the succeeding data is likely to notify and can, therefore make restricted use of either qualitative or quantitative evidence, or may include both (Yin 1994). The methodology employed to collect the data in the second phase in this thesis was quantitative. However, in order to provide more than one perspective on the phenomena being studied a qualitative methodology was employed using open-end questions.

In essence, this research is mixed methods in nature (Exploratory Sequential Design), not only using a qualitative nor quantitative approach alone. The purpose of this mixed methods study was to first explore and generate dimensions about a maturity model for e-learning at universities in developed countries using qualitative in-depth interviews. Then, based on these themes, the second phase was to survey students about dimensions of maturity the model, which will be an instrument used to assess the maturity and deployment level of e-learning. The rationale for using both qualitative and quantitative data was that it provides a useful step to create a maturity model for e-learning assessment, informed by the success of process maturity approaches in software engineering.

Creswell and Plano (2007) describes mixed methods research thus:

> "Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases in the research process. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone."

According to this definition, mixed methods is therefore concerned with methods of inquiry of how the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone. A mixed method approach facilitates this research's drive to propose a maturity model as the assessment mechanism of e-learning provision in developing countries and to investigate to roughly a university's response to e-learning by assigning time and energy, concentrating on multi aspects of e-Learning in higher education institutions.

Morgan (1998) recommended that this model is suitable to use when testing components of an emergent theory resulting from a qualitative phase and that it can also be used to generalize qualitative findings to different samples. Finally, the sequential exploratory strategy is often discussed as the procedure of choice when a researcher needs to develop an instrument because existing instruments are inadequate or not available (Creswell 1999).

This model is useful for this research, which wants to explore a maturity model for e-learning and also needs to expand on quantitative findings. In addition, this model is especially advantageous when a researcher builds new instruments (Creswell 1999). The main reasons of using mixed methods in this study were: (a) through the qualitative phase; words and narrative can be used to add meaning to numbers(phase two); (b) through the quantitative phase; numbers can be used to add precision to words (phase one); (c) qualitative and quantitative research used together produces more complete knowledge about a maturity model for e-learning; (d) the quantitative phase (phase two) can be used to increase the generalizability of the results; (e) using sequential methods (phase one and phase two) can add insights and understanding that might be missed when only a single phase is used; and (f) sequential steps through phase one and phase two can answer a broader and more complete range of research issues.

All research techniques have their advantages and disadvantages but using a multi-method approach can help rise above some of the disadvantages (Robson 1993). The margins between qualitative and quantitative study are more vague than references on the topic might lead us to consider. As Denscombe (1998) states, in actuality the two approaches "are not mutually exclusive" (p. 174) and may be used in combination, as no single method can address all issues

(Burns 2000). Excellent research tends to encompass components of both approaches (Denscombe 1998).

Moreover, Jones (1997) advises that research which aims to examine the cognitive, affective and behavioural components of a study can benefit from using a mixed methods approach, using quantitative methods to assess the behavioural components alongside qualitative methods to measure the cognitive and affective elements.

3.5.4. Reasons for Using the Exploratory Sequential Design

There are six specific reasons why this research has used a mixed methods approach. The first and perhaps most common reason is exploration. Thus, the primary purpose of the exploratory design is to generalize qualitative findings based on a few individuals from the first phase to a larger sample gathered during the second phase. As with this exploratory design, the intent of the two-phase exploratory design is that the results of the first, qualitative method (in-depth interview) can help develop or inform the second, quantitative method (survey) (Greene et al. 1989). This design is based on the premise that exploration is needed for several reasons: (1) measures or instruments for evaluating the e-learning process are not available; (2) the variables for the maturity model of e-learning are unknown; and (3) there is no guiding framework or theory for evaluating the e-learning process.

A second reason is triangulation. This strategy involves using more than one method to address the same research question. This research looks for convergence of research findings to enhance credibility. As an aside, it is important to note that while the research is uses the term triangulation in this context to mean using qualitative and quantitative methods (methods triangulation), this research has combined constant comparative and factor analysis for interpreting research findings (data analysis triangulation).

A third reason for employing a mixed methods design is that complementarity, whereby the research uses a qualitative methods to explore dimensions for the e-learning maturity model, while also using quantitative components, to construct questionnaires that could be used to measure the maturity level of e-learning.

A fourth reason to conduct a mixed methods study is that of development, whereby findings from an exploratory qualitative study are used to develop a survey questionnaire for the quantitative phase.

A fifth reason cited for using mixed methods is that of initiation, in the case of this research, it may turn out that there are exploratory concerning new model for e-learning.

Finally, the sixth reason for performing mixed methods research is expansion. This research has decided to expand the study to include models of e-learning with the intention of examining the effects of these models on students' attitudes.

3.5.5. Triangulation

This research is an example of a study using a triangulation approach where the two main research methods used are:

- A qualitative research method: in-depth interviews with students and staff members.
- A quantitative research method: questionnaires administered in six scales.

The overall tenor of the results of the sequential use of the two research strategies was mutually reinforcing. The qualitative findings defined the dimensions of the maturity model of e-learning. This was accomplished by asking students and staff members to describe their experiences. These dimensions were confirmed by the quantitative evidence, which also corroborated the suggestion from the qualitative evidence.

In the following section the research stages will be explained.

3.6. Phase One: Qualitative/Interpretive

This research includes two-phases: the aim of the two-phase Exploratory Sequential Design is that the results of the first phase (qualitative) can answer the research question defining the dimensions of e-learning maturity model. Phase two involves constructing and validating a questionnaire that could be used to measure the maturity level of e-learning. This design is based on the hypothesis that an exploration is required for one of numerous causes: measures or instruments are not on hand, the variables are unidentified; or there is no guiding construction or theory. Because this design begins qualitatively, it is well- suited for exploring a phenomenon (Creswell, Plano Clark et al. 2003). This design is mainly helpful if a researcher needs to develop and test an instrument when one is not obtainable (Creswell 1999; Creswell et al. 2004) or to recognize significant variables to study quantitatively when the variables are unidentified. It is also suitable when a researcher needs to generalize outcomes to different groups (Morse 1991), to study characteristics of an evolving theory or categorization (Morgan 1998), or to investigate an event in depth and then evaluate its occurrence.

The sequential exploratory strategy involves a first phase of qualitative data collection (in-depth interviews) and analysis, followed by a second phase of quantitative data collection (survey) and analysis that builds on the results of the first qualitative phase. Weight is generally placed on the first phase (qualitative phase), and the data are mixed through being connected between the qualitative data analysis and the quantitative data collection. At the most basic level, the purpose of this strategy is to use quantitative data and results to assist in the interpretation of qualitative findings. The primary focus of this model is to initially explore the dimensions of a maturity model for e-learning.

3.6.1 In-depth Interview

In the first phase, the research will depend on in-depth interviews as a suitable means of gathering qualitative data. This technique, although time-consuming, provides the chance to obtain qualitative data in a manner that has the benefit of providing an overall question framework and a focus for the interviewer, whilst also providing the opportunity for the student to express their views. Additionally, the interview is not restricted to questions that the interviewer initially intends to demonstrate: in other words, if issues occur during the interview process, and are considered relevant to the research issues, then these issues will be followed up. The uses of in-depth interviews are, therefore, appropriate to this research because they allow the opportunity for in-depth debate with a variety of relevant participants within a focused framework this research is interested in participants' perspectives on aspects of e-learning evaluation.

In the same context, in-depth interviews will ensure that the interview has a clear direction and idea but that there will also be opportunities for students and staff to express their views, explain individual perspectives and expand on answers. The in-depth interview meets the research aim of respecting how the students and staff frame and structure the maturity model for e-learning. "This, in fact, is an assumption fundamental to qualitative research - the participant's perspective on the social phenomena of interest should unfold as the participant views it, not as the researcher views it" (Marshall & Rossman 1989). As such, to provide an overall construction to the interview, and look for the collection of quantitative and qualitative data, a mixture of closed and open questions will be utilized (Moser & Kalton 1977; Grummitt 1980; Robson 1993).

Also, the use of in-depth interviews provide the opportunity to link different participants perspectives related to specific research objectives: Students' attitudes towards e-learning, Effects of e-learning on students, Exploring students' beliefs and attitudes toward e-learning amongst different faculties, How the e-learning will be implemented, University attitude towards e-learning, and Strategies of implementing e-learning.

Moreover, in-depth interviews are advantageous for gathering data on individuals' personal histories, perspectives, and experiences, particularly when sensitive topics are being investigated. It is an extremely useful method of data collection that supplies: a) freedom in terms of content and structure; b) details of what questions could be asked; and c) formulating question depending upon what occurs in the context of discussion.

3.6.2. Participants in Qualitative Phase

Qualitative data will be collected through in-depth interviews conducted with a purposeful sample (Patton 2002) of faculty and students. Participants will be selected to represent diverse e-learning systems based on features including the effects of e-learning on students, e-learning models, e-learning strategies and university attitude. The open-ended questions contained general

questions about students' attitudes and more specific questions about university attitudes from the students' prospective. Constant comparative analysis (Merriam 1998; Strauss & Corbin 1990) will be used to develop descriptive codes (Miles & Huberman 1994) from the transcribed interview data.

To ensure that the measure would be appropriate for assessing the maturity model of e-learning, regardless of educational level or higher educational institution, staff of several different types of institutions and students at various levels within institutions took part in this research. One hundred and fifty staff and students, representing a wide range of levels, participated in interviews.

3.6.3. Data Collection Instruments

The student interviews occurred at the end of the semester (See Appendix A). This timing was intentional, in order to gather data from students who had utilized a specific instructor's course website for an entire semester. It was expected that having a full semester of involvement would support detailed discussion of course website experiences based on fifteen weeks of usage and ample opportunity to become familiar with e-learning features. Importantly, interviews were conducted prior to students beginning another semester and their previous course website experiences becoming out of date. One hundred and fifty interviews were held as in-depth interviews (seventy five with students and seventy five with staff), and the involvement of students via in-depth interviews has provided valuable perspectives that supplement the information provided by staff.

The interview scheduling was handled via face to face interview. Based on Hammersley and Atkinson's (1995) suggestion to allow the interviewees a little time to discuss what is happening in their life, students were encouraged to share details about themselves (p. 226). This early discussion led into the formal interview, and supplied the chance for casual relationship building, serving to relax the participants and aid interview participation.

The student interview questions were designed to elicit information related to students' technological background, the course website experience, the course website content and the student/instructor interaction regarding the site. The questions were designed in such a way as to help the interviewees think about how e-learning could be evaluated (See Table 3.1 and 3.2).

Structure of Students' Interviews:

The first question dealt with the students' behaviour through using computers, the Internet, and prior usage of websites. After the behaviour question, questions #2 to #5 asked about the students' opinions regarding physical interaction with the site, providing details on particulars such as site access and site navigation. Question #6 explored student's feeling. The next set of questions (#7 to #11) involved interaction between the students and the instructor regarding the website, extracting information about student involvement in course website design and content.

Questions #12 and #13 explore if students in web-enabled learning environments become more active and self-directed learners. Question #14 explored if students feel that technology can facilitate communication with faculty and classmates. Questions #15 and #16 explored if there are positive effects on student learning, problem-solving skills and critical thinking skills. Questions #17 to #19 explored faculty members' behaviours from students' perspectives. Questions #20 to #23 explored effects of Constructivist learning environments, questions #24 and #25 explored effects of Behaviourism, and questions #26 to #28 explored effects of Cognitivism theory.

Each of these areas of inquiry provided student responses that in many ways support the constructivist categories and site taxonomy discussed in the literature review chapter and used for initial course website evaluation and thematic coding. Specifics are discussed within the analysis chapters.

Interviews progressed in a question-by-question manner, with opportunities for respondents to add information they felt was important. Table 3.1 and 3.2 give selected elements developed to measure each element. The final survey instrument incorporated technical suggestions offered by respondents to the pilot instrument and an expert on survey design. In-depth interview questions for students are presented in table 3.1.

Domain	Potential Elements	Explanation	Interview Questions
Students' Attitudes	Behaviour	Behaviours possessed by individuals.	1. Describe what sort of features do you use in e-learning? And why?
	Cognitive	Opinion towards the Internet and online learning.	2. Describe your opinion about e-learning? Is it easy to access BlackBoard? Have you had problems getting to the site? What type of problems? 3. Does site usage require any special technical skills? 4. What do you like and dislike? Why? 5. Do you have a preference for information delivery, one over the other? Is one better than the other?
	Feeling	Feeling towards online learning.	6. Does using the course website make you more motivated regarding class?
Effects of e-learning on students	Explore e-learning Features	Examined the e-learning perceptions and preferences of students.	7. What type of content is provided by the site? Instructor info? Course info? Course documents? Schedules? Assignments? Resources? (Discuss each item) 8. What is the most important content provided? (Can't live without.) Why? 9. What is the least important content provided? (Never used…doesn't matter if it's there.) And why? 10. Does the site utilize any audio or video technology? Do you watch the videos or listen to the recordings? 11. What content is missing? What should be there that currently is not?
	Education gains	Explore if students in web-enabled learning environments become more active and self-directed	12. Does the provided content contribute to your learning? Why? Why not? 13. Would you say that your

		learners.	learning experience is enhanced by the course website? If so, why? If not, why?
	Communications gains	Explore if students feel that technology can facilitate communication with faculty and classmates.	14. Would you say that you feel more connected to the class by having access to the course website?
	Organization gains	Explore it there are positive effect on student learning, problem-solving skills, and critical thinking skills.	15. Would you say that the online submission of assignments was simple? If so, why? If not, why? 16. Would you say that the calendar section be a valuable resource. ? If so, why? If not, why?
University attitudes from students' prospective	Behaviour	Explore faculty members' behaviours from students' perspectives.	17. Did you attend other courses where instructors had course websites? What was experience with these sites? 18. Does your instructor use a course management system? If so, what information is provided via this focus? 19. How does this differ from the information that is provided in the faculty website?
e-learning implementation	Constructivism	Constructivist learning environments provide numerous demonstrations of reality. The learner should be subjected to different views.	20. Do you ever learn from different resources through the web site? 21. Does the website ever guide learners and instructors in conducting, managing and encouraging personalized learning activities through collaborative learning? 22. Do you ever give feedback on site design, information provided, organization, navigation, etc? What do the instructors say? 23. Does the usage of this technology enable interactions that were not possible without course websites?
	Behaviourism	Behaviourists suggested a	24. Do you have self-assessment

		structured, deductive approach to propose an online course, so that essential theories, skills, and realistic information can rapidly be acquired by the students.	questions as interactive activities in the learning materials? 25. Do you have Step-by-step description of learning materials in small chunks?
	Cognitivism	Cognitive psychology spotlights on learners' getting and handing out of information to transmit it into long-term memory for storage. Consequently, instructional designers have to consider different features beginning from cutting up the learning content into smaller elements and encouraging different learning styles up to higher concepts such as motivation, collaboration or meta-cognition.	26. Does the educator set the objectives of the learning process? 27. Do you found Instructions for learning to learn? 28. Do you found the annotation and notes in course website?

Table 3.1 Definition of Elements and Development of Survey Items from students' perspectives (Students' Interview Protocol)

Structure of Faculty members' Interviews

Other in-depth interviews were developed to explore the dimensions of a maturity model for e-learning. This time, the interview questions were expected to explore behaviour, opinion, feeling and e-learning strategies from staff perspectives.

Questions #1 to #8 explored faculty members' behavioural intentions to use e-learning. After the behaviour questions, questions #9 to #19 explored faculty members' opinions about e-learning. Questions #20 and #21 examined faculty members' feelings concerning e-learning, and question #22 involved with effects of e-learning. Question #23 explored the development provided for teaching staff. Questions #24 and #32 explored the support provided for teaching staff. Questions #33 and #34 explored faculty members' perceptions of e-learning, while questions #35 to #41 explored the institutional planning and management for e-learning. In-depth interview questions for staff are presented in table 3.2.

Domain	Potential Elements	Explanation	Interview questions
University attitudes	Behaviour	Explore Faculty members' behavioural intentions to use e-learning.	1.Describe what type of content do you provide on your site? Instructor info? Course info? Course documents? Schedules? Assignments? Resources? (Discuss each item)Why are these items supplied and not others? 2.Do you provide resource links or supplemental information to support classroom lectures? 3.Do you provide any interactive content on your site? What form does the interaction take? 4.How did you develop this content? What kind of feedback do you receive from the students regarding this type of content? 5.Do you ever ask the student for feedback/input on site specifics? 6.Do the students ever give feedback on site design, information provided, organization, navigation, etc? What do they say? 7.Does your site utilize any audio or video technology? Do the students watch the videos or listen to the recordings? 8.What kind of feedback do you receive from the students regarding this type of content?
	Opinion	Explore faculty members' opinions about e-learning.	9. What is the most important content provided? (Student can't live without.) Why? 10. What is the least important content provided? (Likely never used…doesn't matter if it's there.) Why? 11. Do you think the provided content contribute to your students learning? Why? Why not? 12. Do the students use this

			information? How can you tell? What content is missing? What should be there that currently is not? 13. Would you say that your site enhances your students learning experience? If so, why? If not, why? 14. Would you say that your site helps your students feel more connected to the class? 15. Do you ever talk to the students about the course website? Why? 16. How does this differ from the information that is provided on your faculty website? 17. How is this similar to what is being provided on your faculty website? Overlap? 18. Do you have a preference for information delivery, one over the other? Is one better than the other? Why? 19. What approaches did you adopt to allow student to focus on online learning and to maximize e-learning resources reuse?
	Feeling	Examine faculty members' feelings concerning e-learning.	20. Does any of the provided content serve e-learning theories? Which ones? How do they help the learner construct knowledge? 21. Do you think using the course website make your students more motivated regarding class?
Strategies of implementing e-learning	Learning	Explore the highest value learning outcomes from e-learning.	22. What are the most important effects from e-learning on the learning process?
	Development	Exploring the development provided to teaching staff.	23. Are teaching staff provided with design and development support when engaging in e-learning?

	Support	Exploring the support provided to teaching staff.	24. Which other departments in the college did you work with when developing course website(s)? 25. In your opinion, is there any difference in technical assistance and library facilities between e-learning and traditional learning? If yes, what are the differences? 26. Are teaching staff provided with e-learning pedagogical support, professional development and technical support when engaging in e-learning? If so, how? 27. What approaches did university adopt to allow regular reviews of the e-learning aspects of courses are conducted? 28. Are teaching staff and students able to provide regular feedback on quality and effectiveness of their e-learning experience? 29. What strategies did university use to monitor, manage or regulate online learning? 30. For example, did university make plans for online learning? 31. Are students provided with information on e-learning pedagogies, information on e-learning technologies and administration information prior to starting courses? 32. What are standard criteria which guide the allocation process of resources for e-learning design, development and delivery?
	Evaluation	Exploring faculty members' perceptions of	33. Are there reviews of the e-learning aspects of courses are conducted?

		e-learning.	34. Are teaching staff able to provide regular feedback on quality and effectiveness of their e-learning experience? If so, how? If not, why?
	Organization	Exploring the institutional planning and management for e-learning.	35. In your opinion, is there an explicit plan links e-learning technology, pedagogy and content used in courses? If yes, what is the plan? Moreover, what roles do students play in it? 36. Did you experience any problems that interfered with or slowed down course website development? 37. Do you have any recommendations for how the course website development process can be improved in the future? 38. Are students provided with e-mechanisms and e-learning skill development for interaction with teaching staff and other students? If so, how? 39. Do you think students receive feedback on their performance within courses website? If so, how? 40. Are students provided with support in developing research and information literacy skills through the website? If so, how? 41. Do you know how e-courses and e-assessments are designed to support diverse learning styles and learner capabilities?

Table 3.2 Definition of Elements and Development of Survey Items from faculty perspectives (Faculty Members' Interview Protocol)

3.6.4. Data Analysis for Qualitative Phase

The analysis for phase one served to answer the first research question concerning the dimensions of maturity model for e-learning. Using Glaser and Strauss's (1967) technique of constant comparison, and also Miles and Huberman's (1994) ideas for coding qualitative data,

the analysis in this step identified and classified all process that the participants explained or referred to in the interviews, pertaining to their attempts to explore about and fit into e-learning. This process was accomplished in several iterations.

First, the transcriptions were read to attain an overall idea of the interviewees' responses. Next to each line or paragraph, labels were produced to return initial coding. From these labels, a general category scheme was developed from the participant response.

Second, themes were recognized by arranging the initial scheme into main categories and subcategories. The categorization will reflect similarity of responses (in consideration with the maturity model for e-learning). Next, the transcripts were reread, in particular looking for repeatedly occurring terms and unpredicted material that supplied unusual evidence of participant experience. The responses were categorized according to several initial themes, such as students' attitudes, university attitudes, effects of e-learning, e-learning models and e-learning strategies, as well as understanding how these dimensions fit into e-learning maturity model.

Third, these themes were reviewed to determine how they might contribute to an understanding of the e-learning maturity model. During this step, two questions were addressed: does the narrative data confirm current dimensions, and does it offer new dimensions? As a result, the initial themes will be combined and renamed into dimensions of the e-learning maturity model.

Finally, the responses will be reread and categorized into dimensions of the e-learning maturity model to ensure goodness of fit.

3.7. Phase two: Quantitative

This section presents the documentation for questionnaires that are conducted as part of the methodology followed to design solutions for creating a uniform evaluation strategy for e-learning. The following sections will: (a) explain the objectives, (b) discuss the structures, (c) describe the method used to produce the questions, (d) discuss and explain key research concepts, (e) present the questions of the questionnaires, (f) analyze the parts and the contents of the questionnaires, and finally (g) place the questionnaires within the framework of the undertaken research.

3.7.1. Objectives of these Questionnaires

It must be declared that the ideal subjects for this step should be students and faculty staff that have been (or are) involved in e-learning. The main focuses are concentrated on dimensions of a maturity model for e-learning, especially how the model is formed and how these dimensions will be measured.

Therefore, at this point it would be most useful to assemble a list of the main objectives of these questionnaires. These objectives are:

1. Obtain a better understanding of e-learning problems, due to direct contact with experienced students.
2. Investigate how e-learning application is formed. Record what criteria are used and which priorities exist for each dimension.
3. Investigate university attitude towards e-learning.
4. Understand strategies of implementing e-learning.
5. Investigate possible obstacles.
6. Investigate university preparations in e-learning. The main aim is to understand how universities act in situations that are relevant to new e-learning environment (e.g. training staff, infrastructure, and e-learning strategies).
7. Explain which of the problems that students face in e-learning are due to or related to attitudes.
8. Examine the awareness of universities.
9. Explore how strategies of implementing e-learning affect the overall educational process.
10. Identify how requirements for e-learning differ when e-learning is implemented in different faculties.
11. Explore universities problems in cases of using e-learning for the sake of using e-learning.
12. Investigate any existing ideas or techniques that universities use in order to form a framework, which is often presented as a list of desirable steps that give a systematic structure for achieving successful e-learning implementation and assigning responsibilities between departments.
13. Learn more about an existing e-learning system and record any preparations that universities made to facilitate the function of e-learning.
14. Identify the needs that students have for implementing e-learning.
15. Investigate if there are specific needs concerning different faculties.
16. Give emphasis to students' attitudes towards e-learning and effects of e-learning on students. These should be part of the overall process that requires further investigation and examination, either to improve students' performance or to understand the educational outcomes.
17. Suggest ways that would facilitate the procedure of creating a uniform evaluating strategy for e-learning.
18. Also to promote key ideas that would convince any unanswered questions regarding a maturity model for e-learning, such as how the e-learning will be implemented.
19. Exploring the pattern of use of typical e-learning features by students in a campus- based university.

The questionnaires have been linked with research objects as illustrated in table 3.3.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Questionnaire 1							✓							✓		✓			
Questionnaire 2							✓		✓	✓					✓	✓			
Questionnaire 3	✓			✓										✓				✓	
Questionnaire 4			✓					✓	✓				✓						
Questionnaire 5		✓			✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓		
Questionnaire 6																			✓

Table 3.3 Linking questionnaires with research objectives

3.7.2. Questionnaires Structures

The questionnaires explained in this thesis have two sections. The first section was used to collect demographic data about age, gender, major and educational year. The second section of the questionnaires is the questions themselves, which are organized into several categories according to their purpose, links with research, and issues concerned.

As shown in this research report, there are six questionnaires that are briefly discussed in this section. The first questionnaire is “Students’ attitudes towards e-learning” which contains questions that measure the student’s attitudes. Next is the “Effects of e-learning on students” questionnaire which gathers information to measure outcomes of e-learning from students’ perceptions. Then “How the e-learning will be implemented?” which collects the needs for student learning environments and support the progress of generic e-learning systems through the practices from students’ perceptions. Next “University attitude towards e-learning” measures university attitudes towards e-learning from faculty staff perceptions. Next “e-learning strategies” which has been used to evaluate e-learning strategies also from faculty staff perceptions. Finally “e-learning features” measures the usage of e-learning tools from students perceptions.

3.7.3. Questionnaires Process

This section examines the methods that are used to generate, manage and assess these questionnaires. There are numerous distinct phases describing the process followed from realizing the need for a questionnaire and identifying the main purposes to assessing the results of the various sessions. These phases are:

- Identifying the questions of the questionnaire: i.e. to decide which questions to include as part of this questionnaire. The decisions were based upon phase one and the literature review which is included in "Dimensions of a maturity model for e-learning".
- Selecting the questionnaires subjects: i.e. first to decide upon which dimension will be measured and second to consider the students' expectations of e-learning and whether these had been met.
- Carrying out an analysis: i.e. performing a statistical analysis of the questionnaires answers, and discussing the outcomes of this analysis.
- Investigating the links with dimensions of the maturity model for e-learning: i.e. using the results of the analysis executed to draw future research paths and to decide appropriate plans.

3.7.4. Design Survey Instrumentation

The instrument will be designed using the categories identified in the qualitative data. For example, students' attitudes towards e-learning, effects of e-learning on students, instructional model for e-learning, university attitude towards e-learning, e-learning features and e-learning strategies were the six factors selected to measure the change in level of capability of e-learning processes. A pool of survey items will be developed for each category, based on the interview data and informed by the literature (Fowler 1993). The pilot surveys, consisting of Likert scale questions and open-ended questions in a web-based format were completed by students and staff. All items on the pilot survey were tested for alpha reliability, and low-performing items (correlation < .5) were revised, replaced, or eliminated. Development of the final survey items drew on the findings from the qualitative analysis of the interviews, the results of the pilot survey, and a review of relevant literature.

For this study, there were six factors: *Students' attitudes towards e-learning* are described as *"*a hypothetical construct that represents an individual's degree of like or dislike for e-learning*"*. *Effects of e-learning on students* are: (a) make the communication between students and teachers quicker and easier, (b) education resources can be accessible all the time, (c) to make learning more attractive and reachable for more people, (d) to enable access to a wider range of information, from anywhere, and (e) it can be very interesting for already distance learning universities. *How the e-learning will be implemented* is the direction provided within the e-learning, including Constructivism, Behaviourism, and/or Cognitivism. *University attitude towards e-learning* can be explained as obstacles to faculty contribution in e-learning. *Strategies of implementing e-learning are* a set of goals or objectives that need to be achieved with e-

learning. *E-learning features are described* as *"*a hypothetical construct that represents an individual's degree of use or non-use for e-learning tools*"*.

These questionnaires use a formalized set of questions for gaining knowledge from students and faculty staff. The overriding objective is to interpret the research information needs into a set of particular questions that respondents are willing and capable to answer. While this may seem uncomplicated, questions may yield very unusual and unexpected responses.

A continual analysis of the research project, particularly the specific components for creating uniform evaluating strategy for e-learning at Middle Eastern universities and the research question - What are the criteria affecting the introduction of maturity model in the deployment of e-learning in Middle Eastern countries? - will help keep these questionnaires focused.

In the same context, these questionnaires are the main means of collecting quantitative data and allow quantitative data to be collected in a uniformed way so, that the data are internally reliable and consistent for analysis. On the other hand, there are three types of attitudinal scale: a) the summated rating scale, also known as the Likert scale; b) the equal-appearing interval scale or differential scale, also known as the Thurstone scale; c) the cumulative scale, also known as the Guttman scale. A Likert scale is based upon the assumption that each statement on the scale has the same attitudinal weight. This assumption is the main limitation. Unlike a Likert scale, a Thurstone scale calculate a weight for each statement, whilst on the other hand, the scale is difficult to construct. A Guttman scale is one of the most difficult scales to construct and, therefore, is rarely used.

Depending on preceding debates, a Likert scale was selected for its straightforwardness, wide use in attitude measurement, and higher reliability coefficients with fewer items (Edwards & Kenney 1946).Thus, these questionnaires are given to the respondents by asking them to give their level of agreement on each statement using a five- point Likert scale, with higher values indicating greater levels of agreement with the statements. The scale is designated as follows: 5 for strongly agree, 4 for agree, 3 for uncertain, 2 for disagree, and 1 for strongly disagree.

Also, the questionnaires include open-ended questions that students answer in their own words. Open-ended questions are good as starter questions on a topic. They enable the students to state general attitudes and opinions that can help the research interpret their answers to prearranged questions. Moreover, unstructured questions let the respondents to state their attitudes or behaviours without the bias associated with controlling responses to predefined choices. Thus, they can be useful in identifying underlying, motivations, beliefs, and attitudes. Analysis of the verbatim observations supplies a rich context for understanding later questions. In the same context, unstructured questions are useful in this exploratory sequential research to explore the criteria affecting the introduction of a uniform benchmarking system in the deployment of e-learning in Middle Eastern countries (Bartels 2002; Bickart 1993; Malhotra 2004; Martin & Polivka1995; Diamantopoulos et al. 1994; Peterson 2006).

The data are typically treated as an interval scale. When using this approach to find out the total score for each respondent, it is important to use a constant scoring method so that a high (or low) score consistently reflects a favourable response. This requires that the classes assigned to the negative statements by the respondents are scored by reversing the scale. Most respondents cannot handle more than a few categories, and for that reason the appropriate number of categories is five. The decision to use an odd number of categories depended on whether some of the respondents may be neutral on the response being measured. Thus, with an odd number of categories, the middle scale position is generally designated as neutral or impartial.

3.7.5. Questions

The instruments used in this phase of study were online surveys instrument. The surveys instruments were developed to meet the goals of this particular study.

The online surveys instruments consisted of six scales. These scales consisted of 117 ranking questions. The beginning section of each scale uses 6 questions to collect data about participants' demographic characteristics, while there are open-ended questions that investigate the faculty members' and students' opinion about dimensions of the maturity model for e-learning.

The six scales are:

1. Students' attitudes towards e-learning.
2. Effects of e-learning on students.
3. Instructional model for e-learning.
4. University attitude towards e-learning.
5. Strategies of implementing e-learning.
6. E-learning features.

Scale 1: Students' attitudes towards e-learning

This scale had 18 items that represented statements concerning the students' attitudes towards e-learning. The participants were asked to specify their level of agreement or disagreement on a five-point scale, ranging from '5' (strongly agree) to '1' (strongly disagree), with '3' undecided. The range of possible mean scores was between 1 and 5, with higher scores indicating more positive attitudes (Table 3.4 and Appendix D).

The set of questions in the first instrument has been classified as the following: 1- Behaviour (represented by items SBeh1 to SBeh5). 2- Feeling (represented by items SFee1 to SFee5). 3- Opinion (represented by items SOpi1 to SOpi8).

The first scale that measures the students' attitudes toward e-learning was mainly developed from phase one and various questionnaires which have been used in the studies conducted by (Jones 2007; Francis 1993; Paris 2004; Seyal 2002) to examine the attitudes of students towards e-learning.

Scale 2: Effects of e-learning on students

This scale had 26 items that represented statements concerning the students' perceptions of the e-learning effects. This scale investigated students' access to e-learning features. The scaling and the rating of the overall scale was the same as that of the Attitudes Scale, with higher scores indicating students high level of access to basic e-learning features (Table 3.5 and Appendix F).

The set of questions in the second instrument have been classified as the following: 1- Communications (represented by items ECom1 to ECom10). 2- Education (represented by items EEdu1 to EEdu10). 3- Organization (represented by items EOrg1 to EOrg6).

The second scale that measures effects of e-learning on students was mainly developed from phase one and a mixture of questionnaires which have been used in the studies conducted by (Elango et al. 2008; Chou & Liu 2005; Buzzetto-More 2008) to examine the effects of e-learning.

Scale 3: Instructional model for e-learning

This scale had 15 items that represented statements concerning the implementation of e-learning. The investigated theories in this scale were related to Behaviourism, Cognitivism, and Constructivism. The scaling and the rating of the overall scale was the same as that of the Attitudes Scale, with higher scores indicating higher levels of feeling with effects from these theories (Table 3.6 and Appendix B).

The set of questions in the third instrument have been classified as the following: 1- Behaviourism (represented by items MBeh1 to MBeh3). 2- Cognitivism (represented by items MCog1 to MCog3). 3- Constructivism (represented by items MCon1 to MCon9).

The third scale that measures how e-learning will be implemented was mainly developed from phase one and other diverse researches (Mishra & Jain 2002; Partridge & Edwards 2005; lefoe 1998; Modritscher 2006; Nam & Smith-Jackson 2007; Hodges 2004; Ghaleb et al. 2006; Alderman & Milne 1999) to measure the structural and semantic effects of e-learning on knowledge construction.

Scale 4: University attitude towards e-learning

The university attitude towards e-learning scale had 15 items that represented statements concerning the faculty members' attitudes towards e-learning. The faculty members' perceptions of e-learning were examined in terms of Behaviours, Feelings, and Opinions. The scaling and the rating of the overall scale was the same as that of the Attitudes Scale, with higher scores indicating positive attitudes (Table 3.7 and Appendix E).

The set of questions in the fourth instrument have been classified as the following: 1- Behaviour (represented by items UBeh1 to UBeh3). 2- Feeling (represented by items UFee1 to UFee3). 3- Opinion (represented by items UOpi1 to UOpi 9).

The fourth scale that measures university attitude towards e-learning was mainly developed from phase one and a variety of questionnaires which have been used in the studies conducted by Mishra & Panda 2007, Sharma 2006, Lertlum & Papasratorn 2005, and Elango et al. 2008) to examine the attitudes of faculty members towards e-learning.

Scale 5: Strategies of implementing e-learning

The strategies of implementing e-learning scale had 34 items that represented statements about university readiness for e-learning. The e-learning strategies were examined in terms learning, development, support, evaluation, and organization.

The set of questions in the fifth instrument have been classified as the following: 1- Learning (represented by items SL1 to SL10). 2- Development (represented by items SD1 to SD6). 3- Support (represented by items SS1 to SS6). 4- Evaluation (represented by items SE1 to SE3). 5- Organization (is represented by items SO1 to SO9).

The fifth scale that measures e-learning strategies was mainly developed from phase one and studies conducted by Marshall & Mitchell 2007 to examine the e-learning maturity model.

The scaling and the rating of the overall scale was the same as that of the Attitudes Scale, with higher scores indicating more positive perceptions of the readiness (Table 3.8 and Appendix C).

Scale 6: E-learning Features

The e-learning features scale had nine items that represented e-learning features. The sixth scale that measures e-learning features was mainly developed from phase one and studies conducted by Ituma (2011) to examine e-learning tools.

The scaling and the rating of the overall scale was the same as that of the Attitudes Scale, with higher scores indicating more positive perceptions of the readiness (Table 3.9 and Appendix G).

Faculty Members' and students' Demographic Characteristics

The first section of each scale had six questions, which aimed to collect data about demographic characteristics of the participants in this study, including sex, age, major/program, owning pc, and internet. On the other hand, scale 1, 2, and 4 includes open-ended questions that investigate the faculty members' and students' opinion about the dimensions for the maturity model of e-learning.

Table 3.4 represents the questionnaire for students' attitudes towards e-learning.

Q1)	Indicate your gender ☐Male ☐Female	Demographic data
Q2)	Indicate your age	
Q3)	Indicate your major/program	
Q4)	Do you have computer at home?☐Yes☐NO	
Q5)	Do you have access to the Internet at home? ☐Yes☐NO	
Q6)	Do you have your own email account? ☐Yes☐NO	
	Open-end questions	
Q1)	What do you understand as e-learning?	
Q2)	How was your interaction with your classmates enhanced by e-learning?	
Q3)	Would you prefer to attend courses with e-learning support in the future?	
Q4)	Which e-learning features did you use?	
Q5)	What were the implications from e-learning in your performance?	
Q6)	What were the implications from e-learning to your major/program?	
	1- Behaviour	
SBeh1-	If given a choice I would first search for a website to find information for an assignment before I search for a book.	Behaviour
SBeh2-	I am using websites whenever I can.	
SBeh3-	I have no problems to find my way around a website.	
SBeh4-	Using websites has increased my interaction with other students.	
SBeh5-	I am using all features in e-learning.	
	2- Feeling	
SFee1-	If I had a choice I would prefer to learn from a website than from a book.	Feelings (Affective)
SFee2-	I feel with power when asked to use websites for assignment.	
SFee3-	I feel online exam is a good tool.	
SFee4-	Learning through websites encourages me.	
SFee5-	My university has got the technology needed for the delivery of e-learning	
	3- Opinion	
SOpi1-	The web- based assignment was easier to read than the paper based assignment	Opinions (Cognitive)
SOpi2-	The web quiz was easier to understand than the paper quiz activity.	
SOpi3-	Students learn more using web- assisted activities than paper assisted activities	
SOpi4-	Finding your way around a website is easier than finding your way around a book.	
SOpi5-	I find it easy to learn online.	
SOpi6-	Many of instructors encourage me to use e-learning methods.	
SOpi7-	E-learning is efficient as teaching method.	
SOpi8-	I got support and technical information about how to use communication and discussion board tools.	

Table 3.4 Students' attitudes towards e-learning scale (First Questionnaire)

Table 3.5 represents questionnaire for e-learning effects.

Q1) Indicate your gender ☐Male ☐Female	Demographic data
Q2) Indicate your age	
Q3) Indicate your major/program	
Q4) Do you have computer at home?☐Yes☐NO	
Q5) Do you have access to the Internet at home? ☐Yes☐NO	
Q6) Do you have your own email account? ☐Yes☐NO	
Open end questions	
Q1) In your opinion what are the implications of e-learning for students? Q2) what are the most significant implications of e-learning on your major?	
1-Communications	
ECom1- E-learning provided a reliable means of communication.	Communications gains
ECom2- E-learning portion allowed for social interaction.	
ECom3- The discussion section is a great way to interact with my fellow classmates.	
ECom4- The discussion section is a great way to interact with the instructor.	
ECom5- The discussion section helped me to ask and answer questions.	
ECom6- I emailed the instructor through the course website.	
ECom7- I regularly used the discussion section.	
ECom8- The course website helped to create a sense of community.	
ECom9- The course website increased my interactions with the instructor.	
ECom10- Course websites extend personal interactions.	
2-Education	
EEdu1- I found the links contained on the course website valuable.	Educational gains
EEdu2- I used the course website to help me understand course information.	
EEdu3- I found the course website to be a helpful resource.	
EEdu4- I regularly used the course website to answer my questions.	
EEdu5- I believe that course websites enhance learning.	
EEdu6- I believe that course websites will play an important role in college education in the future.	
EEdu7- The online lecture notes were a valuable resource.	
EEdu8- I read the instructor comments on my assignments.	
EEdu9- I found taking exams online convenient.	
EEdu10- The course website is a great place for the instructor to place handouts.	
3-Organization	
EOrg1- I enjoyed submitting my assignments online.	Organizational gains
EOrg2- I found the calendar section to be a valuable resource.	
EOrg3- I keep track of my grades on assignments and tests online.	
EOrg4- I found the online submission of assignments convenient.	
EOrg5- I checked the assignment section for my grades.	
EOrg6- I liked that I had the ability to check my assignment grades online.	

Table 3.5 Effects of e-learning on students scale (Second Questionnaire)

Table 3.6 represents questionnaire for e-learning models.

Q1)	Indicate your gender ☐Male ☐Female	Demographic data
Q2)	Indicate your age	
Q3)	Indicate your major/program	
Q4)	Do you have computer at home?☐Yes☐NO	
Q5)	Do you have access to the Internet at home? ☐Yes☐NO	
Q6)	Do you have your own email account? ☐Yes☐NO	
1-Behaviourism		
MBeh1	All materials have explicit objectives with respect to the student behaviour when accessing web pages.	Behaviourism
MBeh2	I can use self-assessment questions as interactive activities in the learning materials	
MBeh3	I found the step-by-step description of learning materials in small chunks useful.	
2- Cognitivism		
MCog1	It is straight forward for me to find the annotation and notes in the course web site.	Cognitivism
MCog2	It is straight forward for me to find instructions for how to learn.	
MCog3	It is straight forward for me to find information by using a search engine.	
3-Constructivism		
MCon1	I usually use the discussion forums and chat (both synchronous and asynchronous techniques) with my instructors and colleagues.	Constructivism
MCon2	Usually the instructor responses quickly to students' e-mails	
MCon3	I usually connect with my colleagues through email	
MCon4	The web site helps me to accomplish the group projects	
MCon5	The web site supports me by Streaming media.	
MCon6	The social activities on the net increase my course interaction.	
MCon7	I found different learning views provided via website	
MCon8	The website support self-learning concept	
MCon9	Most of electronic materials depend on critical and creative thinking	

Table 3.6 How the e-learning will be implemented? (Third Questionnaire)

Table 3.7 represents questionnaire for university attitude towards e-learning.

Q1) Indicate your gender ☐Male ☐Female	Demographic data
Q2) Indicate your age	
Q3) Indicate your major/program	
Q4) Do you have computer at home?☐Yes☐NO	
Q5) Do you have access to the Internet at home? ☐Yes☐NO	
Q6) Do you have your own email account? ☐Yes☐NO	
Open end questions	
Q1) What do you understand as e-learning? Q2) How was your interaction with your students enhanced by e-learning? Q3) Would you prefer to deliver/teach courses with e-learning support in the future? Q4) Which e-learning features did you use? Q5) What were the implications from e-learning in the performance of your students? Q6) What were the implications from e-learning to the student experience of their major/programme?	
1-Behaviour	
UBeh1 I am Using E-learning in collaborative learning.	Behaviour
UBeh2 I am using e-exams whenever I can.	
UBeh3 I use all features in Blackboard	
2-Feelings	
UFee1 e-learning helps students to communicate with instructors.	Feelings
UFee2 Blackboard is easy to handle.	
UFee3 e-calendar helps me to coordinate with my students.	
3-Opinion	Opinion
UOpi1 e-learning saves time and effort for both teachers and students.	
UOpi2 e-learning increases access to education and training.	
UOpi3 e-learning will increase my efficiency in teaching.	
UOpi4 e-learning enables collaborative learning.	
UOpi5 e-learning can engage learners more than other forms of learning.	
UOpi6 e-learning increases the quality of teaching and learning because it integrates all forms of media; print, audio, video, and animation.	
UOpi7 e-learning increases the flexibility of teaching and learning.	
UOpi8 e-learning improves communication between students and teachers.	
UOpi9 e-learning enhances the pedagogic value of a course.	

Table 3.7 University attitude towards e-learning scale (Forth Questionnaire)

Table 3.8 represents questionnaire for e-learning strategies.

Q1)	Indicate your gender ☐Male ☐Female	Demographic data
Q2)	Indicate your age	
Q3)	Indicate your major/program	
Q4)	Do you have computer at home?☐Yes☐NO	
Q5)	Do you have access to the Internet at home? ☐Yes☐NO	
Q6)	Do you have your own email account? ☐Yes☐NO	
1-Learning		
SL1	Learning objectives guide the design and implementation of courses website.	learning
SL2	Students are provided with e-learning mechanisms for interaction with teaching staff and other students.	
SL3	Students are provided with e-learning skill development	
SL4	Students are provided with expected staff response times to student communications.	
SL5	Students receive feedback on their performance within courses website.	
SL6	Students are provided with support in developing research and information literacy skills through the website.	
SL7	E-learning designs and activities actively engage students.	
SL8	e-Assessment is designed to progressively build student competence	
SL9	Student work is subject to specified e-calendars.	
SL10	e-courses are designed to support diverse learning styles and learner capabilities.	
2-Development		
SD1	Teaching staff are provided with design and development support when engaging in e-learning.	Development
SD2	Course development, design and delivery are guided by e-learning procedures and standards.	
SD3	An explicit plan links e-learning technology, pedagogy and content used in courses.	
SD4	Courses are designed to support disabled students.	
SD5	All elements of the physical e-learning infrastructure are reliable, robust and sufficient.	
SD6	All elements of the physical e-learning infrastructure are integrated using defined standards.	
3-Support		
SS1	Students are provided with technical assistance when engaging in e-learning.	Support
SS2	Students are provided with library facilities when engaging in e-	

	learning.	
SS3	Student enquiries, questions and complaints are collected and managed formally through web helpdesk.	
SS4	Students are provided with personal and learning support services when engaging in e-learning.	
SS5	Teaching staff are provided with e-learning pedagogical support and professional development.	
SS6	Teaching staff are provided with technical support in using digital information created by students.	
	4-Evaluation	
SE1	Students are able to provide regular feedback on the quality and effectiveness of their e-learning experience.	Evaluation
SE2	Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience.	
SE3	Regular reviews of the e-learning aspects of courses are conducted.	
	5-Organization	
SO1	Formal criteria guide the allocation of resources for e-learning design, development and delivery.	Organization
SO2	Institutional learning and teaching policy and strategy explicitly address e-learning.	
SO3	e-learning technology decisions are guided by an explicit plan	
SO4	Digital information use is guided by an institutional information integrity plan.	
SO5	e-learning initiatives are guided by explicit development plans.	
SO6	Students are provided with information on e-learning technologies prior to starting courses.	
SO7	Students are provided with information on e-learning pedagogies prior to starting courses.	
SO8	Students are provided with administration information prior to starting courses.	
SO9	e-learning initiatives are guided by institutional strategies and operational plans.	

Table 3.8 Strategies of implementing e-learning scale (Fifth Questionnaire)

Table 3.9 represents questionnaire for e-learning features.

1-ELF\LS-I found the lecture slides in the course website valuable	e-learning features
2-ELF\AC-Assignment components are very important	
3-ELF\PE-Previous exams are useful	
4-ELF\OE-Online exams are good tool	
5-ELF\C-E-Calendar is important tool	
6-ELF\CC-Communication components help me to communicate with others	
7-ELF\GC-Grade centre is very useful	
8-ELF\OA-Online attendance is useful tool	
9-ELF\R-Other resources are very helpful	

Table 3.9 E-learning features scale (Sixth Questionnaire)

3.7.6. Participants in Quantitative Phase

To create a uniform evaluating strategy for e-learning, this research involved 600 participants. The general rule is to recommend that a researcher has at least 10-15 participants per variable. Indeed, Tabachnick and Fidell (2007) report that "it is comforting to have at least 300 cases for factor analysis" (p.613), and Comrey and Lee (1992) categorize 300 as a good quality sample size, 100 as weak and 1000 as high quality.

3.7.7. Mapping Questionnaires Items to Dimensions of the E-learning Maturity Model

Table 3.10 illustrates the mapping of questionnaire items to the dimensions of the e-learning maturity model. Also, it gives selected dimensions developed to measure each factor with representative questions from the quantitative data supporting each one.

Dimensions of the e-learning maturity model	Questionnaire Items
Constructing attitudinal scale for students towards e-learning.	SBeh1- SBeh2- SBeh3- SBeh4- SBeh5 SFee1- SFee2- SFee3- SFee4- SFee5 SOpi1- SOpi2- SOpi3- SOpi4- SOpi5- SOpi6- SOpi7- SOpi8
Constructing a measure for e-learning effects.	ECom1- ECom2- ECom3- ECom4- ECom5- ECom6- ECom7- ECom8- ECom9-ECom10- EEduc1- EEduc2- EEduc3- EEduc4- EEduc5- EEduc6- EEduc7- EEduc8- EEduc9- EEduc10- EOrg1- EOrg2- EOrg3- EOrg4- EOrg5- EOrg6-
Constructing a measure to assess which aspects of e-learning pedagogy are most influential on students.	MBeh1- MBeh2- MBeh3- MCog1- MCog2- MCog3- MCon1- MCon2- MCon3- MCon4- MCon5- MCon6- MCon7- MCon8- MCon9-
Constructing attitudinal scale for faculty toward e-learning.	UBeh1- UBeh2- UBeh3 UFee1- UFee2- UFee3 UOpi1- UOpi2- UOpi3- UOpi4- UOpi5- UOpi6- UOpi7- UOpi8- UOpi9
Constructing a measure of e-learning strategies.	SL1- SL2- SL3- SL4- SL5- SL6- SL7- SL8- SL9- SL10- SD1- SD2- SD3- SD4- SD5- SD6 SS1- SS2- SS3- SS4- SS5- SS6- SE1- SE2- SE3- SO1- SO2- SO3- SO4- SO5- SO6- SO7- SO8- SO9-
Constructing a measure of e-learning features.	1-ELF\LS-2-ELF\AC-3-ELF\PE-4-ELF\OE-5- ELF\C-E-6-ELF\CC-7-ELF\GC-8-ELF\OA-9- ELF\R-

Table 3.10 Mapping questionnaires items to dimensions of the e-learning maturity model

3.7.8. Analysis of the Questionnaire Structure

As already mentioned in previous sections, the questions that are included in these questionnaires and in-depth interviews are summarized in six different groups. These are: (a) "Students' attitudes towards e-learning", (b) "Effects of e-learning on students", (c) "How the e-

learning will be implemented", (d) "University attitude towards e-learning", (e) "Strategies of implementing e-learning, and (f) "E-learning features".

Students' attitudes towards e-learning (First Questionnaire)

This category includes questions that collect information about students' attitudes towards e-learning. Such information includes social isolation, schedule flexibility and technical knowledge. This information is essential for understanding the definitions of e-learning from students' perspectives and using these definitions to further understand the requirements for uniform evaluating strategy for e-learning.

Effects of e-learning on students (Second Questionnaire)

The questions included in this category seek information about the effects of e-learning on students. Initially how often do students use e-learning in their studies? Then, do these benefits of the e-learning from students' perspectives agree with university perspective? E-learning systems involve students from different majors, such as information technology, networks and others, so the most important aspect investigated is students' perspectives from different disciplines. Moreover, any individual differences between students are identified, focusing on e-learning effects.

How the e-learning will be implemented (Third Questionnaire)

Initially, this category of questions investigates in how the e-learning will be implemented. It also investigates the practical implications of e-learning. Moreover, it investigates available models of e-learning. Next, the questions in this category engage in an open discussion with students to identify the attitudes and expectations of students regarding the function of e-learning within their higher education knowledge.

University attitude towards e-learning (Forth Questionnaire)

The questions included in this category aim to record the overall university performance during the experiment, by identifying any obstacles to the implementation of full cooperation and support between lecturers and university. Furthermore, any necessary changes in university structures throughout the project and their main reasons are recorded. Finally information is obtained about how the higher education institutions determine the most suitable environments for e-learning delivery.

Implementation strategies for e-learning (Fifth Questionnaire)

This category of questions has as its main purpose the investigation of the university strategy in relation to achieving a maturity model for e-learning that might improve performance in e-learning implementations. Then, trace the university steps in executing e-learning through exploring the needs and concerns of the participants groups involved. Proposed strategy can be described as the following: a) first, to exploit current teaching technologies in order to improve

educational outcomes; b) to increase returns on existing resources; and c) to keep up with other HE institutions and maintain a competitive position. Furthermore, it is to enhance reputation, improve the quality of teaching and learning, and increasing flexibility.

E-learning features (Sixth Questionnaire)

Initially, this category of questions investigates the pattern of use of a typical e-learning system by students. Also, it investigates the practical implications for e-learning tools. Moreover, it investigates available tools of e-learning.

The following last section of this document provides links between the questionnaires and the dimensions of the maturity model for e-learning that provide the frame of this investigation methodology.

3.7.9. Links between Questionnaires and Dimensions of the Maturity Model for e-learning

This segment consists of two divisions that illustrate and clarify how the different parts of these questionnaires are related to various research subjects that are being currently investigated.

The first part consists of Table 3.11, which provides a more expressive demonstration of the links between dimensions of the maturity model for e-learning and different sets of questionnaires questions. These links exist through specific questions that are included in these questionnaires.

The second part of this section includes a description of the table contents and further explanation of the various links. The main objectives are: (a) to emphasize the significance of the questionnaires for this research; (b) to give good reason for the structure and the content of the questionnaires; and (c) to emphasize the links between the questions and the dimensions of the maturity model for e-learning.

Each table column represents a different part of these questionnaires as explained below in Table 3.11:

A: Students' attitudes towards e-learning (Scale 1).
B: Effects of e-learning on students (Scale 2).
C: How the e-learning will be implemented (Scale 3)
D: University attitude towards e-learning (Scale 4).
E: Strategies of implementing e-learning (Scale 5).
F: e-learning features (Scale 6).

Dimensions of the maturity model for e-learning	A	B	C	D	E	F
Students' attitudes towards e-learning.	✓					
Effects of e-learning on students.		✓				
How the e-learning will be implemented.			✓			
University attitude towards e-learning.				✓		
Strategies of implementation for e-learning.					✓	
e-learning features						✓

Table 3.11 Dimensions of the maturity model for e-learning

Next, the dimensions of the maturity model for e-learning which are included in the above table are briefly discussed, and also the links with these questionnaires questions are identified and explained. Initially, a short description of the issue is included, next the parts that are linked to this issue are outlined and the specific questions are identified. Finally, the reasoning for the existing links is underlined by introducing several assumptions resulting from the questionnaires material.

Students' attitudes towards e-learning.

Attitudes are positive or negative assessments of objects, people, or situation that prompts us to believe and behave toward them in positive or negative ways (Ajzen & Fishbein 1980). The three basic elements of attitudes are cognitive (opinions or beliefs segments), affective (emotional or feeling segment) and behavioural (an intention to behave in a certain way or direction) (Rosenberg & Hovland 1960). Studying attitudes remained an important activity for several researchers of organizational behaviour, management sciences and ICT domains. It has been assumed that attitudes affect users' behavioural intention, which in turn affects users' actual use of the technology (Rainer & Miller, 1996). Important relationships have been identified between computer attitudes and users' satisfaction with information technology, perceived performance and system usage in a number of studies (Compeau & Higgins 1995; Rainer & Miller 1996; Thompson et al. 1994).

Social scientists such as Fishbein and Ajzen, (1975) in their hypothesis of Reasoned Action (TRA), proposes that about an object guides towards an attitude and this further guides to behavioural intentions concerning the object and finally these intentions affect the real behaviours toward the object or target. In other words, we can forecast the behaviour from attitudes. In the same context, some other studies studied the function of attitude on information technology rather than discussing the attitudes toward computers in general (Taylor & Todd 1995a 1995b). In particular, several other studies have highlighted students' attitudes towards computer (Roberston et al. 1995; Todman & File 1990; Kirkman 1993; Gattiker & Hlavka 1992; Jones and Clarke 1994; Francis 1993; Selwyn 1997).

Data collection began in this step first through the questionnaire of students at the college of applied science in Oman. This questionnaire helped measure students' attitudes toward e-

learning, and was conducted via three different pathways: Behaviour, Feelings, and Opinions. The quantitative data gathered from the first questionnaire informed the first dimension.

Effects of e-learning on students

Many research studies conducted to compare the performance of e-learning students to that of students using a traditional learning method would recommend that e-learning does not negatively affect performance and indeed in many cases develops performance, even if not significantly (Saunders & Klemming 2003; Koshal et al. 2004; Chou and Liu 2005; Davies & Graff 2005; Pugh et al. 2005). Cox et al. (2004) report that communication should be included as part of e-learning otherwise students will not see the need to join. Forums and group dynamics have affected student participation with online synchronous or asynchronous communication found to be more suitable for encouraging social consistency. Also, Ehrlich (2002) reports that much of the communication between instructors and students is social interaction and states that reaction from instructors is a major concern for students. Also students observed that they could more simply create a correlation with an instructor in a face-to-face setting than via e-learning.

Brown et al. (2004), in a study of web-based communication apprehension state that computer apprehension has been shown to have a harmful influence upon an individual's use of e-learning. The purpose of the communication is an important factor where social or informal uses were found to cause less anxiety. To encourage student communication, instructors need to contribute equally in the discussions (Williams 2002). E-learning instructors should be sensitive to the various communication paradigms used by their students (Rovai 2001). In the same context, Kandies and Stern (1999) have declared that e- learning improves instruction and course management and offers many pedagogical benefits for students. They explain that students in e-learning environments are likely to become more active and self-directed learners.

Sanders and Morrison-Shetlar (2002) examined student attitudes with regard to the e-learning component. Their results showed an optimistic effect on student learning, problem-solving skills, and critical thinking skills. Derouza and Fleming (2003) both found that students' marks through quizzes online are significantly better than students who took the traditional quizzes. Moreover, learning is supported by electronic technologies through three methods: fully online, mixed mode and web assisted. On the other hand, the usage of learning technologies can convert the perception of teaching and learning by reformulating the role of the teacher (Anastasiades & Retalis 2001) where learning moves from a behaviourism linear model, which treats students as products on an assembly line, to a more constructivist approach promoted by web-based instruction where learning is a more genuine self-directed knowledge (Anastasiades & Retalis 2001; Buzzetto-More & Sweat-Guy 2006; Connolly & Stansfield 2007; DeVillers 2007; Koohang & Harmon 2005; Lewis et al. 2005). The results of the Salaway and Caruso (2007) ECAR study agrees with the result of research which shows that students prefer the blended learning model. In addition, a number of educational technology experts declare that the blended

learning model offers the most superior method of delivering modern education (Buzzetto-More & Sweat-Guy 2006; Lorenzetti 2005; Young 2002).

Data collection began in this step through the second questionnaire of students at the College of Applied Science. This questionnaire helped determine the effects of e-learning on students. The questionnaire was conducted using four different pathways: Usages, Interactions, Satisfaction, and Features. The purpose in the questionnaire was to help determine e-learning effects and the quantitative data gathered from questionnaire informed second dimension.

How the e-learning will be implemented?

There are many strategies presented to institute e-learning environments (Duchastel 1997; Berge 1998; Collis & Moonen 2001, Liu 2001, Mishra 2001). Pulist (2001) has recognized the design and improvement, educational, technological, managerial and institutional issues as mechanisms for effective online learning environment. Powell (2001) supplies a blueprint of design concepts for e-learning environments, whilst Byun et al. (2000) explain the following points for e-learning enhancement process:

- Begin the development early.
- Investigate the minimum technologies available to students
- Assemble essential organizational and technical support, both for students and instructors
- Develop a plan for assessing student learning and course quality
- Look for models and colleagues
- Announce course offerings in both traditional and online modes
- Arrange for necessary copyright permissions
- Spotlight on the management of instructor-student communication
- Assist faculty in their works to become self-supporting
- Organize for usability testing with potential and experience student of the course

In the same context, Weston and Baker (2001) explain lessons for developing e-learning. The lessons are:

- Familiarize yourself with what is available.
- Focus on education not technology
- Organize a storyboard
- Test the usability
- Assess the learning objectives

Although several studies have been conducted on e-learning, hardly a few studies have examined and surveyed learning theories in their sampling frame. So, this dimension focuses at eliciting the views of the end-users about learning theories. Data collection began in this step through fourth questionnaire of students at college of applied science. This questionnaire helped measure the students' awareness toward behaviourism, cognitivism and constructivism. The questionnaire conducted via three different pathways: Behaviourism, Cognitivism and Constructivism. The quantitative data gathered from questionnaire informed third dimension.

University attitudes towards e-learning

There are number of researches (Olcott & Wright 1995; Fabry & Higgs 1997; Pajo & Wallace 2001; Sellani & Harrington 2002; Naidu 2004; Kosak et al. 2004; Jamlan 2004; Lee & Busch 2005) which have enlightened obstacles to staff contribution in e-learning. Yet there is no uniform tool to measure university attitude towards e-learning. So if instructors are not comfortable with the e-learning tools, students may suffer leading to a poor reputation for the university. Optimistic attitudes can help instructors to deal with e-learning with less pressure and so enable them to take steps correctly in tune with the need of the students and the university (Mishra & Panda 2007).

For that reason the goal of the present step is to offer powerful method of assessing faculty attitudes towards e-learning as a step for creating integrated uniform evaluating strategy for e-learning. While the development of a questionnaire based on literature review is an obligation, it is not sufficient for defining the mechanism of a measurement tool. Therefore, a succeeding step is to determine the internal components of the attitude for determining future predictability of the instrument. For this purpose, this research followed the three basic components of attitudes suggested by (Rosenberg & Hovland 1960).

Data collection began in this step through the questionnaire of staff teaching at the college of Applied Science. This questionnaire helped determine the university attitude towards e-learning. The questionnaire was conducted using three different pathways: Opinions, Behaviours and Feelings. The purpose in the questionnaire was to help determine the staff attitudes towards e-learning. In the same context the quantitative data gathered from the questionnaire informed the fourth dimension.

Strategies of implementing e-learning.

How do we assess our growth in e-learning? In terms of e-learning innovation, the research was well-timed to see where we were and how we evaluated in comparison with others. The problem facing Middle Eastern universities, in common with other educational institutions, is that many of the things which are easy to measure (e.g. numbers of students, courses, page hits and so on) only provide quantitative data: it is extent of use but not qualitative data and does not indicate the depth of use. Quality in provision of infrastructure can be gathered from a range of sources. For example, it is interesting to note that the e-learning market in the United Arab Emirates (UAE) alone is currently estimated to be $14 million and is expected to increase to $56 million by 2008. On the other hand, this recognizes the excellent work carried out to ensure technical environments are firmly in place. It was significant that we also reflected on how effectively that technology impacted on students' knowledge, as well as on teaching and learning across the university, as those qualitative things are hard to assess.

Depending on previous debate, data collection began in this step through the questionnaire of staff teaching at College of Applied Science. This questionnaire helped evaluate the university

strategy towards e-learning. The questionnaire conducted via five different pathways: Learning, Development, Support, Evaluation, and Organization. The purpose in the questionnaire was to help in evaluating the university strategy towards e-learning. In the same context, the quantitative data gathered from the questionnaire informed the fifth dimension.

E-learning features.

This dimension aims to go some way toward responding to this call by systematically examining students' perceptions and engagement with a typical e-learning platform. In doing so, this survey will specifically address the following questions:

What is students' frequency of usage of e-learning system?

What is the awareness of students of the different components of a typical e-learning system?

3.7.10. Validity and Reliability of the Survey Instrument

A pilot study involving staff and students were conducted in order to check how long the process of collecting data would take, to collect respondents' feedback in order to be used to revise the survey's content, and to verify the validity and reliability of the survey instruments. The respondents' feedback helped to improve the quality of the survey in terms content coverage and content validity of the scales as well as detecting some language and technical mistakes.

Validity refers to "the extent to which a test measures what it is intended to measure" (Ary, Jacobs, and Razavieh, 1990, p. 268).

The first scale that measures the students' attitudes toward e-learning was mainly developed from various questionnaires which have been used in the studies conducted (Jones 2007; Francis 1993; Paris 2004; Seyal 2002) to examine the attitudes of students towards e-learning.

The second scale that measures effects of e-learning on students was mainly developed from a mixture of questionnaires which have been used in the studies conducted (Elango et al. 2008; Lee et al. 2005; Chou & Liu 2005; Buzzetto-More 2008) to examine the effects of e-learning.

The third scale that measures how e-learning will be implemented was mainly developed from diverse researches which have been conducted (Mishra & Jain 2002; Partridge & Edwards 2005; lefoe 1998; Modritscher 2006; Nam & Smith-Jackson 2007; Hodges 2004; Ghaleb et al. 2006; Alderman & Milne 1999) to measure the influence of structure and semantic effects of e-learning on knowledge construction.

The fourth scale that measures university attitude towards e-learning was mainly developed from a variety of questionnaires which have been used in the studies conducted (Mishra & Panda 2007; Sharma 2006; Lertlum & Papasratorn 2005; Elango et al. 2008) to examine the attitudes of faculty members towards e-learning.

The fifth scale that measures e-learning strategies was mainly developed from studies conducted (Marshall & Mitchell 2007) to examine e-learning procedures.

The sixth scale that measures e-learning features was mainly developed from studies conducted (Ituma 2011) to examine e-learning features.

Reliability refers to the consistency of the measuring instrument. Ary, Jacobs and Razavieh (1990) defined the reliability of the measuring instrument as "the degree of the consistency with which it measures whatever it is measuring" (p. 268). The reliability of the quantitative data (the six scales of the surveys) in this study was ascertained by finding Cronbach's Alpha of a pilot study data. "Cronbach's Alpha is the most widely used measure of reliability that measures the internal consistency reliability" (Aron, Aron & Coups 2005 p. 383).

The pilot study includes 30 students in Oman University studying applied science. Cronbach's Alpha was determined using the SPSS20 statistical package. Before finding the Cronbach's Alpha of the pilot study data, the scoring of all negatively stated items in the attitudes toward e-learning as well as the perceived value of internet-based distance education scales, were reversed. "In the social and behavioural sciences, a good measure should have a Cronbach's Alpha of at least .6 or .7, but preferably closer to .9" (Aron, Aron & Coups 2005, p. 383). Based on the collected data from the pilot study, Cronbach (α) was .76 for samples.

3.7.11. Data Analysis for Quantitative Phase

Both descriptive and inferential statistics were used for analyzing the quantitative phase of this research. Descriptive statistics were used to review and express the data collected from the respondents (Aron, Aron & Coups 2005). Also, these were used to describe the participants' demographic characteristics using the mode and frequency distribution.

On the other hand, inferential statistics were used to draw conclusions about the dimensions for the maturity model of e-learning, based on the collected data from the sample respondents (Aron, Aron, & Coups 2005). Also, it will confirm or invalidate the answers for the first and second research questions. Moreover, it was used to examine the relationship between the hypotheses. Several techniques may exist in inferential statistics; for example, factor analysis is a multivariate statistical approach commonly used in psychology and education. It is a significant tool that can be used in the development, refinement and evaluation of tests, scales and measures that can be used in education (Williams et al. 2010). Also, factor analysis is considered the method of choice for interpreting self-reporting questionnaires. "… Factor analysis is intimately involved with questions of validity … It is at the heart of the measurement of psychological constructs". (Nunnally 1978, pp. 112-113).

Thus, the Exploratory Factor Analysis (EFA) method will be used in this research for the following reasons: factor analysis shrinks a large amount of variables into a smaller set of variables (also referred to as factors); it creates underlying dimensions between measured

variables and latent constructs, thereby allowing the configuration and modification of the maturity model of e-learning theory; and it provides construct validity confirmation of self-reporting scales. Usually in EFA, the investigator has no expectations of the number or nature of the variables and, as the heading suggests, is exploratory in nature. That is, it allows the researcher to investigate the main dimensions to produce a theory, or model, from a relatively large set of latent constructs often represented by a set of items (Williams et al. 2010). Also a correlation matrix should be used in the EFA process for displaying the relationships between individual variables.

There are numerous ways to extract factors: principal components analysis (PCA); principal axis factoring (PAF); image factoring; maximum likelihood; alpha factoring; and others.

PCA is a method for summarizing data in fewer variables with minimum loss of information or for determining the number of dimensions. It will be used in this research for the following reasons: a) PCA is most commonly used in EFA (Thompson & Daniel 1996); b) PCA is also recommended when no priori theory or model exists (Glorfeld 1995); and c) Pett et al. (2003) suggested using PCA in establishing preliminary solutions in EFA.

Also, there are two common rotation techniques in EFA: orthogonal rotation and oblique rotation. Researchers have several methods to choose from both rotation options; for example, orthogonal varimax/quartimax or oblique olbimin/promax. Orthogonal Varimax rotation, first developed by Thompson, is the most common rotational technique used in factor analysis, which produces factor structures that are uncorrelated (Costello & Osborne 2005). In contrast, oblique rotation produces factors that are correlated, which is often seen as producing more accurate results for research involving human behaviours, or when data does not meet prior assumptions (Costello & Osborne 2005). Depending on the previous points; principal component analysis was used as the means of extraction and promax was used as the method of rotation.

The SPSS 20 statistical package was used to carry out all the statistical analysis. An alpha level of .05 was selected by the researcher, where an alpha level of .05 is generally considered acceptable in behavioural and social science research (Aron, Aron, & Coups 2005). Before conducting the analysis, the scoring of all negatively stated items in the questionnaires was reversed.

3.8. Summary

The indicators from this research also suggest that there may be other perspectives to consider in developing effective e-learning.

In fact, it may not be that number of students or faculty involved in a program are good indicators of the e-learning program but rather the extent to which the mission of that e-learning program is considered essential to the overall mission of the institution. Identifying and defining

new dimensions for the maturity model of e-learning (such as students' attitudes, effects of e-learning, e-learning models, university attitudes and e-learning strategies) can provide additional insight into understanding successful model for e-learning.

Moreover, the findings of this study related to students' attitudes, effects of e-learning, models of e-learning, university attitudes, and e-learning strategies offer compelling implications and potential guidance for universities who would design, develop, and administer e-learning. Viable e-learning have effective model, are well integrated into the university, and are responsive to change both within the university and in society. Although these characteristics may have always distinguished effective programmes, it now appears that they are necessary for a program to survive. In this time of change in higher education, it is also hoped that these findings will serve as a basis for continued discussion about the how to assess e-learning to address the challenges facing e-learning, provide opportunities for critique and innovation, and open the possibilities for universities to reconceptualise e-learning model.

Therefore, the exploratory sequential design is well- suited when there is little pragmatic knowledge about an exacting research area; i.e. lack of a theoretical framework, instruments, or variables (Creswell & Plano Clark 2007). Researchers decide to employ an exploratory sequential design when they need to first investigate a phenomenon qualitatively before they can evaluate or test it (Creswell, Plano Clark et al. 2003; Morgan 1998). This design is frequently used when designing an instrument and is a vital feature of the overall study (Creswell 1999; Creswell et al. 2004). Exploratory sequential designs begin with a qualitative, comprehensively exploration and subsequently construct a succeeding quantitative stage that is connected to the initial qualitative results.

Given the nature of this research- an in-depth study of a contemporary phenomenon (e-learning), in a complex environment (university), with little pragmatic knowledge about an exacting research area (uniform evaluating strategy for e-learning), and with other staff who will form part of the study placing it in the context of a complex environment, and where the underlying research philosophy is based on an interpretive understanding of a phenomenon - a strategy that meets the needs of this research should have an exploratory sequential design. As discussed previously, the exploratory sequential design approach provides the focus that is required, emphasizes depth of study, is based on the assumption that reality can only be understood through social constructions and interactions, and that the context in which the phenomena under study is situated is complex.

The next chapter explains the qualitative data analysis and results.

Chapter Four Qualitative Data Analysis and Instrument Development

In the preceding chapter the research methodology was discussed, demonstrating the research stages and methods. It included how the research data were collected through a combination of in-depth interviews and questionnaires. It also included how the research tools were constructed and validated through the research. Moreover, the research methodology chapter included the procedures by which the research was executed, including the selection of the research sample and the conduct of the research main study (in-depth interviews and questionnaires).

This chapter presents the findings of the research survey including the in-depth interviews results. It discusses responses received from students and staff who participated in the in-depth interviews and how these responses were used to answer the research question (what are criteria affecting the introduction of maturity model in the deployment of e-learning in Middle Eastern countries?). The next section introduces the philosophical concepts for analyzing qualitative data.

4.1. Introduction

Because of a peculiarity in the English language, the phrase "qualitative data analysis" is mischievously ambiguous (Bernard and Ryan 2010). It can indicate "the analysis of qualitative data" or it can mean "the qualitative analysis of data." The misunderstanding can be removed by differentiating clearly between data and analysis. Table 4.1 lays out the possibilities.

As the table shows, the top left cell, A, shows the qualitative analysis of qualitative data. Interpretive studies of observations, interviews are of this type. Investigators focus on and name themes in texts. They describe the event as they see it, of how the categories are related to one another and how personalities of the speaker or speakers account for the existence of certain categories and the lack of others. The bottom right cell, D, indicates to numerical analysis of numerical data. Lots and lots of data about human attitude come to us as statistics. Closed- ended questions in surveys create numerical data.

Analysis	Data	
	Qualitative	Quantitative
Qualitative	(A) Interpretive text studies. Hermeneutics, Grounded Theory, etc. *First Research question "what are criteria affecting the introduction of maturity model in the deployment of e-learning in Middle Eastern countries?"*	(B) Search for and presentation of meaning in results of quantitative processing
Quantitative	(C)Turning words into numbers. Classic Content Analysis, Word Counts, Free Lists, Pile Sorts, etc.	(D) Statistical and mathematical analysis of numeric data *Second research question "To what extent could these criteria measure maturity level in e-learning?"*

Table 4.1 Key qualitative and quantitative distinctions

SOURCE: Adapted from: Bernard, H. R., and Ryan, G. W. (1996). Qualitative data, quantitative analysis. Cultural Anthropology Methods Journal, 8(1), 9– 11. Copyright © 1996 Sage Publications.

The top right cell, B, is the qualitative analysis of quantitative data. It is what quantitative analysts do after they get through doing the work in the quantitative/ quantitative cell, D, and it engages the search for, and the production of, meaning in the outcomes of quantitative data processing. The qualitative/ quantitative cell, B, holds the whole thing, from the finding of regularities in a scatter plot to the clarification of meaning and substantive implication of statistical tests. Moreover, Bernard and Ryan (2010) said that "without the work in the qualitative/ quantitative cell, the kinds of studies shown in the quantitative/ quantitative cell are weak and blank", which leaves the bottom left cell, C, as the quantitative analysis of qualitative data. This involves turning words, images, sounds or objects into numbers.

Depending on the preceding debate, in this phase we will be mostly concerned with cells A (qualitative/ qualitative), to answer first research question and cell D (quantitative/ quantitative) to answer the second research question. In the same context, we discuss to what extent and in what ways the quantitative results generalize or test the qualitative results. In other words, this chapter presents the findings of the research in-depth interviews and the main qualitative phase results. It discusses responses received from students and staff who participated in the in-depth interviews and how these responses were used to answer the research question.

In this research, steps C and D were proved, the qualitative data was collected and analyzed, and then this information was used to develop a follow up quantitative phase of data collection. The quantitative phase thus connects to the initial qualitative phase. Like the explanatory design, three analyses are directed: after the initial qualitative data collection, after the follow-up

quantitative data collection, and at the interpretation phase when this research connects the two databases to address how the follow- up analysis helps to generalize or extend the initial qualitative exploratory findings.

Qualitative data analysis is described in detail later in this chapter. Firstly, to help the reader conceptualize Chapter 4, its hierarchical structure is presented as a flow chart in Figure 4.1 below.

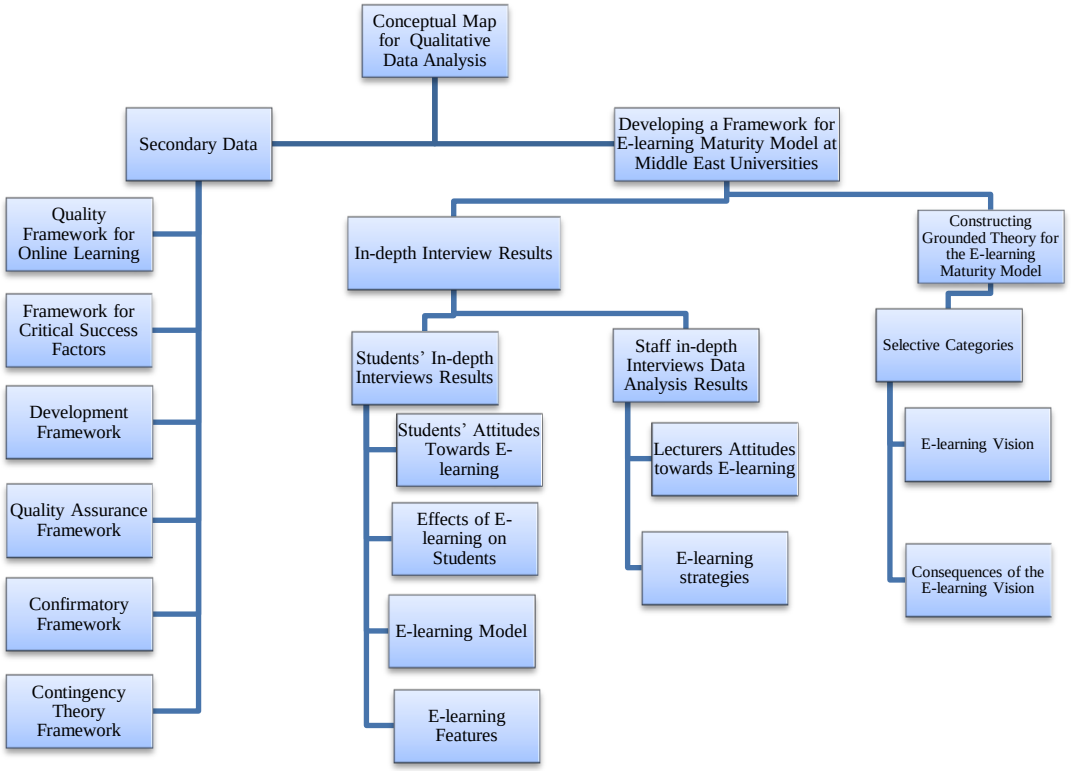


Figure 4.1 Conceptual Map for Qualitative Data Analysis

Figure 4.1 illustrates the layout of chapter 4 in a linear format where topics contained links to sub- topics. The map provides an overview of qualitative data analysis using a series of interrelated blocks. The purpose of the review is stated at the top of the map and leads into the other blocks. Emanating from the qualitative data analysis block are the links to other steps, which helped inform the results.

The next section discusses the literature reviews that showed factors affecting e-learning development and, based on these reviews, a framework of six categories of factors was suggested.

4.2. Secondary Data

Bernard and Ryan (2010) explained that there are three broad groups of methods for assembling data about human thought and human behaviour. These are: (1) indirect observation; (2) direct observation; and (3) elicitation, or talking to people. Many studies involve a combination of these three major types of methods. Indirect observation involves (1) studying the traces of human behaviour and thought; (2) analyzing archival data; and (3) secondary analysis, or reanalyzing data collected for other researches.

Hence, to create a successful, open, flexible and distributed e-learning environment for diverse learners, we must explore key factors encompassing various dimensions of e-learning environment (Khan 2005). In the same context, some of the secondary data on the effectiveness of e-learning refer to these factors by using the term "e-learning model" (ELM). It refers to the personal and individual dimensions or angles that are essential for an organization to be successful in accomplishing its goals. Relating to this, several researchers have raised the issue of what affects the success and quality of e-learning systems, and, furthermore, have suggested different sets of angles to be influential to the success and quality of e-learning systems. Therefore, the most important reason for using secondary data analysis in this research is to provide bases for comparison between different models for e-learning maturity model which help in reformulating suited model for Middle Eastern universities.

The next part of this chapter reviews the secondary data of some of these researches and how they approach e-learning model.

4.3. Developing a Framework for E-learning Model

The following review of the secondary data includes a discussion of researches that focus on different angles affecting the deployment of e-learning at several levels (adoption, implementation, development and evaluation). While several dimensions are raised through this secondary data, there is evidence that there is an agreement between these studies on the existence and importance of certain dimensions.

4.3.1. Quality Framework for Online Learning

In 2000, the Institute of Higher Education Policy (IHEP) in Washington, DC, prepared a report spotlighting the quality of online learning programmes by suggesting essential standards critical to offer quality e-learning. The final set of standards was clustered as follows: Based on IHEP (2000) Institutional support benchmarks; Course development benchmarks; Teaching/learning process benchmarks ; Course structure benchmarks; Student support benchmarks; Faculty support benchmarks and Evaluation and assessment benchmarks. It is worth mentioning that the methodology followed by IHEP (2000) in identifying e-learning quality was benchmarks but nothing involving with measurement methods.

4.3.2. Framework for Critical Success Factors

In another study, Oliver (2001) proposes a number of critical factors to be considered in e-learning in order to maximize opportunities and minimize risks associated with adopting e-learning. Oliver (2001) prepared a discussion of issues that need consideration in order to create a successful process of e-learning uptake. He clustered these issues into five segments: Teacher Expertise, Student Readiness, Technology Infrastructure, Reusable Learning Objects, and Reusable Learning Design. It might be suggested that Oliver (2001) omitted the institutions' attitudes towards e-learning, which could represent a gap in terms of policies, strategies, management, assessment and evaluation needed to maintain a successful implementation of e-learning.

4.3.3.Development Framework

Similarly, Badrul Khan (2001) introduced an e-learning model which was based on consideration of different aspects and issues that affect the development and success of e-learning systems. Khan (2001) proposed that e-learning development is affected by a set of factors which can be classified into eight dimensions: Pedagogical; Technological; Interface Design; Evaluation; Management; Resource Support; Ethical; and Institutional. The overall conclusion that might be raised is that Khan (2001) tried to explore every single element related to e-learning, which might have resulted in a large number of interrelating factors without reference to the methods which can be used to measure the effects of these factors.

4.3.4.Quality Assurance Framework

This concept is supported by a study by Fresen (2005), who conducted a study that explored quality assurance of online learning programmes through evaluating e-learning at the University of Pretoria in South Africa. The evaluation was based on a framework that gathers critical success factors of online learning. The evaluation was conducted using a valid questionnaire on a sample of 4651 respondents at the end of three semesters. The framework used was prepared based on a review of literature that approached e-learning quality assurance from different angles. It consists of six main categories of factors: Institutional Factors, Technology Factors, Lecturer Factors, Student Factors, Instructional Design Factors, and Pedagogical Factors. The overall conclusion is that Fresen (2005) tried to explore quality assurance of online learning programmes, which might have resulted in a number of pointers for quality assurance but also without measurement tools or explanations of relationships between these factors.

4.3.5.Confirmatory Framework

In the same context, Selim (2007) in a confirmatory factor model study, tests four categories of critical success factors from the students' point of view (perception). The study was carried out at the University of the Arab Emirates with 538 respondents from different courses. The factors tested were: student characteristics (technology competency and interactive

collaboration); instructor characteristics (attitudes towards and control of technology, and teaching style); technology (ease of access, design and infrastructure); and university support (policies formulated by the institution to ease and facilitate e-learning courses).

4.3.6. Contingency Theory Framework

Lastly, Boezerooij (2006), in her PhD thesis which was later published as a book, presents a contingency theory of factors that could influence higher education institutions' strategies for adopting e-learning. She developed her model based on literature and studies that explored key characteristics and influential variables of e-learning. She divided these variables in two groups: independent and dependent. The dependent variable is the strategic choice of the institution. The independent variables include external and internal contingencies. The internal contingencies are related to the institutions' characteristics and profile, in terms of flexibility, human resource management, work atmosphere, lifelong learning support, research oriented policy, and adequate assessment and evaluation methods. It also includes the use of technology within the institution and pedagogical flexibility of content. On the other hand, the external contingencies include: technological factors such as connectivity and access to internet; demographical factors such as diversity among students population; economic factors such as public spending; a government factors such as policies, incentives and national factors.

4.4. Results of Secondary Data

Through this review of secondary analysis, it might be noticed that each model or theory has raised a group of factors deemed essential for successful adoption and development of e-learning systems. In addition, some differences in the nature, categorization and focus of these dimensions were evident. Also, some factors have gained agreement from some or all of the researchers in these studies which helped in suggesting a theory that includes all factors deemed critical for e-learning deployment.

The educational institutes' strategies regarding adopting and executing e-learning, which also include many dimensions and angles of support and encouragement, could be clearly noticed through several studies (IHEP 2000; Khan 2001; Fresen 2005; Selim 2007; Boezerooij 2006). All of these studies highlight the importance of the university function in supporting e-learning in terms of student support, faculty support, course support, course management, resources and evaluation.

The educational factors, in terms of course presentation, content structure, feedback management and student interaction, also gained the agreement among several studies (IHEP 2000; Khan 2001; Fresen 2005).

The most accepted category of dimensions which was raised by all research in this area is the technological infrastructure factors. This situation of agreement could be justified very simply by

saying that, without sufficient technological infrastructure, e-learning courses might not be possible.

Also, the execution of e-learning was considered as an important factor throughout most of the secondary data (IHEP 2000; Khan 2001; Oliver 2001; Fresen 2005; Selim 2007).

Despite the different dimensions from which these studies approached the e-learning execution, the conclusion tends to stress the importance and criticality of the methods for implementing e-learning.

Moreover, the socio-technical framework that affects and influences the implementation and success of e-learning has been approached from several angles and at different levels throughout the secondary data. IHEP (2000), Khan (2001), Oliver (2001) and Fresen (2005) approached socio-technical issues from the individual perspective, by focusing on the importance of knowing the student and tutor readiness, competence and attitudes towards using e-learning, and also in terms of their characteristics and how to consider these characteristics in the e-learning implementation. From another perspective, Selim (2007) and Boezerooij (2006) looked to the socio-technical variables to provide the whole picture, in terms of the demographical characteristics of the program users and how they affect success. These two approaches might lead to a suggestion that the student, lecturer/tutor and demographical factors address the overall issue of socio-technical variables that influences the success of e-learning.

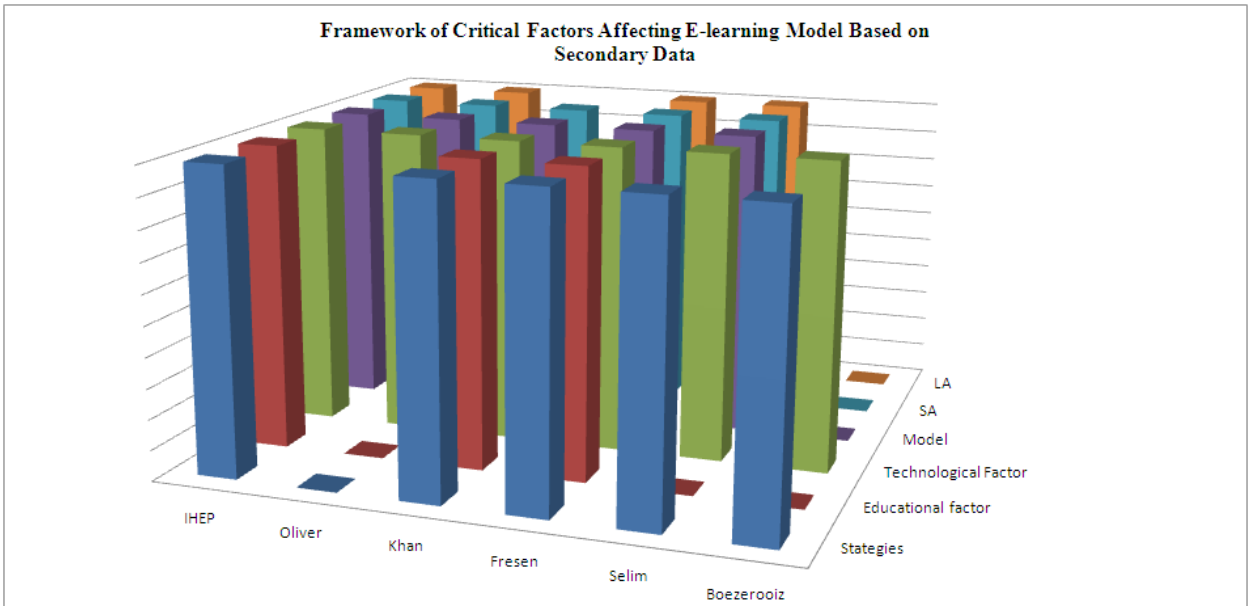
The occurrences of these factors among the studies reviewed are summarized in Table 4.2.

Dimensions / Secondary Data	The educational institutes' strategies	The educational factors	Technological infrastructure factors	Methods for implementing e-learning	The socio technical Factors	
					Students' attitudes(SA)	Lecturers' attitudes(LA)
(IHEP 2000)	✓	✓	✓	✓	✓	✓
Oliver (2001)	×	×	✓	✓	✓	✓
Khan (2001)	✓	✓	✓	✓	✓	×
Fresen (2005)	✓	✓	✓	✓	✓	✓
Selim (2007)	✓	×	✓	✓	✓	✓
Boezerooij (2006)	✓	×	✓	×	×	×

Table 4.2 Agreement on different dimensions among secondary data

Based on this table, which was developed from the analysis of the secondary data, these researches have suggested a set of categories of dimensions deemed critical when developing a theory for e-learning. These categories of dimensions include: the following strategies and factors. The educational institutes' strategies: in terms of policies and procedures to be followed to guarantee sufficient support and encouragement by the institution for e-learning implementation. The educational factors: in terms of course construction, appearance and management. Technological infrastructure factors: in terms of all aspects needed to provide sufficient infrastructure to ease and support e-learning. Methods for implementing e-learning factors: in terms of standards and learning theories to be followed and considered in designing e-content. Socio-technical factors: in terms of knowing the attitudes of learners and tutors and their society, plus their readiness and behaviour toward e-learning.

Figure 4.2 represents the framework suggested by the secondary data. Although the preceding researches have explained critical factors affecting e-learning model, it is difficult to use these models to explain the relations between these factors. Moreover, we can't measure the effect of each factor. Therefore, this model can't explain the approach or underlying factors behind the e-learning maturity model. In other words, most of these models have no exploratory or confirmatory statistical models.



	IHEP	Oliver	Khan	Fresen	Selim	Boezerooiz
Stategies	1	0	1	1	1	1
Educational factor	1	0	1	1	0	0
Technological Factor	1	1	1	1	1	1
Model	1	1	1	1	1	0
SA	1	1	1	1	1	0
LA	1	1	0	1	1	0

Figure 4.2 Framework of Critical Factors Affecting E-learning Model Based on secondary data

4.5. Developing a Framework for the E-learning Maturity Model at Middle Eastern Universities

In the previous section, a secondary data review was conducted focusing on the factors affecting the deployment of e-learning. From this review, a framework including many categories of factors deemed critical for e-learning deployment emerged. The next section was conducted focusing on the Middle East. It discusses the state of the Middle East in terms of students' attitudes; effects of e-learning on students; e-learning models; university attitudes; e-learning features; and e-learning strategies. At the end of this section, the framework proposed in the previous section was modified to account for the Middle Eastern state of readiness. Some factors emerged and some merged, resulting in an adaptive framework of factors which might affect e-learning deployment in Middle East.

As the main focus of the research is the Middle East, it was important to build a comprehensive background of the Middle Eastern current state of e-learning readiness from different angles. The framework developed based on Figure 4.2 acted as a guide to inform where and what to search for in the Middle East.

In order for the research to develop a maturity model for e-learning in higher education in the Middle East, it was essential to answer two main questions:

1. What are criteria affecting the introduction of a maturity model in the deployment of e-learning in Middle Eastern countries?

2. To what extent could these criteria measure maturity level in e-learning?

To answer these questions, a review was conducted of some of the literature resources that discussed the factors affecting e-learning development in several countries (UK, USA, New Zealand, Egypt, Bahrain and Oman). The review concluded that there were certain factors that most of the literature sources reviewed agreed upon, in terms of its importance for the adoption and development of e-learning. These factors were summarized in the framework of factors affecting e-learning development introduced in preceding section.

The review focus was narrowed to the Middle East case to engage in e-learning in terms of students' attitudes, effects of e-learning on students, e-learning models, university attitudes, e-learning features and e-learning strategies. The conclusion, made based on this narrowed review, was that the basic framework suggested earlier needs some modifications to align with Middle East. As a result, the framework was modified, producing the e-learning maturity model for the Middle East which includes a framework of factors affecting e-learning deployment in this region.

The next step was to verify the validity of the Middle East framework in a fieldwork survey to see if these dimensions actually existed and how the university community perceives these dimensions. The following sections include the presentation of the results obtained from the research survey using in-depth interviews regarding the factors affecting e-learning maturity model in Middle East.

4.6. Philosophical Underpinnings for Research Methodology

Surprisingly, an the extensive review of the research literature revealed no article in which mixed methods research had been used for exploring e-learning maturity model. Thus, what follows appears to be a first attempt to provide such a discussion. Generally speaking, mixed methods research questions are questions that embed both a qualitative research question and a quantitative research question within the same research. Mixing qualitative and quantitative methods can improve a study that is suitable to both paradigms (Teddlie &Tashakkori 2003).

Johnson and Onwuegbuzie (2004) rightly state "a tenet of mixed methods research is that researchers should mindfully create designs that effectively answer their research questions" (p. 20). In this research, a qualitative method was the central approach used to explore dimensions of an e-learning maturity model. A quantitative approach was also employed to measure maturity level in e-learning. In recent years, mixed method approaches have appeared, due in part to the

identification of some obstacles and strong points of both qualitative and quantitative approaches (Teddlie & Tashakkori 2003).

Qualitative research is inadequate in its capability to generate findings that can be generalizd to bigger populations, though it benefits from its capability to transport further significance and accounts of live experiences that normally do not come up from quantitative research. However, quantitative study has been observed by some as the benchmark of "quality" study (Ayer 1959; Maxwell & Delaney 2004; Schrag 1992).

Quantitative researchers have debated that "social observations should be managed as entities in much the same way as those physical sciences manage physical events" (Johnson & Onwuegbuzie 2004, p. 14). A number of obstacles of the quantitative model have been recognized, principally centring on the awareness that the researcher cannot be assumed to be isolated from the object of observation (Creswell et al. 2003; Miles & Huberman 1994). That said, the quantitative approach has several strengths: "testing and validating already constructed hypothesis; generalizing a research finding when it has been replicated on many different populations and subpopulations; and research results that are relatively independent of the researcher" (Johnson & Onwuegbuzie 2004, p. 19).

In order to meet the aim of this study, the exclusive strong points of both qualitative and quantitative paradigms can be successfully combined to minimize their particular boundaries while emphasizing their strengths in a mixed method design. The primary objective of mixed methods in this research is to obtain a more complete understanding of staff and student behaviour and experience by using more than one method within a research study.

> Creswell et al. (2003) define a "beginning point" of mixed methods study:
>
> A *mixed methods study* involves the collection or analysis of both quantitative and/or qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research. (p. 212)

The mixed methods paradigm has risen, in part, from the distinctions drawn between the "*positivist/empiricist* approach and the *constructivist/phenomenological* orientation" (Tashakkori & Teddlie, 1998, p. 3). The positivist view is the centre for quantitative methods, and the constructivist philosophy underlies qualitative methods (Johnson & Onwuegbuzie 2004). While these philosophical distinctions have, in the past, led researchers to view the two paradigms as basically mismatched, other researchers have taken a more moderate stance and argued that quantitative and qualitative methods are in fact well-matched (Howe 1988; Reichardt & Rallis 1994). This paradigm shift has been named "pragmatism" (Johnson & Onwuegbuzie 2004).

Therefore, in regard to pragmatism, Johnson and Onwuegbuzie (2004) state that "the bottom line is that research approaches should be mixed in ways that present the best opportunities for answering significant research questions" (p. 16). Similarly, Johnson and Turner (2003) argue that a basic principle of mixed method research is that "methods should be mixed in a way that has complementary advantages and no overlapping disadvantages" (p. 297).

In the same context, Creswell and Plano Clark (2011) identified six different types of mixed method designs that a researcher might employ. The designs are sequential explanatory, sequential exploratory, convergent parallel design, embedded design, transformative design, and multiphase design. They also note that the sequential exploratory design is performed in two stages. However, this design is characterized by an initial phase of qualitative data collection and analysis followed by quantitative data collection and analysis. The main concern is given to the qualitative portion of the study, and the findings of the two phases are then incorporated in the explanation phase. The purpose of this design is to employ quantitative data and results to support the explanation of qualitative findings. The sequential exploratory design is suitable to apply when examining components of developing theory and it can also be used to generalize qualitative findings to different populations (Creswell et al. 2011; Johnson & Onwuegbuzie 2004; Teddlie &Tashakkori 2003).

The sequential exploratory design was used in this research. The exploratory emphasis of this design was an excellent fit in this research because of its congruency with the qualitative phase of this research. The goal of capturing the live experiences of students and academic staff was enhanced as a consequence of enriching the qualitative reports with the quantitative data through this design.

Thus, the next section arranges the theoretical framework, outlines the stages of qualitative data analysis and the steps that were taken in order to address the first research question, "What are the criteria affecting the introduction of maturity model in the deployment of e-learning in Middle Eastern countries?"

4.7. Approaches for Qualitative Analysis

There are five different approaches for analyzing qualitative data: quasi-statistical, content analysis, thematic coding, analytical induction, and Grounded Theory approach. Each of these methods differs in the way of treating qualitative data and how to code and categorize it. These methods were reviewed to identify which of them would be appropriate for this research.

Firstly, Robson (2011) said that "the quasi-statistical approaches use word or phrase frequencies and inter-correlations as key methods of determining the relative importance of terms and concepts" (Robson, 2011, p. 467). Secondly, the content analysis approach depends on the following steps: create a research question based on presented theory, select a set of texts to test the question or hypothesis, create a set of codes, apply the codes of the rest of the texts, and create a matrix from the text and codes (Bernerd and Ryan 2010). Thirdly, thematic coding analysis is regularly used in qualitative research and arises when all data are in. It is a procedure of segmentation, classification and re-linking of phases of the database prior to the final explanation (Grbich 2007). Fourthly, Merriam (2009) found that the analytic induction procedure begins deductively by creating a hypothesis about the phenomenon of interest. If an instance of the phenomenon fits the hypothesis, it stands: if a case does not fit the hypothesis, the hypothesis is modified. Finally, the Grounded Theory approach is "used to develop theory

grounded in the data. Codes are based on the researcher's interpretation of the meanings of patterns in the texts" (Robson 2011, p.467).

Next section explains why Grounded Theory is appropriate for this research.

4.8. Philosophy for Selecting Grounded Theory Approach

Considering these approaches in relation to the research nature, the quasi-statistical approach is neither a statistical nor narrative analysis; it depends on descriptive analysis instead of inferential analysis which is needed in this phase. Moreover, the quasi-statistical approach might decrease the strength of the data gathered through the in-depth interviews, as it largely depends on converting qualitative data into a quantitative format to enable statistical action.

In contrast, the content analysis approach might provide only a surface overview of an e-learning maturity model, and being thematic alone lacks the detailed numerical information to situate and structure the data. Also, it focuses on word counts, leaving the detailed interpretations, and it is very difficult to assess causal relationships (e.g. in relation to student's attitudes and e-learning deployment). Bernard and Ryan (2010) established whether the research task is exploratory or confirmatory, and that content analysis is usually quantitative analysis.

Thematic coding analysis is limited to exploration of the e-learning maturity model phenomenon with little attempt made at interpretation. Robson (2011) claimed that it is not unusual to find reports where it is claimed that thematic coding analysis has been carried out, and themes are discussed, but there is little or no information about the details of the procedure. It is also a generic approach which currently has less kudos as an analytic method. Moreover, the potential codes generated from this method are broad, which can be an obstacle to the researcher who is trying to decide what aspects of data to focus on.

In the same context, Johnson (2004) suggests that analytic induction follows a set of procedures, such as the following: formulate a definition of the phenomenon of interest, put forward an initial hypothetical explanation of this phenomenon, study a situation to determine whether or not the hypothesis fit, if the hypothesis doesn't fit the evidence then either the hypothesis must be reformulated or the phenomenon to be explained must be redefined , There is a dynamic interaction between data collection, data analysis and hypothesis formulation. This means that analytic induction may determine why students of certain characteristics or in certain circumstances have negative attitudes towards e-learning, but it doesn't allow us to say why those particular students have negative attitudes rather than others in the same situation with the same characteristics.

Depending on the preceding debates, the qualitative part of this research was guided by the Grounded Theory method, developed by Glaser and Strauss (1967) to generate theory of e-learning maturity model. Strauss and Corbin (1990 p.23) describe Grounded Theory as:

> *... one that is inductively derived from the study of the phenomenon it represents. That is, it is discovered and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon. Therefore the data collection, analysis, and theory stand in reciprocal relationship with each other. One does not begin with a theory and then prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge. (p. 23)*

Moreover, Bryman (2008) sees that Grounded Theory has become by far the most widely used structure for study qualitative data. Similarly, Hennink et al. (2011) reported that Grounded Theory is the outstanding approach to qualitative data collection and analysis in the social sciences. It was developed by two American sociologists, Barney Glaser and Anslem (Strauss 1967; Glaser 1978) and its subsequent variations (Strauss and Corbin 1990, 1998; Charmaz 2006) have remained influential in leading qualitative researchers throughout the world. Furthermore, they reported that Grounded Theory is clearly connected with the interpretive paradigm; it subtly merges characteristics of two, traditionally contrasting, epistemological approaches, perhaps adding to its strength and appeal. This is supported by Liamputtong and Ezzay (2005) who say that Grounded Theory is not a theory itself, rather it is a method for developing empirical theory from qualitative research that consist of a set of tasks and underlying principles. They found that Grounded Theory, therefore, supplies an approach through which "theory can be built up through careful observation of the social world"

Also, Charmaz (2000) articulates why Glaser and Strauss's book was so "revolutionary":

because it challenged (a) arbitrary divisions between theory and research, (b) views of qualitative research as primarily a precursor to more "rigorous" quantitative methods, (c) claims that the quest for rigor made qualitative research illegitimate, (d) beliefs that qualitative methods are impressionistic and unsystematic, (e) separation of data collection and analysis, and (f) assumptions that qualitative research could produce only descriptive case studies rather than theory development.

The next part explains why Grounded Theory is appropriate for this phase.

4.9. Underlying Principles of Grounded Theory

Most literature resources discussing the underlying principles of Grounded Theory (e.g. Dey 1993; Rubin and Rubin 2005; Charmaz 2006) suggested that influence of the analysis of qualitative data includes the following: a) data analysis is a circular process, not a linear order, thus analytical activities are conducted is circular way, whereby tasks may be repeated, overlapped or conducted simultaneously, enabling this research to go deeper into the data; b) verbatim transcripts are used in analysis which allows researchers to recognize the views of study participants in their own words, and understand their meanings and from conclusions that

are well rooted in the data; c) data collection and analysis are connected and some analytic tasks begin during data collection; d) analytic concepts are assembled inductively from data, not from deductive theories; e) constant comparison is used during the analysis to define and refine concepts; f) memo writing during the research supplies transparency of the research procedure and a pursue of analytical decisions; and g) data analysis includes description and goes further to develop the framework and theory for an e-learning maturity model.

Furthermore, what distinguishes Grounded Theory from other types of qualitative research is its focus on building theory (Corbin and Strauss 2007). Merriam (2009) reports that the form of theory extended is usually substantive instead of formal or grand theory. She also found that a Grounded Theory analysis looks not just to know, but also to construct a substantive theory about the phenomenon of interest. Thus, a substantive theory has usefulness to practice which is often lacking in e-learning theories that cover other universities concerns. In the same context, Grounded Theory is particularly useful for addressing questions about process: i.e. how e-learning maturity model changes over time.

Therefore, Glaser and Strauss (1976), Glaser (1978), Strauss and Corbin (1990, 1997, 1998), Corbion and Strauss (2008) and Charmaz (2006) have identified the process of Grounded Theory analysis in the following tasks:(1)prepare the research question; (2) prepare a theoretical sample; (3) collect data; (4) define codes; (5) code data; (6) constant comparison; (7) categories; (8) explore any relations between categories; (9) conceptualize; and (10) develop the theory. The preparations for some of these tasks helped in the process of analyzing the data collected through the in-depth interview, which helped to develop a coding scheme for the in-depth interview data, as well as evaluating the in-depth interview structure and implementation process.

In order to meet the aim of this study, which challenged: (a) discovering theory about e-learning maturity model and its deployment; (b) the high weight in this research in first qualitative phase; (c) the second quantitative phase in this research will be used to validate the first qualitative phase; (d) beliefs that qualitative methods are vague and disorganized will be removed; (e) through in-depth interviews there is no separation of data collection and analysis; and (f) the outcome from form first qualitative phase will be as e-learning theory development. Thus, this research will depend on Grounded Theory for analyzing qualitative data.

Moreover, in taking account of the nature of the research and samples used, Grounded Theory will provide an adequate coding process derived from the data itself and also keep bias to a minimum. It will allow in depth interpretation of data, as it is not simply looking for frequencies of words or phrases. The data collected through the in-depth interview study indicated common themes and patterns in students' responses regarding the questions topics. This helped in constructing a coding scheme which was used to organize and classify the data collected in the research. Furthermore, Grounded Theory provides a research methodology that is creative, dynamic and flexible, yet rigorous within a set of procedures. It is especially useful for

developing theories where little is known about the phenomenon. Hence, it was proper for this study because there has been little exploration of the e-learning maturity model. Finally, as the subject area of that e-learning is in its infancy, at the present time little theory exists that may be tested. The Grounded Theory approach, therefore, helped identify a number of themes that emerged from the study. This approach to data analysis was undertaken with the assistance of a MaxQDA program.

The Grounded Theory procedures followed and the way in which the software was utilized are closely entwined and are appropriately discussed together in the next section.

4.10. Using CAQDAS to Aid Grounded Theory

Computer Assisted Qualitative Data Analysis Software (CAQDAS) is the expression commonly used for computer programmes that assist qualitative data analysis. Software programmes for the analysis of qualitative data help the researcher to code segments of text, store the segments together, and retrieve and display them for further analysis (Miles and Huberman 1994). The capabilities of CAQDAS packages differ from straightforward code-and-retrieve techniques to software that supports the writing of contextual memos and aids concept building (Richards and Richards 1998). CAQDAS programmes supply researchers with an alternative to the conventional methods of using highlighters, scissors, glue and index cards to sort and analyze data (Tesch 1990). The software assists these processes by helping to categorize the data; it does not, however, analyze the data for the researcher (Fielding 1994). Therefore, CAQDAS differs from quantitative analysis programmes such as Minitab that perform the actual analysis, i.e. the calculation of the statistics. In using CAQDAS the researcher still has to do the thinking.

4.11. Rationale for Selecting MAXQDA

A range of Computer Assisted Qualitative Data Analysis Software (CAQDAS) programmes are available, and examples include: AnSWR, ATLAS, HyperRESEARCH, QSR NVivo, and Maxqda. MAXQDA was selected for use in this study. This research will provide descriptive narrative to facilitate an understanding of the investigation. However, it also wants to segment the data according to the research questions, whilst at the same time identifying emerging themes across the data. MAXQDA supports category construction, an approach that can be applied whether working 'down' from theory or 'up' from the data, as in the Grounded Theory approach taken here. Therefore MAXQDA met the methodological stance taken in this study.

An important aspect of MAXQDA is that it supports qualitative data analysis with the unique Visual Tools. This feature addresses problems experienced with other CAQDAS software; for example, NVivo where visual tools are modelling relationships.

For example, the Text Portrait displays any text as a painting of either all or specific, selected codes assigned throughout this text. Different colours were assigned for codes to assist in

analysis, e.g. a special colour for behaviour factors (red) or opinion factors (green).With one look at a Text Portrait you will be able to enlighten which factors played a significant role. Also, these colours could be modified at any time, throughout analytical procedures, simply with a few clicks.

Furthermore, MAXMaps is component of all MAXQDA. This component presents an innovation perspective on data and its inherent relationships. Its main function is to give a graphic demonstration of the various elements of a MAXQDA project. These items can be embedded into the MAXMaps drawing pad and relations can be made in order to visualize a difficult network graph. MAXMaps also supports the drawing of charts or networks that are totally independent of MAXQDA's data. The entire elements of MAXQDA (codes, memos, coded segments and documents) may be introduced into a chart. Also, MAXMaps allows the insertion of what are called free objects (text, pictures and graphics).

Lastly, MAXMaps can be used in this study for various reasons. Maps can assist exploring and categorizing data. They permit the expansion of ideas and their communication within a research team. Maps can also be an important tool for scientific investigation and can help to imagine complex relationships and theories.

Then next section describes the procedures for collecting qualitative data.

4.12. Collecting Qualitative Data and Coding

The research conducted 150 in-depth interviews with 75 students and 75 staff from six different universities across Egypt, Bahrain and Oman. The in-depth interviews contained questions about the e-learning dimensions investigated in this research.

The search for theory begins with the very first line of the very first in-depth interview. This process begins with a small chunk of text and code line- by- line, then identifies the potentially useful concepts and names the concepts. We then move on to another chunk and do this again and again. This is what Strauss and Corbin (1998) call open coding and Charmaz (2002) calls initial coding. The next step involves more theorizing, pulling examples of all concepts together and thinking about how each concept might be related to larger, more inclusive concepts. That has been called categories in the language of Grounded Theory, and involves the constant comparative method (Glaser and Strauss 1967; Strauss and Corbin 1998) going on throughout the Grounded Theory process, right through the development of complete theories. Coding for categories is variously called focused coding (Charmaz 2002) or theoretical coding or axial coding (Strauss and Corbin 1998). This research used this method to study 150 respondents -75 students and 75 staff - who had have experience with e-learning. The goal was to explore dimensions of an e-learning maturity model. Table 4.3 summarizes the method used to develop a code which was used to refer to the in-depth interviewees.

Category	Subcategory	Code
Government University in Egypt		GU\EG
Private University in Egypt		PU\EG
Government University in Bahrain		GU\BH
Private University in Bahrain		PU\BH
Government University in Oman		GU\OM
Private University in Oman		PU\OM
Student		S
Lecturer		L
Students' Attitudes		SA
	Opinion	SA\Opi
	Feeling	SA\Fee
	Behaviour	SA\ Beh
E-learning Features		ELF
	Lecture Slides	ELF\LS
	Assignment Components	ELF\AC
	Previous Exams	ELF\PE
	Online Exams	ELF\OE
	Calendar	ELF\C
	Communication Components	ELF\CC
	Grade Center	ELF\GC
	Online Attendance	ELF\OA
	Resources	ELF\R
Effects of E-learning on Students		ELE\
	Communication Gains	ELE\Com
	Education Gains	ELE\Edu
	Organization Gains	ELE\Org
E-learning Implementation		ELMo
	Behaviourism	ELMo \Beh
	Constructivism	ELMo \Con
	Cognitivism	ELMo \Cog
Lecturer Attitude		LA
	Opinion	LA\ Opi
	Feeling	LA\ Fee
	Behaviour	LA\ Beh
E-learning strategies		Str
	Learning	Str\L
	Development	Str\D
	Support	Str\S
	Evaluation	Str\E
	Organization	Str\O
Serial No.	1-50 Egypt	1-25 Lecturers 26-50 Students
	51-100 Bahrain	51-75 Lectures 76-100 Students
	62-72 Oman	101-125 Lectures 126-150 Students

Table 4.3 In-depth interview participants' codes summary

As seen in Table 4.3, the in-depth interview sample participants were coded according to university, lecturer or student, student's attitudes (behaviour, opinion or feeling), e-learning

features, effects of e-learning (communication, education or organization), which model of e-learning (cognitivism, constructivism or behaviourism), lecturer's attitudes (behaviour, opinion or feeling) and e-learning strategies.

The next section explains process analysis in the qualitative phase.

4.13. The Main Themes in the In-depth Interviews of Students and Academics

The analysis for the qualitative phase served to answer the research question concerning the dimensions of e-learning maturity model. Using Glaser and Strauss's (1967) method of constant comparison and Miles and Huberman's (1994) suggestions for coding qualitative data, all processes that the participants explained or referred to in the in-depth interviews were identified and categorized with regard to their attempts to learn about and fit into the e-learning. This process was carried out in several iterations as follows:

Firstly, the transcriptions were read to obtain an overall flavor of the interviewees' responses. Next to each line or paragraph, labels were created to reproduce our initial coding. Depending on these labels, a general category scheme for the participant responses for e-learning maturity model was created.

Secondly, the themes were identified by organizing the preliminary scheme into concrete categories and subcategories. The categorization reflected similarity (in regard to the maturity model) and frequency of responses. A significant portion of the participants had to identify an initial theme for it to be included. Next, the transcripts were revised and checked for frequently occurring words and unexpected counter-intuitive material that provided atypical evidence of student and staff experiences. The responses were categorized according to several initial themes, such as socio-technical factors, educational factors, strategies, e-learning models, and technological infrastructure factors.

Thirdly, these themes were reviewed to determine how they fit into the existing theory of the e-learning maturity model or how they might contribute to an understanding of the e-learning maturity model. As a result, the initial themes were combined and renamed into six dimensions of e-learning in the Middle East. Finally, the analysis determined six dimensions which sufficiently reflected the responses provided by students and staff.

The next section reviews the results of in-depth interviews with staff and students. Moreover, it will summarize the current situation of using the e-learning technologies in Egypt, Bahrain and Oman.

4.14. Constructing Grounded Theory for the E-learning Maturity Model

Following the Grounded Theory procedure, open, axial, and selective coding were conducted with the set of 150 transcribed in-depth interviews (Glaser & Strauss, 1967; Strauss & Corbin, 1998). During the open coding process, the analysis begins with a small chunk of text and code line- by- line. Identify potentially useful concepts and move on to another chunk and do this again. Through this process, data were fragmented into conceptual components. During all of the coding stages, the process analysis utilized the constant comparative method described by Glaser and Strauss (1967).

For example, one of the larger axial category "students' attitudes", began as the individual open codes of "behaviours", "feelings concerns" and "students' opinions". Behaviours concerns were coded when the students discussed that they used e-learning for downloading materials, submitting assignments and communicating with teachers. Feelings concerns were coded when the students discussed that they felt unprepared for university e-learning work, e-learning strategies, and university attitudes. Opinions were discussed by several students who have views about university later on during their e-learning, and who had struggled to adjust to the transition needed for this learning style. Process analysis examined the open codes, and these three codes as represented a larger conceptual category, named "students' attitudes". Following this, the researcher, went back through all of the transcripts to record all of the instances of students' feelings, opinions and behaviours, to develop the properties and dimensions of the category more completely.

All of the open codes were then examined to determine whether individual codes could be combined into higher conceptual categories as a part of the axial coding process. Once these higher conceptual categories were developed, the process analysis examined each category's properties and dimensions. During axial coding, connections were made between the categories and their sub-categories through the process of considering the conditions, context, action and interaction processes, and the consequences of each category. Through the process of selective coding, the axial categories were then analyzed to investigate their relationships to each other across the participants' interviews. As a result of that, the attitude factor formed depending on the participants' perspectives included the following categories: behaviours, feelings and opinions of students and academics.

Moreover, the axial categories included the environments that impacted the participants' attitudes, and the action and interaction processes resulted from e-learning. The action and interaction processes included e-leaning features, effects, implementation and strategies. All three coding phases helped this research to develop the Grounded Theory concerning the e-learning maturity model for Middle Eastern universities.

After collecting and analyzing the 150 in-depth interviews, theoretical saturation had been achieved. Six axial categories were developed from the data analysis, and two larger selective categories were developed to connect the axial categories. The larger selective categories

included vision of e-learning and the consequences of this vision. The Grounded Theory concerning the maturity model for e-learning is shaped by describing the relationship between vision of the e-learning and the consequences of this vision.

Finally, the in-depth interviews were analyzed by utilizing the Grounded Theory procedures of open, axial, and selective coding (Strauss & Corbin, 1998). The six axial categories are presented, as they represent the conditions that precipitated the participants' perspectives, or e-learning approach, that eventually led to the consequence of shaping the maturity model for e-learning (See Table 4.4). The axial categories were represented in each of the participants' in-depth interviews in the following table.

The absence of the e-learning vision represented in the following categories:	Consequences of the absence vision represented in the following categories:
E-learning strategies • Learning • Development • Support • Evaluation • Organization	**Students' attitudes** • Opinion • Feeling • Behaviour
E-learning Models • Behaviourism • Constructivism • Cognitivism	**Lecturers' attitudes** • Opinion • Feeling • Behaviour
E-learning Features • Lecture Slides • Assignment Components • Previous Exams • Online Exams • Calendar • Communication Components • Grade Center • Online Attendance • Resources	**Effects of e-learning** • Communication Gains • Education Gains • Organization Gains

Table 4.4 Axial Categories from Participant Interviews

The categories are described within the next section. Also, selected in-depth interview excerpts are presented to represent each category.

4.15. Students' In-depth Interviews Results

The research conducted 75 in-depth interviews with students. The in-depth interviews contained questions about the dimensions of the e-learning maturity model which were investigated in this research. All the participants thought that the maturity model for e-learning was an interesting experience for them; however, they had mixed attitudes to this new mode of learning. They pointed out some new dimensions of e-learning and also expressed some concerns. Interestingly, all female and male participants in this study preferred a mixed class,

meeting half in class and half online. Nobody seemed to enjoy taking a class that was fully online.

The next section of the study explores what students' experience about the maturity model in detail.

4.15.1. Students' Attitudes towards E-learning

This dimension included behaviours, opinions and feelings towards e-learning. Also, it expressed general e-learning features: exploring how to interact with e-learning, speaking up at forums, demonstrating a willingness to interact with lecturers, deriving university support, and generally feeling of the usefulness of e-learning (Appendix H).

Student's attitudes towards e-learning may not be as positive as expected and it is widely recognized that e-learning should not be used for the sake of using e-learning. That supports the findings of Cotterill et al. (2005) who carried out a similar study to explore students' attitudes towards e-learning. Contrary to expectations, limited evidence in support of the use of e-learning was found in the current phase. Specifically, findings suggest that the e-learning was rarely used by students and was rated by a significant number of students as not valuable. This is surprising, given that the e-learning appears to be one of the methods that students are most likely to use in order to maximize the potential benefit of learning. This impression is reinforced by the claims that e-learning facilitates learning (Hartford 2005) and helps address the challenges in traditional learning (Hobbs 2002).

Several conditions began to set the stage for negative attitudes for the participants. Some of the conditions began even before the participants used e-learning. The explanation for the rather unexpected findings from the current phase could be that students thought that e-learning means downloading course material as an electronic version, rather than an integrated new theory for learning. Another plausible explanation is that the syllabus was designed with limited scope for traditional learning. It could perhaps be argued that if the syllabus was based on collaborative learning, there would have been a relatively high usage of e-learning.

As a result of this phase, the regularity of usage of Blackboard was also medium among the students, with the majority using it frequently to enhance face-to-face teaching. Plausible explanations for the varied views held by the respondents and the varied usage between high and low include: students have no books (Government university Oman- high usage); students just want to pass in final exam (Private university Oman- low usage); nothing new gained from BlackBoard (Government university Bahrain- low usage); students don't need extra data (Private university Bahrain-low usage); there is no infrastructure for e-learning (Government university Egypt- no usage); and students want the main information to pass in final exam(Private university Egypt- low usage). Moreover, the usage depends on receiving appropriate technical support from the department's e-learning officer which rarely happens in Government universities in Egypt and Bahrain.

Also, there was overwhelming agreement between both faculty and student respondents that e-learning is a beneficial educational tool, and very substantial agreement that course contents specifically is a valuable educational tool which improves student learning but there is a big difference between words and deeds. Conversely, both students and faculty respondents

considered that there is no relation between their own computer literacy and their skills to utilize the e-learning features.

Another significant agreement between faculty and students' opinions was that e-learning does not facilitate student-to-student communication. This is understandable given that students often use personal email accounts (Hotmail, Yahoo, etc.). In the same context, an extra interesting finding of the study is that a vast majority of the students was of the opinions that the communication tools were not beneficial to them. So, this important interactive tool between the instructors and students needs to be made more closely related to course contents so as to help them attain the collaboration learning. From a different viewpoint, the findings show that the graphics and animations haven't been included in course materials. Perhaps these components would have received a more positive evaluation if they were deployed more fruitfully to convey the course contents in a clear way.

No significant relationship was found between demographic factors (gender, age, own PC) and perceived usability of Blackboard. These outcomes are in contrast to those of many present studies (Keller and Cernerud 2002; Reid 1999; Selwyn 2008). A plausible explanation of the non-significant correlation between demographic factors and the opinion of the usability of Blackboard found in the current research is that the students (irrespective of gender and other demographic factors) may have been fully trained to computers and Blackboard, particularly since the study was conducted about two years after their studies began. Thus, it can be argued that, given equal access and technical support, students are likely to have a very optimistic perception of e-learning irrespective of gender and age.

The worst case was found In Egypt, where a significant segment of the students admitted that their problems related to institution issues which were not sorted out immediately. This needs to be addressed by the authorities concerned as these kinds of minor problems might result in low motivation among the students. Thus, solving their legitimate problems without delay would help bring in more students to the e-learning. Also, the majority of students in public universities said they believed that the community is not ready to accept the idea of learning via a computer screen. Rather, they are used to studying from books and attending lectures physically in classrooms. They think that e-learning is currently too advanced for the student. They see it as a valuable tool but not yet for Egypt especially in government universities. On 21st May 2012, in front of the Egyptian parliament, hundreds of faculty members of Egyptian universities demonstrated, carrying a black coffin pronouncing the "survival of the God in Egyptian education" and other signs indicating a low level of education in Egypt.

Comments illustrating the latter view are as follows:

In Egypt, some students believed that e-learning are not available in Egypt. Moreover, students were asked about their evaluation of the technological infrastructure available at their government universities. Nearly all students (90%) think the technological infrastructure at Egyptian universities is very poor and needs a lot of improvement. According to them, a

significant proportion of the computer units available in university are not working or out of date.

One interviewee said that:

"…I think in my faculty, nothing about e-learning because of various reasons like cost, perception of its importance or even unawareness…"

(GU\EG\ S\26\ SA\Opi\ Str\S\LA)

Another interviewee said:

"... There is nothing in my study that requires me to use the e-learning or internet; I usually memorize the content of the subjects' books or notes..."

(GU\EG\ S\26\ SA\Opi\SA\ Beh\ Str\L)

Some of them said:

"...I don't think I can study through e-learning, we are not used to study like this and the idea in the final exam will be from the book..."

(GU\EG\ S\27\SA\Fee\ SA\Opi\ Str\L)

"…I use the internet regularly, but mostly in chatting and emails with my friends but I haven't Blackboard or e-learning like European universities…"

(GU\EG\ S\28\SA\Beh\ SA\Opi\ Str\S)

"... This method of learning is not suitable in Egypt because we haven't technical support team for this technology... "

(GU\EG\ S\29\ SA\Opi\ SA\Fee\ Str\D \Str\S\ Str\E)

"...It is not easy to simply engage in e-learning, it needs lot money to prepare the infrastructure and to train student to use technology…"

(GU\EG\ S\30\ SA\Opi\ SA\Fee\ Str\O\ Str\S)

There are similarities between private universities in Egypt and government universities in Oman and Bahrain. This similarity extracted from the following respondents.

Many respondents said:

"... I use the e-learning regularly, but mostly in downloading materials, assignments and course information..."

(PU\EG\ S\31\SA\Beh\ELF\LS\AC\ Str\S)

(GU\BH\S\76\SA\Beh\ ELF\LS\AC\ Str\L)

(GU\OM\S\126\SA\ Beh\ ELF\LS\AC\ Str\D)

There are similarities between private universities in Bahrain and Oman. This similarity extracted from the following respondents:

Most of students especially in private universities admit that they don't care about e-learning because their lecturers give them revision before final exams, these revisions sessions include all important parts.

"... I don't care about e-learning; my lecturer gives us revision for final exam..."

(PU\BH\S\77\SA\Beh\ SA\Opi\ Str\L)

(PU\OM\S\127\SA\Beh\SA\Opi\ Str\L)

Figure 4.3 shows the graphic model that MaxQda produced to represent students' attitudes towards e-learning. Notice how each of the axial codes in this model is succinctly defined by a quote from a respondent.

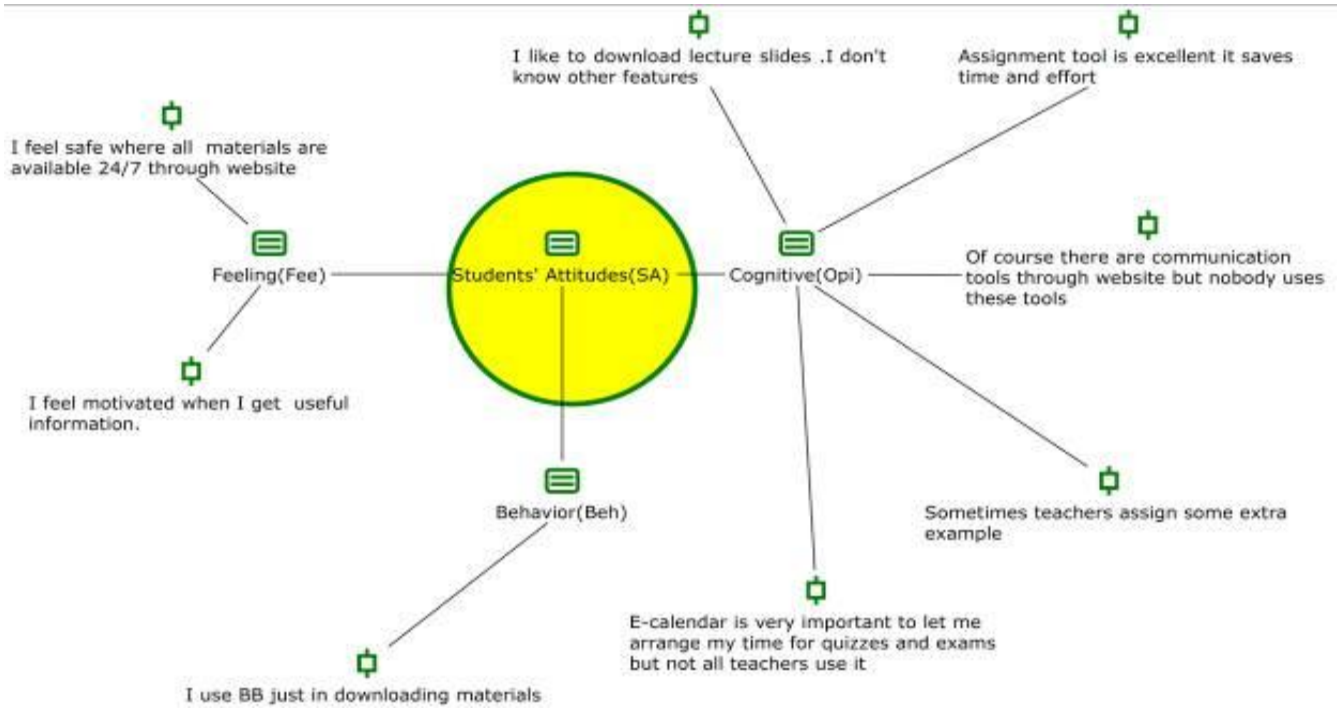


Figure 4.3 Diagram for Students' Attitudes towards E-learning Experience.

Lastly, the research study has generated a number of outcomes of the first research question, *What are the criteria affecting the introduction of the maturity model in the deployment of e-learning in Middle Easernt countries?* Based on the findings of a group of students' in-depth interviews, one of the most important results is that opinion, behaviour, and feeling are distinguishable, yet interrelated, components of attitude. This supports the findings of Breckler (1984) and Jones and Clarke (1994) who carried out a similar study to explore attitudes. Furthermore, students' attitudes in this research worked as an indicator of success or failure for e-learning models, strategies and features.

4.15.2. Effects of E-learning on Students

Effects of e-learning on students was the second dimension of the e-learning maturity model. In fact, it is necessary to take a broad perspectives in order to understand and determine how e-learning impacts on students. This is because the potential attainments of e-learning are shaped not only by the technology infrastructure but also by the socio-economic background of the students, their socio-cultural environments, the changing skills and competences that are necessary for employment, education and training, self-development and participation in society. This partly clarifies how successful deployment for e-learning models has been identified in the Middle East.

Several reasons have set the stage for knowing why a negative outcome for the participants. A significant portion of students make it clear that e-learning system can be explained using the following criteria: enroll in a course of study; access course materials prior to lectures; receive notification of changes or cancellation of classes and check marks and grades. Contrary to expectations, findings suggest that the e-learning was rarely used by students in the following fields: ask questions online rather than waiting for a face-to-face class; compare their own understanding to that of other students through the discussion board; locate other learning resources via links provided and test out their knowledge and receive feedback using the self-assessments.

Interviewees described aspects of e-learning through the norms of the university and "how things get done". Students, who learn in the Middle East, talked about steps their university takes to support e-learning. They said that their university's culture is not conducive to an overly e-learning maturity process.

These findings compliment earlier studies such as Ituma (2011) when she said "usage of e-learning components is still skewed towards the traditional mode of learning which emphasizes limited involvement of students in the learning process that was clear in high usage of course content as opposed to chat and discussion." Also, these findings are in line with Davies and Graff (2005) when they said, "it may be concluded then that the reported beneficial effects of online participation and interaction do not necessarily translate into higher grades at the end of the year, with students who participated more frequently not being significantly awarded with higher

grades. However, students who failed in one or more modules did interact less frequently than students who achieved passing grades."

Comments illustrating the latter view are as follows:

"…E-learning is a good way of exchanging knowledge and interaction between lecturers, teachers and students, through the computer and through the internet if it is implemented with right way..."

(PU\EG\ S\50\ ELE\Com\ ELE\Edu)

(GU\OM\ S\150\ ELE\Com\ ELE\Edu)

(GU\BH\ S\100\ ELE\Com\ ELE\Edu)

(PU\BH\ S\90\ ELE\Com\ ELE\Edu)

(PU\OM\ S\129\ ELE\Com\ ELE\Edu)

"…I do not necessarily see the advantages of a discussion forum, e-calendar, e-board, other resources and chat. I suppose the problem with this is that the module was designed with limited scope for group work activities…"

(PU\EG\ S\35\ ELE\Com\ ELF\CC\ELF\C\R\ Str\L \ SA\Opi)

(GU\OM\ S\144\ELE\Com\ ELF\CC\ELF\C\ R\ Str\S \ SA\Opi)

(GU\BH\ S\95\ELE\Com\ ELF\CC\ ELF\C\R\ Str\O \ SA\Opi)

(PU\BH\ S\88\ELE\Com\ ELF\CC\ ELF\C\R\ Str\E \ SA\Opi)

(PU\OM\ S\140\ELE\Com\ ELF\CC\ ELF\C\R\ Str\D \ SA\Opi)

"… Downloading course contents, uploading assignments, online attendance, previous exams and grade centre are the most important components…. "

(PU\EG\ S\32\ ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

(GU\OM\ S\137\ ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

(GU\BH\ S\97\ ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

(PU\BH\ S\94\ ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

(PU\OM\ S\133\ ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

"…An online exam is excellent tool for students who don't want to cheat but it needs good infrastructure…"

(PU\EG\ S\40\ ELE\Edu\ ELF\OE\ SA\Opi)

(GU\OM\ S\128 \ ELE\Edu\ ELF\OE\ SA\Opi)

(GU\BH\ S\135\ ELE\Edu\ ELF\OE\ SA\Opi)

(PU\BH\ S\95\ ELE\Edu\ ELF\OE\ SA\Opi)

(PU\OM\ S\132\ ELE\Edu\ ELF\OE\ SA\Opi)

Figure 4.4 shows the graphic model that MaxQda produced to represent e-learning effects. Notice how each of the axial codes in this model is succinctly defined by a quote from a respondent.

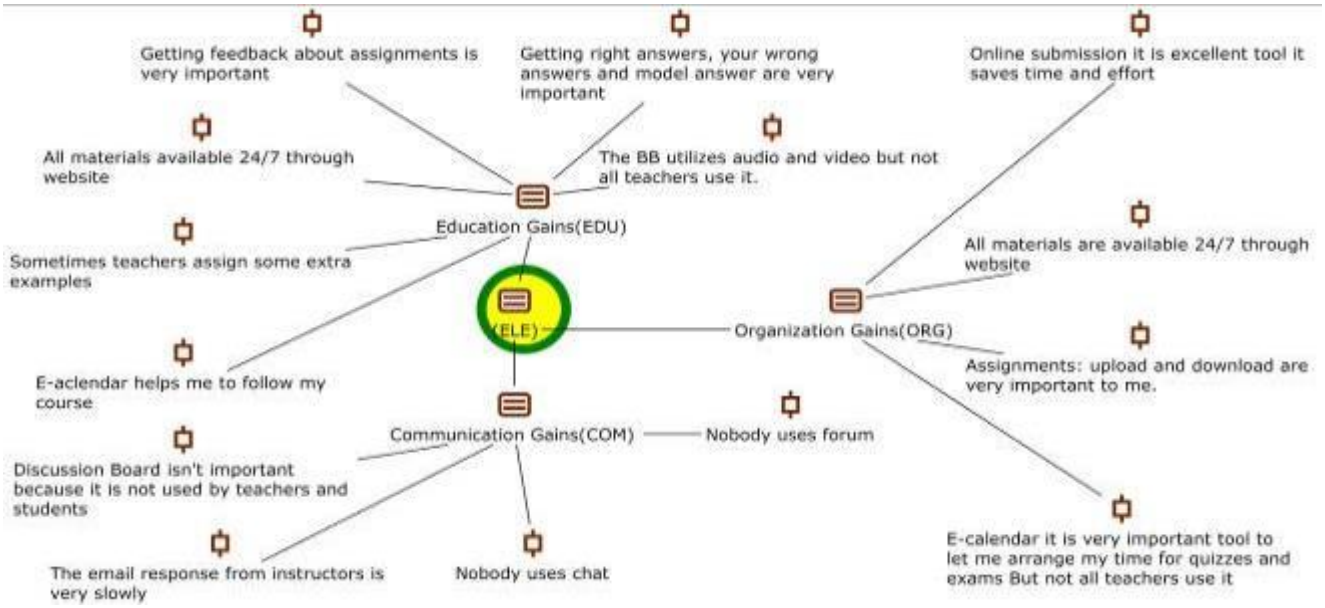


Figure 4.4 Diagram for Effects of E-learning.

The in-depth interviews provided evidence that use of e-learning makes it possible for many students to:

- enroll in a course of study regardless of geographic location;
- access course materials prior to lectures;
- receive notification of changes or cancellation of classes;
- receive updates on administrative and learning issues within face-to-face classes;
- check marks and grades.

In the same context, the in-depth interviews also provided evidence that students do not use e-leaning in the following cases:

- get to know fellow students via the discussion board;
- ask questions online that they didn't feel comfortable asking in a face-to-face situation;
- ask questions when they arose rather than waiting for a face-to-face class;
- compare their own understanding to that of other students through the discussion board;
- track the development of ideas through the discussion board;
- locate other learning resources via links provided;
- test out their knowledge and receive feedback using the quiz facility.

The preceding results and comments suggest that students might be affected by the unclear perception, vision and strategy of e-learning that currently exists in the Middle East , as there is no clear model or strategy for e-learning and what it does, which might result in a mistrust of the system and its output. Also, findings suggest that usage of e-learning components is still skewed towards the traditional mode of learning which emphasizes limited involvement of students in the learning process. That supports the findings of Ituma (2011) who carried out a similar study to evaluate students' perceptions.

4.15.3. E-learning Model

This phase explores the implications of what is commonly known as learning theories which have been embedded in e-learning. Implementing e-learning can be seen as a difficult process going beyond methodically implementing steps within an instructional design model. Within the e-learning situation, Atkins (1993) explained that there are three learning theories (Behaviourism, Cognitivism, and Constructivism) which could be used in the implementation process.

The next section explores what are learning theories that have been adopted in the applications of e-learning at Middle Eastern universities?

Behaviourism

Atkins (1993) identified that there are many features relevant to the development of e-learning courses with respect to the behaviourist theory:

The course material should be divided into small instructional phases being explained in a deductive way by means of starting with an introduction, category, principle, formula or definition, giving positive cases to enhance understanding, and showing negative cases to establish theoretical boundaries. In addition, syllabus designers have to define sequences of instructions using branching to other instructional units and pre-determining choices within the course.

In the same context, he explained that the activities or assignments should be sequenced for increasing difficulty or complexity. To increase learning effectiveness, learners may be routed to repeat certain parts based on the performance on analytical exams, or on exams within the sequence of learning activities.

Similarly, Modritscher (2006) and Ally (2004) explained that the behaviourism theory for learning proposes to express the required procedure, step or skill, and to break it down into its elements with suitable demonstration before students or learners are expected to learn the preferred behaviour. Moreover, they found students are supposed to construct experience from loop check or revise with check-up exams at important points or repeat practice with feedback message. However, the instructional designer may also allow a learner to choose the next instruction from a set of activities, giving the learner more power over the learning process.

The aim of behaviourist concepts focuses on a structured, deductive approach to design an online course, so that basic concepts, skills, and factual information can rapidly be acquired by the learners. Further implications on online learning can be summarized by the concept of drill and practice, arranging materials and assessing learner's achievement levels, and giving external feedback. However, the usefulness of behavioural design concepts for learning or for transfer of learning is as yet unconfirmed.

The results of the qualitative data analysis demonstrate that there is no relationship between the behaviourist concepts and e-learning at the Middle Eastern universities that is caused by insufficient awareness. It makes clear and uniquely identifies the low level of e-learning awareness in the Middle Eastern universities as the major factor affecting its acceptance.

Comments illustrating the latter view are as follows:

"…There isn't a step-by-step description of learning materials… "

(PU\EG\ S\33\ELMo\Beh\SA\Opi\ Str\S)

(GU\OM\ S\131\ELMo\ Beh \SA\Opi\ Str\D)

(GU\BH\ S\93\ELMo\ Beh \SA\Opi\ \ Str\O)

(PU\BH\ S\87\ELMo\ Beh \SA\Opi\ Str\L)

(PU\OM\ S\136\ELMo\ Beh \SA\Opi\ Str\E)

In-depth interview data analysis shows that more than half of the students interviewed (57%) do not have self-assessment questions as interactive activities in the learning materials. Some interviewee s said:

"…I have not self-assessment in the learning materials…."

(PU\EG\ S\34\ELMo\Beh\SA\Opi\ Str\S)

(GU\OM\ S\141\ELMo\ Beh \SA\Opi\ Str\E)

(GU\BH\ S\91\ELMo\ Beh \SA\Opi\ \ Str\L)

(PU\BH\ S\98\ELMo\ Beh \SA\Opi\ Str\D)

(PU\OM\ S\141\ELMo\ Beh \SA\Opi\ Str\O)

The research results obtained regarding the behaviourism factor suggest that there is a need for demonstrating the necessary process, task or skill, and to divide it down into its parts with suitable explanation before students are expected to copy the preferred behaviour. In addition, students are supposed to build skills from frequent review with check assessments at tactical points or repeat practice with response. It is essential for e-learning success to have an adequate model, as it represents the backbone of the system. Without it, e-learning will not be electronic learning; instead it will be some other form of learning.

Cognitivism

Cognitivism assumes that learning occurs within the learner, at a cognitive level, which may or may not involve behaviour (Modritscher 2006). In the same context, cognitivists see learning as an internal process that involves memory, thinking, reflection, abstraction and motivation (Ally 2004). Also, cognitivist view learning from an information processing point of view (Anderson 1985). This approach is best represented by an input-process -output model (Vrasidas 2000).

Hung(2001), Ally (2004), Kolb (1984), Myers (1978), Witkin et al. (1977), Deubel (2003), Duffy & Cunningham (1996), Paivio (1991), Keller & Suzuki (1988) and Meyer (1998) have identified that there are many features relevant for developing e-learning courses with respect to the cognitivism theory:

- Ally (2004) reports that e-learning materials should include tasks and assignments for the different learning and cognitive styles. Furthermore, it is necessary to supply adequate instructions for learning, peer-assessment of learning, information seeking through search engines, and use of note-taking and annotation;
- In this model, Vrasidas (2000) found educators set the objectives of the learning process, and the learners are expected to achieve these objectives. During the input process, the educator breaks the content to smaller pieces, steps, and designs in advance, which is a device used to perform more efficiently each step. In the output process, the educator evaluates the learner to see whether or not they have achieved the learning objectives;
- Also, Hung (2001) found that the teaching strategy should improve the learning method by providing all sensors, focusing the learner's awareness by highlighting significant and serious information, reasoning each instruction, and matching the cognitive level of the learner;
- In the same context, Ausubel (1960), Ally (2004) and Modritscher (2006) stated that the instructional designer should join new information with existing information from long-term

memory using advanced organizers to activate existing cognitive structures or to incorporate the details of the lesson, providing conceptual models to allow the learner to get back existing intellectual models, using pre-instructional questions to set expectations and to motivate the learner's existing knowledge arrangement, and using test questions to activate the prerequisite knowledge structure required for new materials;

- Moreover, Modritscher (2006) explained that the learning content should be divided to avoid cognitive high load. Exceeding a number between five to nine objects to learn, linear, hierarchical, and spider-shaped information maps should be supplied;
- Ally (2004) found that the strategies requiring the learner to apply, examine, synthesize, and assess should be used to advance deep processing of information and higher-level learning;
- Also, he argues that the online learning materials should include procedures for the different learning and cognitive techniques. Furthermore, it is necessary to supply sufficient and appropriate type of support for students with different types of learners;
- With respect to dual-coding theory, Paivio (1991) stated that the information should be offered in different forms to consider individual differences in processing and to assist shift to long-term memory;
- On the other hand, students need to be motivated to learn by means of learning strategies addressing the intrinsic motivation (driven from within the learner) and the extrinsic motivation (instructor or performance driven). Therefore, methods such as Keller's ARCS model – the abbreviation for attention, relevance, confidence, and satisfaction (Keller & Suzuki 1988) – could be applied by the instructor;
- With respect to (Meyer 1998), the teaching strategy should impose learners to use their meta-cognitive skills by reflecting on what they learn, collaborating with other learners or checking their progress;
- Lastly, the teaching strategy should join learning content with different real-life situations, so that the learners can relate to their own experiences and, therefore, memorize things better. It is worth mentioning that a transfer to real-life cases could enhance the development of personal meaning and contextualization of the information.

The students were asked about the content that is currently available and how they evaluate its quality in terms of materials, structure, design and presentation. The majority of the interviewees, nearly (90%), evaluated the current e-content to be poor and very shallow, they even commented that it is ironic and reflects very poor preparation techniques. Moreover, most of the students commented that much of the materials presented to them were no more than PowerPoint presentations containing text and illustrative images. They emphasized the importance of the availability of e-learning materials that are developed especially for Middle Eastern students. Furthermore, students were asked about the availability of instructions for learning to learn, objectives of learning process and annotation and notes in course website. The majority of them (90%) said that most of the e-content they see or use is in foreign languages and developed outside the Middle East, They added that the lack of interactive activities content represents a barrier for them to engage in e-learning activities, such as self-assessment and the step-by-step description. Several comments were frequently received by a number of interviewees indicating that there is a lack of feedback which adds to the difficulty of their online learning engagement.

Comments illustrating the latter view are as follows:

"…No, I didn't found annotation or notes in course website…"

(PU\EG\ S\41\ELMo\Cog\SA\Opi\ Str\S)

(GU\OM\ S\142\ELMo\Cog\SA\Opi\ Str\D)

(GU\BH\ S\81\ELMo\Cog\SA\Opi\ Str\L)

(PU\BH\ S\96\ELMo\Cog\SA\Opi\ Str\E)

(PU\OM\ S\147\ELMo\Cog\SA\Opi\ Str\O)

To sum up this subsection, Modritscher (2006) suggests that cognitive psychology focuses on learners' receiving and processing of information to transfer it into long-term memory for storage. Based on an analysis of the cognitivist theory, instructional designers have to consider different phases, beginning with dividing the learning content into smaller elements and supporting different learning modes, up to higher concepts such as enthusiasm, cooperation or meta-cognition. Although the cognitive-focused approach is well appropriated for achieving higher-level objectives, a main disadvantage can be recognized, if a learner lacks relevant prerequisite knowledge.

Based on the previous debate, it is obvious that the awareness with cognitivist theory at Middle Eastern universities is significantly low and can be ignored.

Constructivism

Mcleod (2003), Duffy & Cunningham (1996), Boethel & Dimock (1999), Murphy & Cifuentes (2001), Hooper & Hannafin (1991) and Modritscher & Sindler (2005) have identified that there are many features relevant for developing e-learning courses with respect to the constructivism theory:

- Modritscher & Sindler (2005) stated that constructivist learning environments should provide numerous representations of reality and be an active process keeping learners active doing activities such as asking learners to apply information in practical situations, facilitating personal interpretation of learning content, discussing topics within a group, and the learner being subjected to different views.
- Moreover, Hooper & Hannafin (1991) noted that learning is the process of making meaning of the real world. This is done by including examples and using cases for theoretical information and within social contexts through collaboration between the learner and the educator, and learner with other learners to apply and personalize the learning content offered.
- Furthermore, Babiarz et al. (2003) stated that constructivism emphasizes the idea of "integrated curriculum" which stresses that the educator does not teach in the traditional sense of 'standing in front of a room' and delivering instructions. Rather, the suggestion is

that students study a subject in a variety of ways and become actively involved through manipulation or social interaction. The educator should encourage the students to engage in active dialogue and discover principles by and for themselves as a result. Working with other learners gives students real-life experience and allows them to use and improve their meta-cognitive skills, which means that collaborative and cooperative learning should be implemented to facilitate constructivist learning. For example, when assigning learners for a group work, membership should be based on the expertise level and learning style, so that team members can benefit from one another's strengths;

- Also, Hung(2001) and Noddings (1998) noted that in order for learners to construct their own knowledge, constructivist educators do not emphasize lecturing. Instead they encourage the active engagement of learners (students) to establish and pursue their own learning objectives and provide good interactive online instructions. Moreover, Ally (2004) noted that the students have to take the first step to learn and cooperate with other students and the instructor since the learning schedule is managed by students. In contrast to traditional constructivists approaches, self-learning is the best way to learn. Therefore, a learning process should be student-centred not teacher-centred. In the student-centred model, the role of the educator is to facilitate and motivate. This model rejects the behaviourist's basic assumption that argues that the educator (teaching) process is merely a simple process of knowledge transmission.
- Ally (2004) goes on to say that a constructivist educator creates a classroom environment and should focus on interactive learning activities to promote higher-level learning and social presence, as well as developing personal meaning that is open, challenging, questioning, flexible, and dynamic. In this manner, students are mandated to become critical thinkers and problem-solvers. Conversely, he noted that the learners should be given control of the learning process and acquiring knowledge in ways that make sense to them. Besides this, there should be a form of guided discovery where learners can make their decisions on learning goals and attempts to make sense of the world, which enable them to use it in a meaningful way throughout their life, but can also use some guidance from the instructor.

It is worth mentioning that a significant proportion of students in the Middle East stated that the self-assessments and step- by- step learning are not included in course materials.

Comments illustrating the latter view are as follows:

"…Sometime BB is a way to communicate between students and teachers …"
(PU\EG\ S\42\ELMo\Con\SA\Opi\ Str\L)
(GU\OM\ S\140 \ELMo\Con\SA\Opi\ Str\D)
(GU\BH\ S\82\ELMo\Con\SA\Opi\ Str\S)
(PU\BH\ S\92\ELMo\Con\SA\Opi\ Str\E)
(PU\OM\ S\145\ELMo\Con\SA\Opi\ Str\O)

Figure 4.5 shows the graphic model that MaxQda produced to represent various e-learning models. Notice how each of the axial codes in this model is succinctly defined by a quote from a respondent.

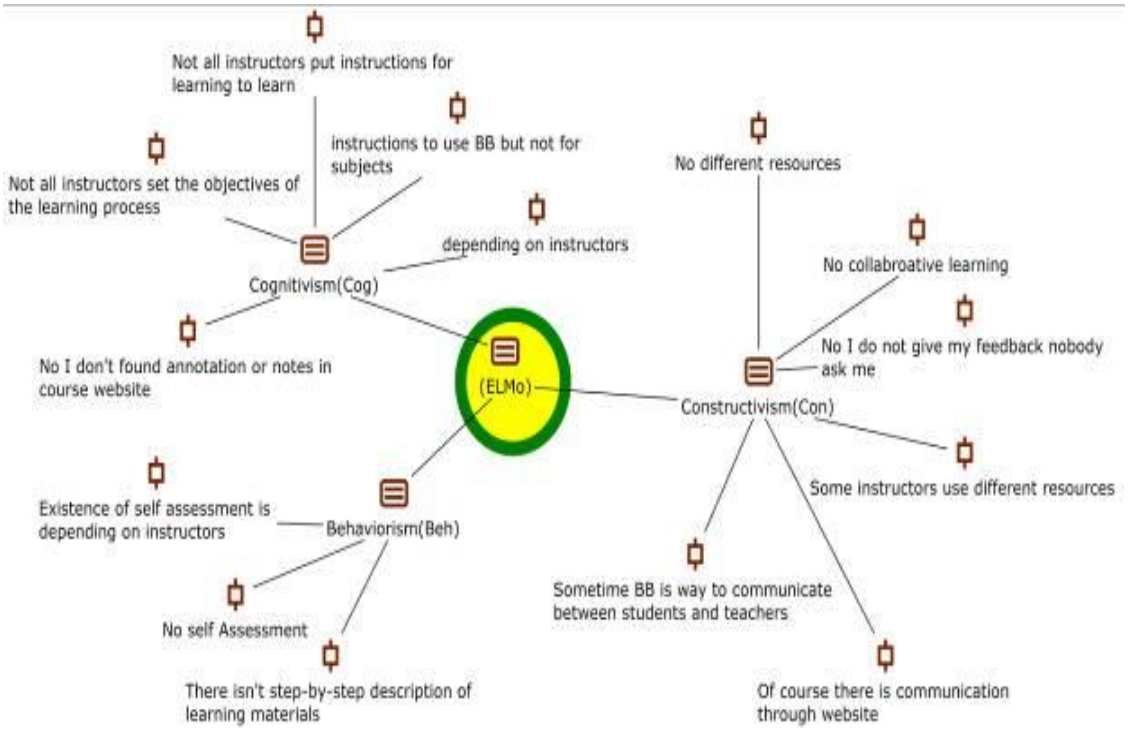


Figure 4.5 Diagram for E-learning Models.

At first glance, the results of these in-depth interviews may explore the value of incorporating e-learning into a traditional course in Middle Eastern universities. The ultimate question for educational research is whether e-learning model can be used to increase learning chances and achievements in both online and face-to-face environments. Specifically, the maturity model for best promoting e-learning success has not yet been completely explored.

The adoption of any particular e-learning model needs to be approached from a pedagogical perspective. We should think back to what the reasons were for embedding e-learning in an educational process, and consider carefully if that model of e-learning is appropriate. Can these models to learning and teaching continue to be supported as they were in the initial stages of their adoption? If not, then what kind of e-learning model and accompanying infrastructure support is necessary for teaching and learning in contemporary higher educational settings? These are useful questions to ask.

Against the backdrop of the current move from a behaviourist learning model with one-way knowledge transmission from lecturer to students towards the constructivist learning model with meaningful interaction among students, between students and lecturer, and between students and course content, the outcomes of the current research provide important insight to the prominent tools that students depend on for their learning. Outcomes suggest that usage of e-learning components still favours the traditional mode of learning which highlights limited involvement

of students in the learning process (that is, high usage of course content as opposed to discussion). This highlights major issues for curriculum designers and faculty members to consider, among them is the issues of how to guarantee that e-learning platforms are used effectively in enhancing collaborative learning. Such thoughts will guarantee that the potential benefit that can be provided by e-learning environments is fully explored and by so doing enhance students' learning. Furthermore, there may be a need for the insertion of more collaborative learning components in Blackboard to complement the existing components. Perhaps components, such as self-assessments and simulations can be added to further engage the interest of students, and promote interaction and peer learning.

4.15.4. E-learning Features

The in-depth interviews provided limited evidence that a considerable portion of the faculty integrated the following computer technologies – online exams, course contents, assignments, online attendance, grade centre and lecture slides into their classroom instruction. Further, the in-depth interviews provided evidence that the faculty seldom integrated communication components, calendar, forums and other resources, and seldom taught using video.

In terms of the opinions of the various components of Blackboard, the outcomes explain that almost all the students rate the course content component as very valuable. The course content component contained items such as lecture slides, assignments, course outlines and relevant articles. A plausible explanation for the high rating for this component is that it assists students' preparation for lectures. The second most commonly used component was the assignment, which provides them with a high positive evaluation because the students used it to understand the coursework requirement, submission of their coursework, checking of grades and feedback from module instructors.

On the other hand, the findings show that the calendar component was perceived as the least valuable, and a significant number of students never used it. This suggests that this component is being underused by students. Perhaps this component would have received more optimistic evaluation if it had hyperlinks and was positioned more successfully for reminding students of key deadlines, weekly lecture topics and activities that need to be carried out in preparation for weekly lecture.

Contrary to expectations, very litle evidence in support of the use of the chat component was found in the current research. Exclusively, findings suggest that the communication components were rarely used by students and were explained by a significant number of students as not valuable. This is surprising, given that the communication components appear to be one of the elements of e-learning that students are most likely to use in order to take advantage of the potential benefit of e-learning. This feeling is reinforced by the claims that e-learning assists group work (Hartford 2005) and helps address the challenges encountered by individuals who are apprehensive of face-to-face interaction (Hobbs 2002). One explanation for the rather unexpected findings from the current study could be that students used traditional personal email to communicate with their colleagues and the teaching team, rather than the integrated communication components of Blackboard. Another plausible justification is that the syllabus was designed with limited scope for group work activities. It could perhaps be argued that if the assignment was group-based, or if group-based tasks were built into the syllabus, there would

have been a relatively high usage of interactive components (for example, chat, discussion, mail) and students would have had greater optimistic evaluation of these tools. Another interesting finding of the study is that a vast majority of the students rated the forum and chat as not beneficial to them.

Comments illustrating the latter view are as follows:

"...I do not necessarily see the advantages of a discussion forum, e-calendar, e-board, other resources and chat. I suppose the problem with this is that the module was designed with limited scope for group work activities..."

(PU\EG\ S\44\ELE\Com\ ELF\CC\ ELF\C\R Str\O *\SA\Opi)*

(GU\OM\ S\145\ELE\Com\ ELF\CC\ ELF\C\R Str\E *\SA\Opi)*

(GU\BH\ S\86\ELE\Com\ELF\CC\ ELF\C\ R Str\S *\SA\Opi)*

(PU\BH\ S\84\ELE\Com\ ELF\CC\ELF\C\R Str\D *\SA\Opi)*

(PU\OM\ S\126\ELE\Com\ELF\CC\ELF\C\ R Str\L *\SA\Opi)*

"... Downloading course contents, uploading assignments, online attendance, previous exams and grade centre are the most important components.... "

(PU\EG\S\45\ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

(GU\OM\S\131\ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

(GU\BH\S\100\ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

(PU\BH\S\95\ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

(PU\OM\S\136\ELE\Edu\ELE\Org\ ELF\LS\AC\PE\GC\OA\ SA\Opi)

"...An online exam is an excellent tool for students who don't want to cheat but it needs good infrastructure..."

(PU\EG\S\46\ ELE\Edu\ ELF\OE\ SA\Opi)

(GU\OM\S\141\ ELE\Edu\ ELF\OE\ SA\Opi)

(GU\BH\ S\96\ ELE\Edu\ ELF\OE\ SA\Opi)

(PU\BH\ S\97\ ELE\Edu\ ELF\OE\ SA\Opi)

(PU\OM\ S\140\ELE\Edu\ ELF\OE\ SA\Opi)

Figure 4.6 shows the graphic model that MaxQda produced to represent e-learning features. Notice how each of the axial codes in this model is succinctly defined by a quote from a respondent.

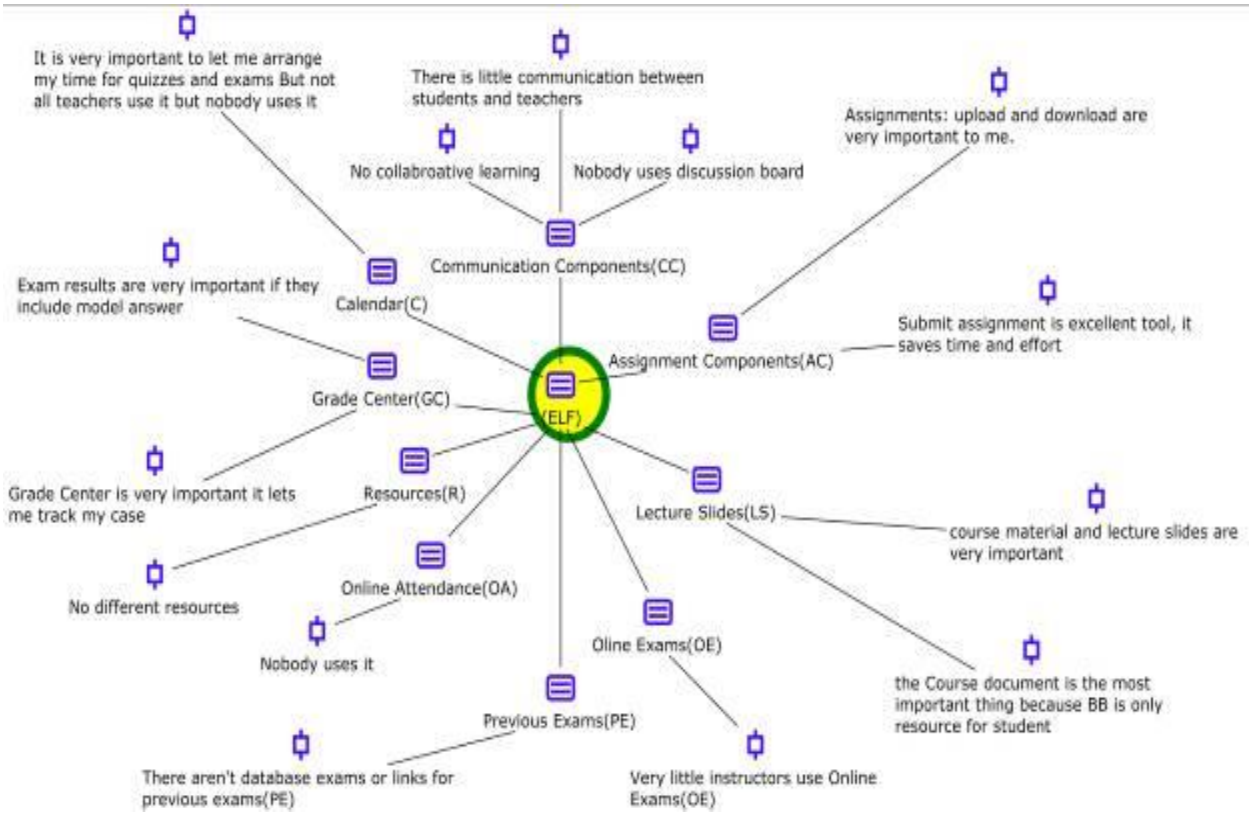


Figure 4.6 Diagram for E-learning Features.

4.16. Staff In-depth Interviews Data Analysis Results

The research conducted 75 in-depth interviews with academic members. The in-depth interviews contained questions about the dimensions investigated in this research. All the participants thought that maturity model for e-learning was an interesting experience for them; however, they had mixed attitudes to this new mode of learning. They pointed out some new issues and also expressed some concerns. In the same context, there are two dimensions: university attitudes towards e-learning and e-learning strategies which have been explained by staff (Appendix I).

The next section of the study explores what academic members' experience about the maturity model in detail.

4.16.1. Lecturers' Attitudes towards E-learning

All lecturers admit that they use e-learning in face-to-face settings. Thus, in-depth interviews show that lecturers use e-learning for delivering content and assignments to students. There were no lecturers using e-learning in the collaborative learning process. For the question of how they use e-learning in the learning process, lecturers said that they use BlackBoard for the delivery of the learning materials, assignments in place of face-to-face lectures, PowerPoint presentations, and tests. Lecturers also mentioned that they use PowerPoint presentations in face-to-face lectures and e-mail to answer questions about what kind of technological tools they use in the learning process (not only for collaborative learning).

Most of lecturers said that they tried to use the communication components but neither they nor students knew how to use it. Some lecturers also tried online exams and they admitted that sometimes students use online exams, but there are groups of students that are not active online at all. Other lecturers found out that it is not clear for them how it is best to use the e-calendar and for what purposes. A significant portion of lecturers admitted that neither development nor pedagogical support have been present when they were engaging in e-learning. This raises major issues for curriculum designers and faculty members to consider, among them is how to ensure that e-learning environments are used effectively in enhancing collaborative learning.

Following from this discussion, a considerable portion of lecturers admit that a face-to-face lecture familiarizing students with e-learning will help to sort out the issue of prior skill and the functionality of the technological infrastructure should be guaranteed before e-learning is implemented as a key fundamentals in the success of the e-learning.

The majority of them said that most universities have good technological infrastructure in terms of PC labs, networks, software and IT staff, except government universities in Egypt. In terms of the perception of the various components of Blackboard WebCT, the findings show that almost all the staff were interviewed said that the course content component as very valuable. On the attitude dimension, staff members interviewed were asked to give their opinions on the relationship between e-learning and learning, and more specifically on the efficiency of e-learning. The most common theme that was detected through their responses was that e-learning is a new trend in education and has a lot of potential, but it was not easy to engage with it as it needs preparation.

Comments illustrating the latter view are as follows:

"...I use e-learning just for uploading course materials and assignments."

(GU\EG\L\1\LA\Beh)
(PU\EG\ L\2\LA\Beh)
(GU\OM\L\101\LA\Beh)
(PU\BH\L\51\LA\Beh)

"…E-learning has a lot of potential and it might contribute in enhancing the educational outcomes however universities need some time to deal with this new method…"

(GU\OM\L\102\LA\Opi)
(GU\BH\L\65\LA\Opi)

"... we can't deal with e-learning thus, every year we have new book for same course to make profit from book selling..."

(GU\EG \L\23\ LA\ Opi\LA\ Beh)

"... We don't care about e-learning most of students need the core of information just to pass in final exam..."

(PU\EG\L\22\LA\Opi)
(PU\BH\L\68\LA\Opi)
(PU\OM\L\103\LA\Opi)

Figure 4.7 shows the graphic model that MaxQda produced to represent staff attitudes towards e-learning. Notice how each of the axial codes in this model is succinctly defined by a quote from a respondent.

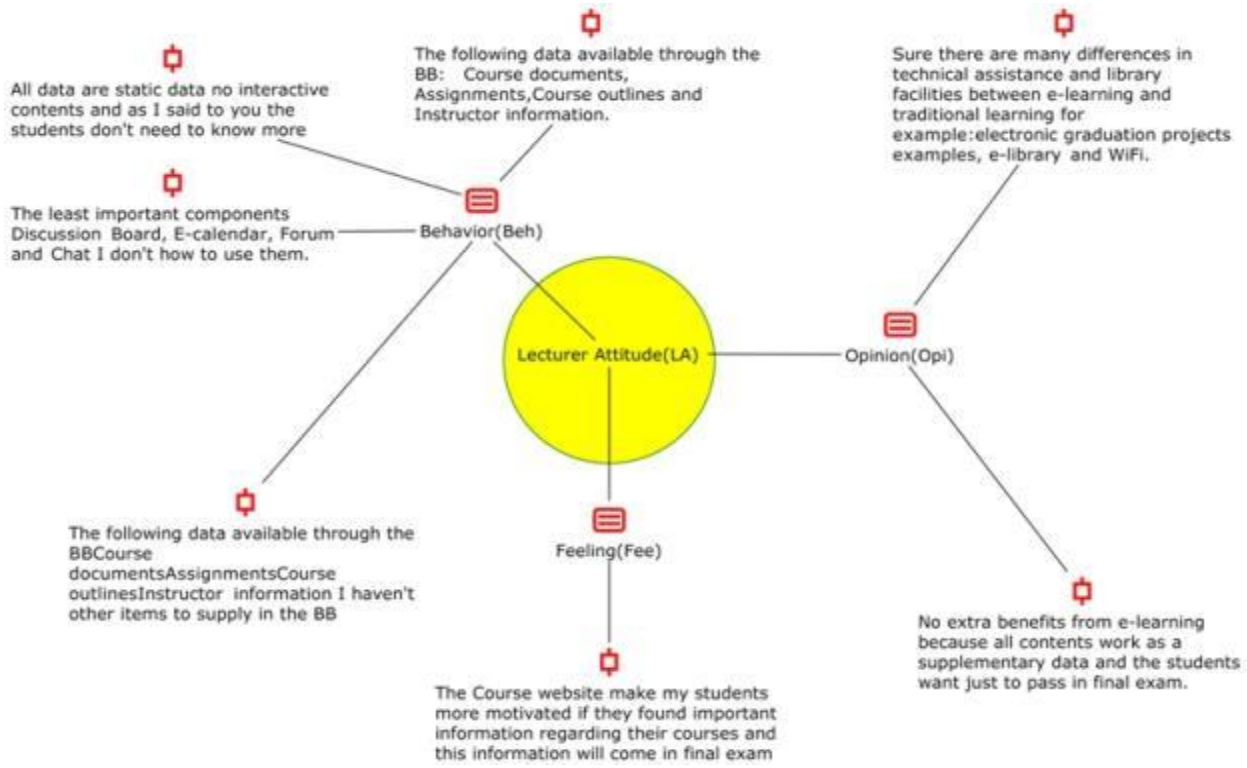


Figure 4.7 Diagram for Staff Attitudes.

4.16.2. E-learning strategies

Middle Eastern universities are embracing the concept of e-learning for teaching and administrative purposes. The fact that most universities contain an online component indicates a major change has occurred since the advent of Internet technology. Even though the percentage using full e-learning is very low.

The in-depth interviews show that these countries (Egypt,-Bahrain and -Oman) have some things in common, that is they are not successful in e-learning for the following reasons:

- They have no vision for e-learning.
- They have no government policies, programmes and financial support from substantial public funding.
- They have no earmarked action program for each year, and committees are not formed and funded to pursue the expected goals.
- They have weak investment in the Internet, ICT infrastructure and power (electricity). They rank highly among the world Internet users but they haven't strategies for e-learning.
- They don't embark on research because they don't believe that research is a fundamental part of e-learning strategy. In addition, they don't embark on training and awareness as an essential component of an e-learning strategy.

The lecturers said that sufficient financial support is also required for the successful completion of e-learning. The staff was also asked about the universities' role in supporting e-learning through different channels; for example; supporting, evaluating, developing, publicizing and building trust in e-learning. Most of the staff interviewed indicated a general impression that e-learning and technology supported learning in general. Most said that they are aware of some attention given to adopt new strategies in learning at their institutions, however, they were unable to identify tangible procedures to confirm this feeling. In other words, they have heard about new methods and development projects in recent years, but haven't seen any evidence in the real world.

The interviewees commented that they thought proper e-learning model is missing within education development, and that universities appear to be jumping from one plan to another without completing them or having a firm basis to carry on with further development. Another point, which might be raised based on the data gathered through the research, was that the current strategies maintained by most educational institutions do not support the use of technology in learning as there appears to be no significant deployment or practice of technology on-campus.

From the emerging issues of e-learning implementation within the Middle Eastern context, two problems emanate: 1) the inadequate usage of technology as an education delivery method or using e-learning for the sake of using e-learning; and 2) the unsuccessful use of technology to support learning.

Middle Eastern universities have no strategic plan which can be used to enhance the learning process depends on building an e-learning strategy that not only optimizes the use of technology

to create convenience for learners but also addresses important pedagogical problems in the Middle Eastern region.

Staff members were asked about the universities' role in developing the ICT skills of the staff who are engaged in e-learning.

Some staff members said:

"…Training and development of staff in government university are still in struggle way…"

(GU\OM\L\72\ Str\D)

"…There are no training and development of staff in my university…"

(PU\BH\L\73\ Str\D)

"…Nobody care about us…"

(GU\EG\L\74\ Str\D)

"…They don't want pay one dollar for developing…"

(PU\EG \L\75\Str\D)

Here are many comments, which confirmed the importance of Ministry of Higher education and universities' support. Some staff members said:

"...there is a serious trend adopted by the higher education authorities to support and improve the universities' technological infrastructure, this trend aims to deploy more use of technology in learning..."

(GU\OM\L\82\Str\S)

"...nothing adopted by the university to support and improve e-learning..."

(PU\BH\L\83 \Str\S)

"…There are services provided in a weak way with regards to providing the equipment and ease of communications and the speed of communication and exploring. There are real negative aspects..."

(GU\EG\L\85\ Str\S)

".... there are efforts by the university to maintain and develop the universities' technological infrastructure, these efforts aim to deploy more use of technology in learning..."

(PU\EG\L\84\ Str\S)

In the same context, relating to the evaluation issue staff interviewed recognized that the majority of universities haven't good methodology for evaluating e-learning. Some staff members said:

"…we haven't quality assurance system for traditional learning, thus can you imagine the current case for e-learning…"

(GU\EG\L\19\ Str\E)

"…we need quality assurance for e-learning like Europe…"

(GU\OM \L\110 \Str\E)

(GU\BH\L\55\Str\E)

"… we should enforce private universities to implement e-learning not just for sake of using e-learning …"

(PU\BH\L\70\ Str\E)

A significant number of staff interviewed, believe that we haven't clear organizational strategy for e-learning. Some of the staff interviewed said:

"… we should upload course materials, course outlines and assignments for any subject that is what we know about e-learning in middle east…"

(GU\OM \L\111 \Str\O)

(GU\BH\L\60\ Str\O)

(PU\EG\L\20\ Str\O)

Figure 4.8 shows the graphic model that MaxQda produced to represent staff attitudes towards e-learning. Notice how each of the axial codes in this model is succinctly defined by a quote from a respondent.

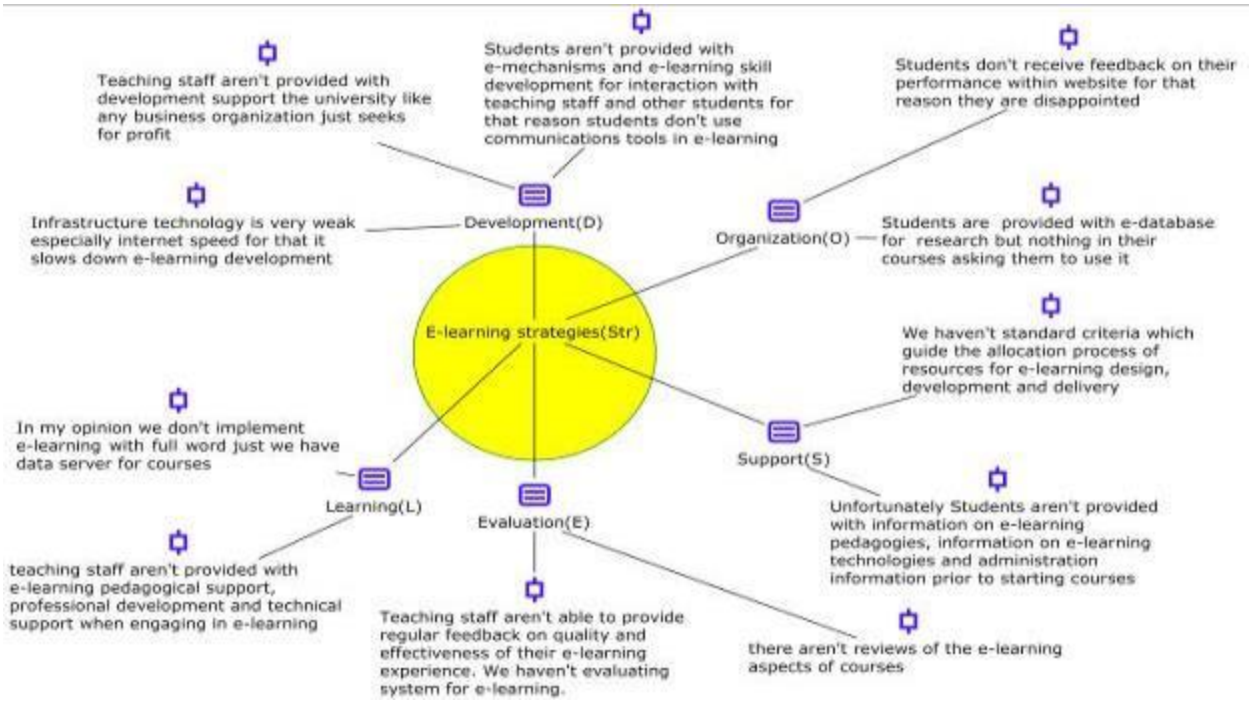


Figure 4.8 Diagram for E-learning Strategies.

The usage of e-learning components is still skewed towards the behaviourist traditional mode of learning which emphasizes limited involvement of students in the learning process (i.e. high usage of course content as opposed to chat and discussion).

Middle Eastern universities can no longer ignore e-learning. E-learning has become an integral part of higher education. How successfully this e-learning will be used to enhance the learning process depends on building maturity model for e-learning that not only optimizes the use of technology to create convenience for learners but also addresses significant pedagogical issues.

4.17. Developing Theory for the E-Learning Maturity Model in Middle East

This research aims to explore the e-learning maturity model to improve its adoption, implementation and development in higher education in the Middle Eastern. This model cannot be made unless its dimensions are identified. Therefore, it was necessary to conduct these in-depth interviews to identify these dimensions affecting the formulation of this model and try to conceptualize these dimensions in a framework in order to be able to verify its existence and determine its importance in Middle Eastern universities. The previous results of in-depth interviews included discussions of dimensions that focus on different factors affecting the development of e-learning maturity model. While several dimensions were raised through these in-depth interviews, there is also evidence that there is an agreement between many studies on the existence and importance of these and other dimensions. The question now is what are applicable dimensions for the e-learning maturity model in the Middle East.

The first question asked in this research was: *What are the criteria affecting the introduction of maturity model in the deployment of e-learning in Middle Eastern countries?* By combining data collected through the in-depth interviews and analyzing the responses, a framework could be suggested for the factors needed for e-learning maturity model in Middle Eastern universities.

Based on the in-depth interviews carried out by this research focusing on e-learning in Middle Eastern universities, the research findings revealed some of the issues that might be affecting the development of an e-learning maturity model.

Firstly, Middle Eastern private universities apply e-learning without clear strategy (e. g. one interviewee said "no more than PowerPoint presentations containing text and sometimes illustrative images, along with some hyperlinks to tutorials in other countries"). Moreover, there is no common understanding of e-learning strategies. While the remaining government universities rarely use any electronic-based learning techniques, the majority of government universities believe that e-learning is an efficient technique for learning, but they don't think it is applicable in the Middle East. Therefore, in-depth interviews were carried out to explore the implementation of different e-learning models with respect to the behaviourism, cognitive, and constructivist school of learning.

The main conclusion, based on the above in-depth interview results, was that there is little evidence to indicate that universities in the Middle East are sufficiently aware of e-learning and the positive qualities it offers. Most Middle Eastern students are used to being fed information, rather than searching for it, and they might not perform efficiently in collaborative learning mode. Also, Middle Eastern students need to "learn how to learn"; e-learning can only be effective when this has been accomplished. Also, these findings are in line with research conducted by IDSC (2004), who found that e-learning proved to be an effective tool for self-learning. Moreover, e-learning features are randomly organized without considering syllabus or collaborative learning concept.

Secondly, most of studies found that significant portion of students and staff had positive attitudes toward e-learning. Contrary to expectations, the findings of this study suggest that the majority of the students and staff had a negative view of the e-learning system. In this research, staff and students' attitudes divided into behaviour, feeling and opinion. The reason for focusing on behaviour, feeling and opinion is that they give indications about the potential for engaging in e-learning, as e-learning engagement might involve the students' attitudes. That is why this research attempts to make an insightful analysis of student's perceptions and readiness for e-learning. Once behaviour, feeling and opinion are explored, the attitude can be identified. The attitude towards e-learning is a result of student's beliefs, feelings and opinions. One explanation for the rather unexpected findings from the current research could be that the other researches were designed with limited scope for attitudes elements. For that reason, to understand the attitude you should go in three directions behaviour, feeling and opinions. For example, most of

students using e-learning for downloading materials, feel that e-learning is a data server and their faculties do not have e-learning readiness.

On the other hand, some conclusions were from through this research, focused on the attitudes of university staff members towards e-learning. The research found that most of the study sample, which, included 75 university staff members, believe that they do not have not adequate experience in e-learning, and also the majority of staff reported that they have not received training in using e-learning techniques. These findings compliment the preponderance of research, which has found that 7.3% of the study sample, which included 233 university staff members, believes that they have adequate experience in e-learning (Sadik 2007). In the same context, most of the instructors use e-learning for uploading PowerPoint slides, and also most of students use e-learning in downloading lecture slides. An insightful reading of these indications might indicate a situation of misunderstanding of the functions of e-learning. At the same time, it may give an impression that there is perception that traditional learning outweighs e-learning, which means that e-learning is being avoided rather than used.

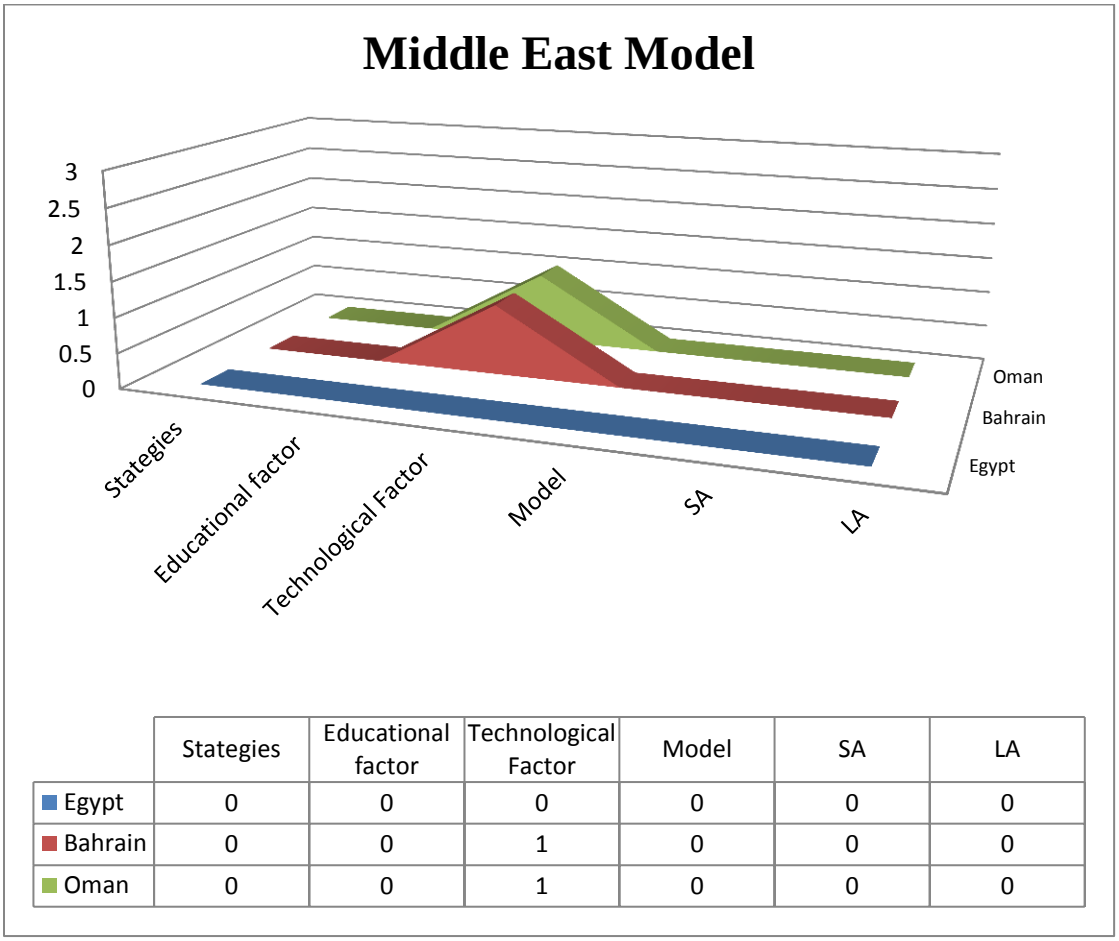
To some extent, this conclusion might account for the very low portion of the sample that use e-learning, and consequently this reflects their awareness of e-learning. Another, important point explored from this thesis is that there is no broad awareness of e-learning beyond academic circles. The main conclusion that could be suggested, based on the above results, is that there is little evidence to indicate that students and instructors in the Middle East are sufficiently aware of e-learning and its positive qualities.

Thirdly, the analysis of the data provided through previous discussion might tend to suggest that Middle Eastern universities' technology infrastructure needs improvement, especially in poor countries such as Egypt. Students should gain more access and freedom to use PCs and the internet, as well as their tutors, but this cannot happen unless more hardware, bandwidth capacities and support tools are provided, especially in government universities. Also, Middle Eastern countries can be divided into developing countries and rich countries. Each of these has private and government universities; if government universities are located in a rich country they will probably have good technology infrastructure but they haven't got suitable strategies or models for e-learning. Otherwise, if government universities are located in developing countries, neither models or strategies nor technology for e-learning are likely to exist. The following table (Table 4.5) summarizes this idea:

Critical factor for Success	Middle East countries			
	Developing Countries		Rich Countries	
	Private University	Government University	Private University	Government University
Infrastructure Technology	✓	×	✓	✓
Models	×	×	×	×
Strategies	×	×	×	×

Table 4.5 Current status in Middle East

Also, Figure 4.9 shows the current status for e-learning success factors in Middle Eastern countries.



	Stategies	Educational factor	Technological Factor	Model	SA	LA
Egypt	0	0	0	0	0	0
Bahrain	0	0	1	0	0	0
Oman	0	0	1	0	0	0

Figure 4.9 The Current Status for E-learning Success Factor at Middle East countries.

From the previous chart, we can conclude that there are similarities between Oman and Bahrain, where both countries exhibit the technology factor, whereas Egypt is the worst case.

Therefore, formulating the e-learning maturity model at Middle Eastern universities is based on the concept that the technology infrastructure should exist before starting the application of

the e-learning maturity model. Thus, the maturity model is an advanced step which is likely to be successful after ensuring that we have an adequate infrastructure technology.

4.18. Reconstructing E-learning maturity Model at Middle East Universities by Using Grounded Theory

During the selective coding process, all of the axial categories were reviewed to determine the connections between them, and to generate the Grounded Theory that emerged during this thesis. The conditions, action and interaction, and the results were examined during this selective coding process. Two comprehensive selective categories emerged that connected sets of the axial categories: (1) e-learning vision, and (2) consequences of the vision. The selective categories helped explain the criteria affecting the introduction of the maturity model in the deployment of e-learning in Middle Eastern countries. Thus, according to the participants, the dimensions for the e-learning vision essentially did not exist, which means an absence of the e-learning vision and therefore we should reap the fruits of consequences of the absence of a vision.

The absence of the e-learning vision was represented by the categories dealing mainly with institutional and pedagogical factors that impacted the introduction of the maturity model such as e-learning strategies, e-learning models, and e-learning features. Consequences of the absence vision included both individual and educational factors that impeded the participants from using e-learning, such as students' attitudes, staff members' attitudes and the effects of e-learning (See Table 4.6).

E-learning Vision	**Consequences of the E-learning Vision**
• E-learning Models	• Students' Attitudes
• E-learning Strategies	• University Attitudes
• E-learning Features	• Effects of E-learning on Students

Table 4.6 Selective Categories Representing Grounded Theory

The relationship between the larger selective categories provided the Grounded Theory that emerged during this thesis concerning the e-learning maturity model at Middle Eastern universities. The participants reported unawareness of the e-learning models, stating that their universities had not adopted a clear strategy for e-learning. Several students reported that they may have chosen to use some of e-learning features because of instructor's desire for them to use it. The participants demonstrated a lack of interaction in their studying, as if not connecting with their instructors.

The staff and students also stated being distracted from the e-learning vision. Negative attitudes distracted the students from e-learning effects, and academics found it difficult to balance e-learning features. The academics related having difficulties using e-learning features, reporting that it was difficult to establish connections among students. The students related that some of their expectations about e-learning effects were not met, which may have included communications, assessments, or step- by- step learning. Some students also related that they did not receive enough information or communication from their institution regarding benefits, features, effects and strategies for e-learning.

The in-depth interviews categories that were generated from this qualitative phase were congruent with, and extended, previous research and theory on the e-learning maturity model. However, none of the individual research studies reviewed depicted precisely the same maturity categories in a single study developed from this Grounded Theory study. Figure 4.10 explains the development of the e-learning maturity model in Grounded Theory.

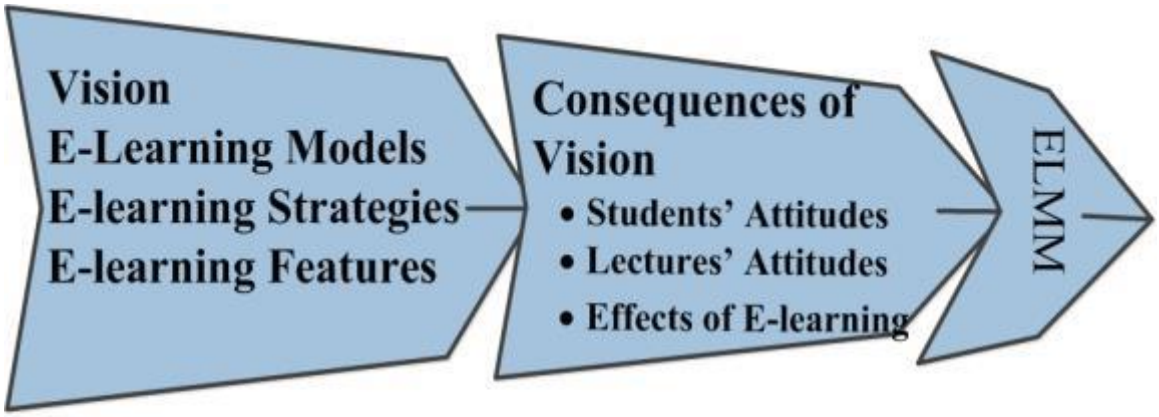


Figure 4.10 ELMM at Middle East Universities

4.19. Definition of Variables and Development of Surveys Items

The surveys were designed using the categories identified in qualitative data. Table 4.7 gives selected items developed to measure each variable with representative quotations from the qualitative data supporting each one. The final surveys instruments incorporated technical suggestions offered by respondents and an expert on survey design.

Item	Supporting Qualitative Data
E-learning Strategies *Organizing* E-learning should has clearly stating learning goals, organizing materials in order of increasing difficulty, helping students set realistic goals, attributing success to effort, and allowing students to become independent learners. *Supporting* Provision of support, information and guidance for learners. Professional development and support for tertiary teachers. *Learning* Learning effectiveness should be achieved through e-learning by a learner and instructor control perspective. *Developing* We should have high quality e-learning content by continuous development. *Evaluating* In the strategic planning process there are useful tools for evaluating existing e-learning initiatives or determining critical success factors.	"…No relationship between e-learning tools and curriculums…" "…There are no services provided in a fine way with regards to providing the equipment and ease of communications and the speed of communication. There are real negative aspects…" "…I did not take any training course and the computer was not among the subjects I studied at any level of my education. All I got was personal reading and practical knowledge gained from different sources that enabled me to deal with BlackBoard… " "… There is no strategic plan for e-learning evaluation…"

E-learning Models *Behaviourism* e-learning is used to remedy identified weaknesses, promote fluency, and support practice through tutorials, drill and practice software, online worksheets, and other forms of computer-based learning (Hung 2001; Roblyer 2003). *Cognitivism* Learners use e-learning (hypertext and hypermedia, bulletin boards, chats, computer-supported intentional learning environments, and computer mediated environments) to gather information, conduct research, communicate, decompose problems, share documents, and participate in open-ended learning (Cole 2004). *Constructivism* Will support students to build their own knowledge rather than depending on knowledge which comes from teacher.	"… Activities are not sequenced for increasing difficulty or complexity…" "… There are no different learning and cognitive styles…" "… There are no interactive learning activities…"
E-learning features The e-learning should has attractive features that appeal to students as follows: • Collaborative projects. • Reflective learning. • Personal development planning.	"…I think BlackBoard something like data servers…" "… I know two components (lecture slides and assignments)… "
Students' attitudes Breckler (1984) and Jones and Clarke (1994), proposed that affect, behaviour, and cognition are distinguishable, yet interrelated components of attitude.	"…There is a positive effect. For example, it is easy to attain lectures through BlackBoard…" "…I really didn't take much notice of it [the assessment feedback] to be honest…" "…I use BlackBoard for downloading PowerPoint slides…" "…Nothing called e-learning in our university…"

Instructors' Attitudes	"…I don't like group work, but I now that I have to use it. I am the person who likes to work independently and that is why I don't like to work in group. And there are students who like to work independently as me. Also there are no assignments require students work collaboratively…" "… There are no work group assignments…." "… I just believe in books…" "…There is no infrastructure for e-learning…"
Effects of e-learning *Educational* E-learning helps student to be self-directed. *Organizational* The ability to use a range of material in their own time and in their own environment has created more and deeper learning. *Communications* e-learning providing students with the information and resources that they require 24/7	"…Yes there is effect, very much, but unfortunately we take the bad sides of technology, especially in areas such as mobile phones, computers and the Internet. If you look at the chatting room in the western world, people discuss serious matters and problems, but if you enter the chat rooms in the Arab world, you will find that it is full of nothing or sex…" "… I prefer to submit my assignment through blackboard…" "… There are no responses from instructors…"

Table 4.7 Definition of variables and development of surveys items

In the next chapter the survey scales were developed based on the exploratory sequential design (First Phase).

Chapter Five Quantitative Data Analysis and Results

5.1. Introduction

This thesis tries to measure things that cannot directly be measured: so-called latent variables. In other words, information management researchers and psychologists even might be interested in measuring 'attitude', which is when someone has a positive or negative evaluation of something. Thus, you can't measure attitude directly: it has many facets. However, you can measure different aspects of attitude: you could get some idea of behaviour, feeling, whether the person has any new opinions, and so on. Having done this, it would be helpful to know whether these differences really do reflect a single variable. Put another way, are these different variables driven by the same underlying variable?

This chapter assesses the e-learning maturity model using six dimensions: e-learning models, strategies, features, students' attitudes, lecturers' attitudes and e-learning effects which were applied to examine and validate the hypothesized relationships among the six dimensions, and their effects on e-learning deployment. A total of 600 usable responses from university staff and students were used to validate the proposed thesis model. This stage can be divided into two main phases. The first phase will use exploratory factor analysis (principal component analysis) which can be used for identifying groups or clusters of variables. Also, this technique has two main uses: (1) to understand the structure of a set of variables; and (2) to measure an underlying variable. The second phase confirms the thesis model, based on Grounded Theory (Chapter 4) and exploratory factor analysis. Thus, Structural Equation Modelling (SEM) was implemented on the data captured.

Thus, this thesis was innovatory because it challenged (a) debates on mixed methods research, (b) views of qualitative research as primarily a precursor to more "rigorous" quantitative methods, (c) claims that the quest for rigour made qualitative research illegitimate, (d) beliefs that qualitative methods are impressionistic and unsystematic, (e) separation of data collection and analysis (-in the qualitative phase data was collected by in-depth interviews and analyzed by Grounded Theory second phase data was collected by questionnaires and analyzed by EFA and CFA-), and (f) assumptions that qualitative research could produce only descriptive case studies rather than theory development.

The structure of model and hypotheses will be discussed in the next section.

5.2. Research Model and Hypotheses

The proposed e-learning maturity model (ELMM), as perceived from students and lecturers' perspective, is illustrated in Figure 5.1 and 5.2.

ELMM hypothesizes that students' and lecturers' attitudes towards e-learning and effects of e-learning, which are known in this model as Consequences of E-learning Vision (Figure 5.2),

have been determined by e-learning models, strategies and features which are known in this model as an e-learning Vision (Figure 5.1).

These factors are investigated in Middle Eastern universities and have been explored from Grounded Theory in the qualitative phase. In other words, six dimensions or constructs were proposed to formulate this model: e-leaning models (ELMM-Mo or Instructional Model), strategies (ELMM-Str.), features (ELMM-Fea), students' attitudes (ELMM-StuAtt.), lecturers' attitudes (ELMM-LecAtt.) and e-learning effects (ELMM-Eff).

Thus, the aims of this thesis are twofold as follows:

- First, it seeks to identify and measure the criteria affecting the formulation of an e-learning vision.
- Second, how the e-learning vision may affect the implementation of e-learning and more specifically how this may affect the attitude of both learners and instructors towards e-learning and e-learning effects.

The first part of ELMM is presented here (Figure 5.1), followed by the hypothesis that E-learning vision is a three-factor structure comprising E-learning Models (ELMM-Mo), E-learning Strategies (ELMM-Str), and E-learning Features (ELMM-Fea).

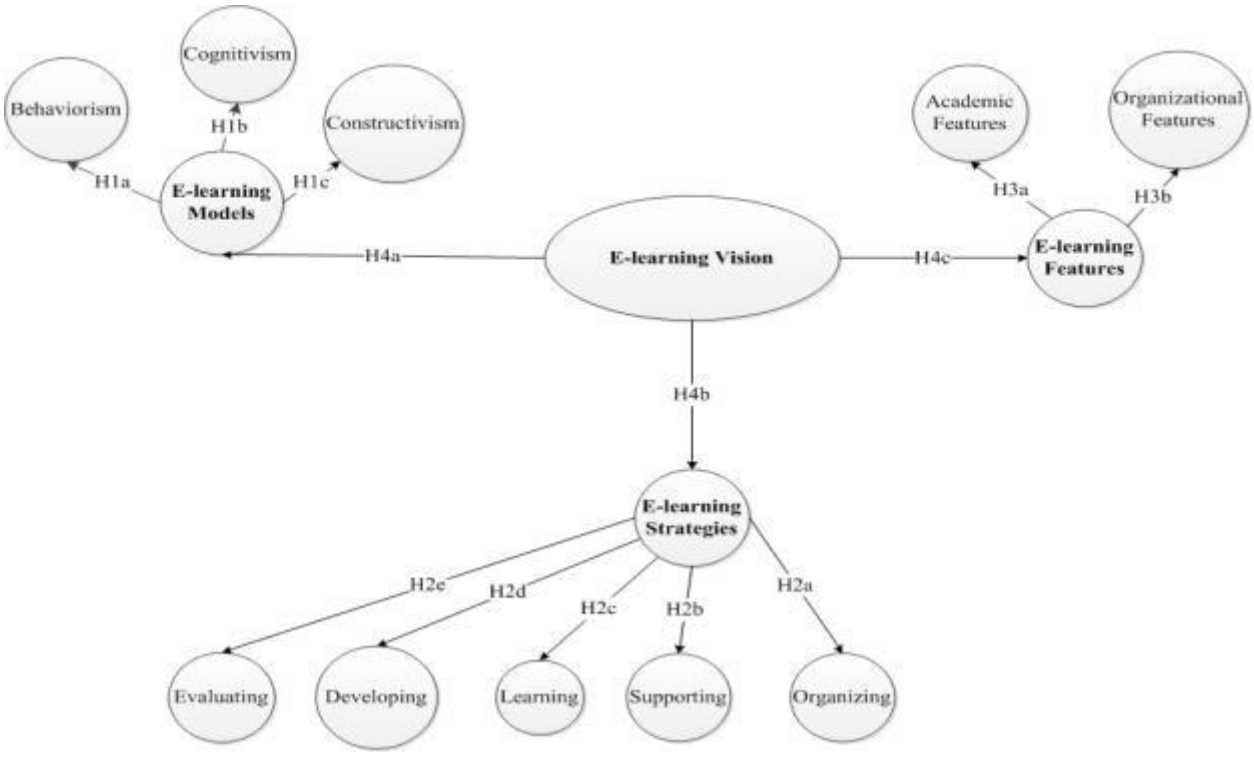


Figure 5.1 E-learning Vision

The second part of ELMM is presented here (Figure 5.2), followed by the hypothesis that Consequences of E-learning vision is a three-factor structure comprising Students' Attitudes (ELMM-StuAtt), Lecturers' Attitudes (ELMM-LecAtt), and E-learning Effects (ELMM-Eff).

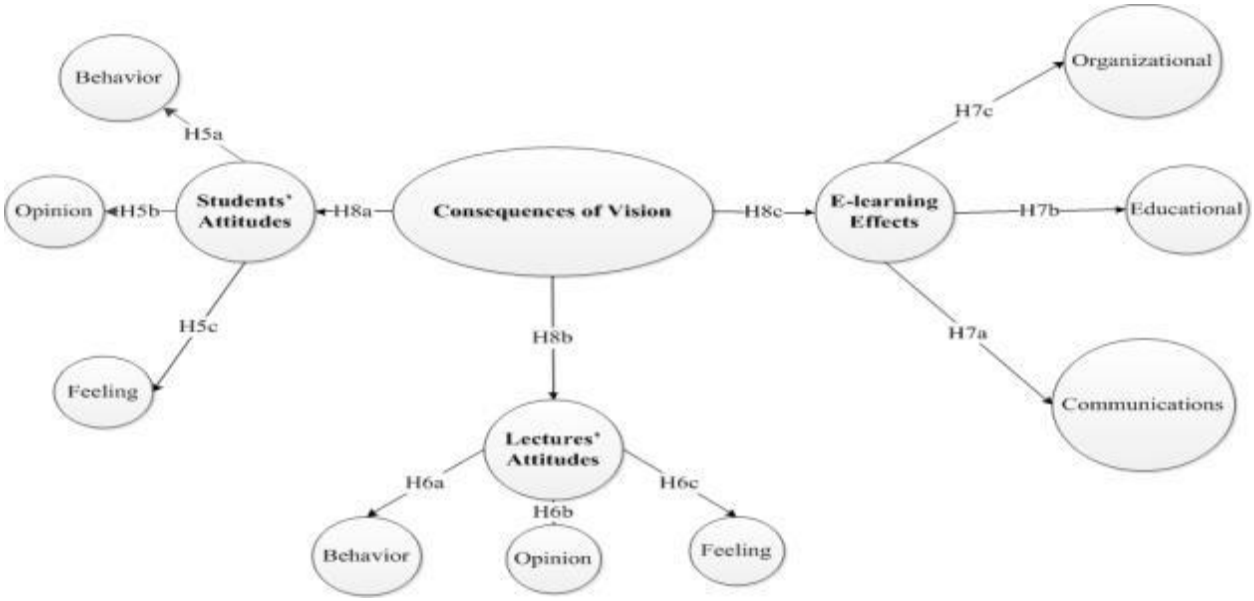


Figure 5.2 Consequences of E-learning Vision

Before any discussion of how we might go about testing this model, let's take a few minutes first to dissect the model and list its component parts as follows:

1. There are three ELMM-Mo factors, as indicated by the three ellipses labelled Behaviourism, Cognitivist, and Constructivism.
2. There are five ELMM-Str factors, as indicated by the five ellipses labelled Evaluating, Developing, Learning, Supporting and Organizing.
3. There are two ELMM-Fea factors, as indicated by the two ellipses labelled Academic and Organizational features.
4. There are three ELMM-StuAtt factors, as indicated by the three ellipses labelled Opinion, Behaviour, and Feeling.
5. There are three ELMM-LecAtt factors, as indicated by the three ellipses labelled Opinion, Behaviour, and Feeling.
6. There are three ELMM-Eff factors, as indicated by the three ellipses labelled Organizational, Educational, and Communications.

The most important issue in this research is the plausibility of a multidimensional ELMM structure for Middle Eastern universities. Although numerous studies have supported the multidimensionality of the construct for e-learning like many frameworks of critical success factors affecting e-learning development, the overall conclusion that might be raised is that they tried to cover every single detail related to online learning development, which might have resulted in a large amount of overlapping, and on the other hand, most of these researches

depended on either qualitative or quantitative (Elzayat 2010). So, this research achieved integration between qualitative and quantitative methods through exploratory sequential design.

The next section explains the hypotheses in details.

5.3. Modelling Research Hypotheses

The Confirmatory Factor Analysis (CFA) model to be tested in the present research hypothesizes a priori that:

- Responses to the ELMM can be explained by two phases.
- First phase consists of the ten first-order factors (Behaviourism, Constructivism, Cognitivism, Academic Features, Organizational features, Organizing , Supporting, Developing, Evaluating and Learning), three second-order factors (Instructional Model, Strategies and Features) and one third-order factor (e-learning vision).
- Each item has a non-zero loading on the first-order factor it was designed to measure, and zero loadings on the other factors.
- Error terms associated with each item are uncorrelated.
- Covariation among the ten first-order factors is explained fully by their regression on the second-order factor, and the same is seen in second-order factors. A diagrammatic representation of this model is presented in Figure 5.1.
- The second phase consists of the nine first-order factors (Students' Behaviours, Students' Opinions, Students' Feelings, Lecturers' Attitudes, Lectures' Opinions, Lecturers' Feelings, Communications Effects, Organizational Effects, and Educational Effects), three second-order factors (ELMM-Students' Attitudes, ELMM-Lectures' Attitudes and ELMM-Effects) and one third-order factor (Consequences of E-learning Vision)
- Each item has a non-zero loading on the first-order factor it was designed to measure, and zero loadings on the other factors.
- Error terms associated with each item are uncorrelated.
- Covariation among the nine first-order factors is explained fully by their regression on the second-order factor, and same is seen in second-order factors. A diagrammatic representation of this model is presented in Figure 5.2.

Table 5.1 explains hypothesized model through confirmatory factor analysis (CFA).

The First Phase		
One Third-Order Factors	Three Second-Order Factors	Ten First-Order Factors
E-learning Vision	ELMM-Models	Behaviourism
		Cognativism
		Constructivism
	ELMM-Strategies	Learning
		Developing
		Supporting
		Evaluating
		Organizing
	ELMM-Features	Academic Features
		Organizational Features
The Second Phase		
One Third-Order Factors	Three Second-Order Factors	Nine First-Order Factors
Consequences of e-learning vision	ELMM-Students' Attitudes	Behaviour
		Opinion
		Feeling
	ELMM-Lectures' Attitudes	Behaviour
		Opinion
		Feeling
	ELMM-Effects	Communications
		Educational
		Organizational

Table 5.1 Structure Hypothesis Model

Table 5.1 summarizes the hypothesized model. The first, second and third columns explain third, second and first order factors respectively. Moreover, each row explains the relationships between these factors.

Therefore, the ELMM will evaluate different dimensions of adaptive e-learning:

Firstly, the e-learning models (ELMM-Mo) construct will measure the reliability and maturity of implications for embedding what are commonly known as learning theories in e-learning. The maturity and reliability of an organization's e-learning models is one of the critical e-learning success factors. This is because learners should be able to repeat certain procedures based on the performance on analytical tests, or on tests within the sequence of learning activities. Also, online learning materials should be divided into small pieces to prevent cognitive overload and should include tasks for the different learning and cognitive styles.

Therefore, the following hypotheses were proposed:

Hypothesis 1a: Behaviourism will be significantly influenced by Instructional Model for E-learning.

Moreover, the syllabus and curriculum designer should join to new material with current material from long-term memory using advanced organizers and e-learning features to activate existing cognitive structures or to incorporate the details of the lesson and providing conceptual paradigms to allow the learner to retrieve existing mental paradigms. Therefore, the following hypothesis was proposed:

Hypothesis 1b: Cognitivism will be significantly influenced by Instructional Model for E-learning.

In addition, using self-assessment questions sets expectations and motivates the learner's current knowledge structure, using require assessment questions to motivate the requirement knowledge structure required for new materials. In the same context, learners should be provided with interactive activities to promote higher-level learning and social presence, and to help develop personal meaning. Therefore, the following hypothesis was proposed:

Hypothesis 1c: Constructivism will be significantly influenced by Instructional Model for E-learning.

Secondly, the e-learning strategies (ELMM-Str) construct will measure reliability and maturity of online library services, attitude toward the technical support team and e-learning initiative support. Thus, e-learning strategies require that the learning objectives should guide the design and implementation of courses website development.

In addition, formal criteria should guide the allocation of resources for e-learning design, development and delivery. Therefore, organizational support can be assessed by the sufficiency of personal computers and printing facilities available to learners on campus. Also, online access to library services anywhere, anytime, and the extent to which e-learning tools and technologies are incorporated into traditional courses and are other indications of organizational support to e-learning initiatives. Therefore, the following hypothesis was proposed:

Hypothesis 2a: Organizing strategy will be significantly influenced by e-learning strategies

Moreover, students and lecturers may be needed to provide them with technical assistance when engaging in e-learning and they should be able to provide regular feedback on the quality and effectiveness of e-learning. Therefore, the following hypothesis was proposed:

Hypothesis 2b: Supporting strategy will be significantly influenced by e-learning strategies

Also, course development, design and delivery should follow the e-learning theories, procedures and standards. Therefore, the following hypotheses were proposed:

Hypothesis 2c: Learning strategy for e-learning will be significantly influenced by e-learning strategies

Hypothesis 2d: Developing strategy for e-learning will be significantly influenced by e-learning strategies

In the same context, technical support can be assessed by maintaining the IT infrastructure components and to respond to learners and instructors' calls on time. Therefore, the following hypothesis was proposed:

Hypothesis 2e: Evaluating strategy will be significantly influenced by e-learning strategies

Thirdly, e-learning features (ELMM-Fea) construct measured on the pattern of use of a typical e-learning system by students in a campus- based university. Therefore, learners should be able to easily access and use e-learning course components and use instances for theoretical information. Moreover, tasks, procedures and assignments should enforce learners to apply and personalize the learning content offered. Therefore, the following hypothesis was proposed:

Hypothesis 3a: Academic features will be significantly influenced by e-learning features

Therefore, communication tools functionality and reliability are necessary for e-learning initiatives to succeed. In addition, course content availability is another important enabler of a successful e-learning model and learners should be provided with online services via student information systems such as online course registration. Moreover, assignment, calendar, chat component, online access to library services anywhere, anytime, and the extent to which e-learning tools and technologies are incorporated into traditional courses are other indications of organizational support to e-learning initiatives. Therefore, the following hypothesis was proposed:

Hypothesis 3b: Organizational features will be significantly influenced by e-learning features

Fourthly, universities with inadequate and incomplete collections of e-learning models, which are failing to meet their minimum requirements, will not think of deploying e-learning and encouraging any incorporation of e-learning theory into teaching and learning. These universities just own data server not e-learning. High levels of completeness, readiness, maturity and reliability of the e-learning models make the organization's support of e-learning easy and efficient. Campus-wide computer networks, student information systems, online library services and Internet availability will not be sufficient to encourage higher education institutions to adopt e-learning. Therefore, the following hypothesis was proposed:

Hypothesis 4a: Instructional Model for E-learning will be significantly influenced by e-learning vision.

Fifthly, e-learning strategies are seen as a crucial factor that affects the maturity level of e-learning courses in higher education institutions at Middle Eastern universities. Therefore, the following hypothesis was proposed:

Hypothesis 4b: e-Learning strategy will be significantly influenced by e-learning vision

All these factors would influence the student's attitude towards e-learning courses. When students feel that the e-learning satisfies their learning needs, they will become motivated to use e-learning courses and features. Thus, the e-learning features are one of the critical e-learning success factors at the e-learning maturity model. Therefore, the following hypothesis was proposed:

Hypothesis 4c: e-Learning features will be significantly influenced by e-learning vision

Sixthly, the (ELMM-StuAtt.) and (ELMM-LecAtt.) constructs assessed the lecturers and students characteristics that are related to e-learning tools and technologies used in the e-learning setup such as attitude towards e-learning and ability to use e-learning features. The lecturer and student's attitudes towards introducing e-learning tools into traditional courses at Middle Eastern universities are affected by how mature and reliable the organization’s e-learning models, strategies and features are.

Therefore, the following hypotheses were proposed:

Hypothesis 5a: Students' Behaviours will be significantly influenced by students' attitudes

Hypothesis 5b: Students' Opinions will be significantly influenced by students' attitudes

Hypothesis 5c: Students' Feelings will be significantly influenced by students' attitudes

Hypothesis 6a: Lecturers' Behaviours will be significantly influenced by lecturers' attitudes

Hypothesis 6b: Lecturers' Opinions will be significantly influenced by lecturers' attitudes

Hypothesis 6c: Lecturers' Feelings will be significantly influenced by lecturers' attitudes

In short, the e-learning effects (ELMM-Eff) construct measured organizational, educational and communications effects which aim to engender in students the characteristics required by new e-learning model; for example, becoming active, independent, strategic, reflective, cooperative, and responsible. Therefore, the following hypotheses were proposed:

Hypothesis 7a: Communications Effects will be significantly influenced by e-learning Effects

Hypothesis 7b: Educational Effects will be significantly influenced by e-learning Effects

Hypothesis 7c: Organizational Effects will be significantly influenced by e-learning Effects

The ease with which instructors and students access e-learning tools, interactive learning activities such as collaborative and cooperative learning, accessibility of student information systems, and availability of computer labs influence the lecturer and student characteristics and attitude towards e-learning. Therefore, the following hypotheses were proposed:

Hypothesis 8a: Students' Attitudes will be significantly influenced by Consequences of e-learning Vision

Hypothesis 8b: Lecturers' Attitudes will be significantly influenced by Consequences of e-learning Vision

Hypothesis 8c: E-learning Effects will be significantly influenced by Consequences of e- learning Vision

Table 5.2 provides a summary of ELMM hypotheses and effects.

	Hypothesis	Effect
Hypothesis 1a:	Behaviourism will be significantly influenced by Instructional Model for E-learning.	Instructional Model → Behaviourism
Hypothesis 1b:	Cognitivism will be significantly influenced by Instructional Model for E-learning.	Instructional Model→ Cognitivism
Hypothesis 1c:	Constructivism will be significantly influenced by Instructional Model for E-learning.	Instructional Model→ Constructivism
Hypothesis 2a:	Organizing strategy will be significantly influenced by e-learning strategies	e-learning strategies → Organizing strategy
Hypothesis 2b:	Supporting strategy will be significantly influenced by e-learning strategies	e-learning strategies → Supporting strategy
Hypothesis 2c:	Learning strategy for e-learning will be significantly influenced by e-learning strategies	e-learning strategies → Learning strategy
Hypothesis 2d:	Developing strategy for e-learning will be significantly influenced by e-learning strategies	e-learning strategies → Developing strategy
Hypothesis 2e:	Evaluating strategy will be significantly influenced by e-learning strategies	e-learning strategies → Evaluating strategy
Hypothesis 3a:	Academic features will be significantly influenced by e-	e-learning features → Academic features

	learning features	
Hypothesis 3b:	Organizing features will be significantly influenced by e-learning features	e-learning features → Organizing features
Hypothesis 4a:	Instructional Model for E-learning will be significantly influenced by e-learning vision.	e-learning vision → Instructional Model
Hypothesis 4b:	e-learning strategy will be significantly influenced by e-learning vision	e-learning vision → e-learning strategy
Hypothesis 4c:	e-learning features will be significantly influenced by e-learning vision	e-learning vision → e-learning features
Hypothesis 5a:	Students' Behaviours will be significantly influenced by Students' attitudes	Students' attitudes → Students' Behaviours
Hypothesis 5b:	Students' Opinions will be significantly influenced by Students' attitudes	Students' attitudes → Students' Opinions
Hypothesis 5c:	Students' Feeling will be significantly influenced by Students' attitudes	Students' attitudes → Students' Feeling
Hypothesis 6a:	Lecturers' Behaviours will be significantly influenced by Lecturers' attitudes	Lecturers' attitudes→ Behaviours
Hypothesis 6b:	Lecturers' Opinions will be significantly influenced by Lecturers' attitudes	Lecturers' attitudes→ Lecturers' Opinions
Hypothesis 6c:	Lecturers' feelings will be significantly influenced by Lecturers' attitudes	Lecturers' attitudes→ Lecturers' feeling
Hypothesis 7a:	Communications Effects will be significantly influenced by e-learning Effects	e-learning Effects→ Communications Effects
Hypothesis 7b:	Educational Effects will be significantly influenced by e-learning Effects	e-learning Effects→ Educational Effects
Hypothesis 7c:	Organizational Effects will be significantly influenced by e-learning Effects	e-learning Effects→ Organizational Effects
Hypothesis 8a:	Students' Attitudes will be significantly influenced by Consequences of e-learning Vision	Consequences of e-learning Vision →Students' attitudes
Hypothesis 8b:	Lecturers' Attitudes will be significantly influenced by	Consequences of e-learning Vision →

	Consequences of e-learning Vision	Lecturers' Attitudes
Hypothesis 8c:	E-learning Effects will be significantly influenced by Consequences of e-learning Vision	Consequences of e-learning Vision → E-learning Effects

Table 5.2 Summary of the hypotheses posited by ELMM.

Table 5.2 provided a summary of the hypotheses posited by ELMM. The next section explains the relation between EFA and CFA.

5.4 Philosophical Underpinnings for Quantitative Methodology

The research methodology utilized in this stage is based on Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) which are a family of statistical models that seek to explain the relationships among multiple variables (Shah & Goldstein 2006; Barrett 2007). EFA and CFA combine aspects of factor analysis and multiple regressions and enable the researchers to examine the dependence relationships among measured variables and unmeasured (latent) construct. All these statistical tools are used in association with a number of information technology fields which include e-commerce (Yu, Ha, Choi, & Rho 2005; Lee, Cheng, & Cheng 2007; Tan, Tyler, & Manica 2007; Turel, Serenko, & Bontis 2007), information technology acceptance (Davis 1986; Davis et al. 1989; Venkatesh & Davis 2000; Venkatesh 2001), web technology (Castaneda et al., 2007), and e-learning (Liaw et al., 2007a; Zhang et al. 2006; Nemanich et al. 2009). As suggested by Lu, Lai, and Cheng (2007); Hair, Black, Babin, Anderson, and Tatham (2006); Selim (2003); and Segars and Grover (1993, 1998) there are procedures needed to develop, validate, and test a Structure Equation Modelling (SEM).

Figure 5.3 shows the needed necessary six stages mapped to ELMM research. The research stages include instrument development and administration, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), ELMM structural model development, ELMM testing and validation, and finally substantive conclusions and recommendations.

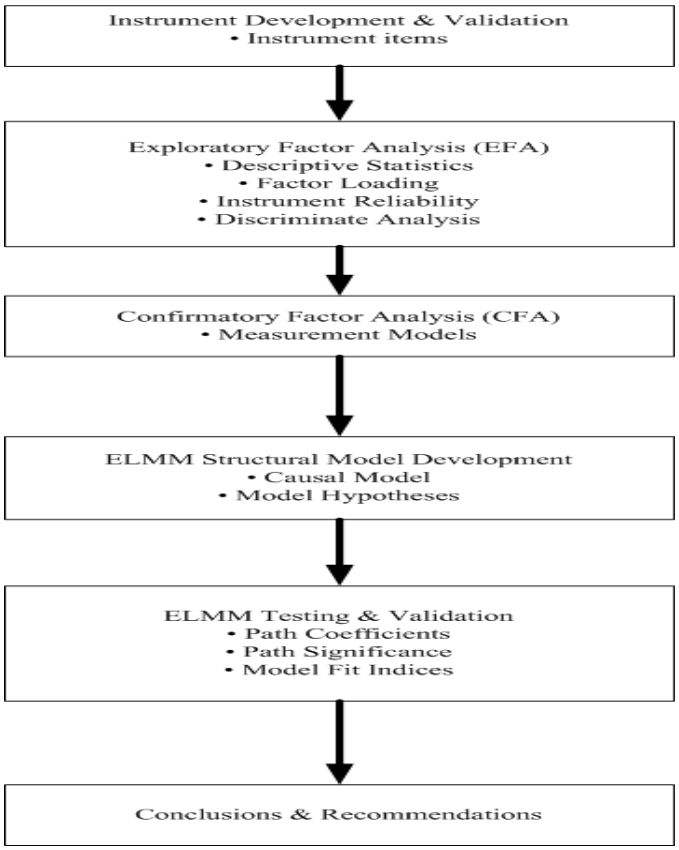


Figure 5.3 Stages of the Research Approach.

Figure 5.3 summarized the relation between Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and ELMM structural model development.

In the next part, the research steps will be explained.

5.5. Participants

In order to test the model hypotheses of the ELMM in this research, a survey was conducted. First, qualitative analysis for in-depth interview was used to identify and define factors related to ELMM and to generate survey items. Survey methodology was used then to measure staff and students' perceptions of these factors' influence on ELMM. On the other hand, the courses selected for the survey combined both e-learning and traditional learning tools. Traditional learning tools used included student–student and student–lecturer face-to-face interaction, a traditional textbook supplemented by online components (some selected textbooks are supplemented by CD/DVDs), and the presence of an instructor during the scheduled class time as a facilitator and lecturer. E-learning tools included electronic student–student and student–lecturer communication, asynchronous course material delivered through a course management system (Blackboard) webpage and in-class active and collaborative computerized learning activities.

The survey instrument was administered to 600 undergraduate students and staff. All courses were hybrid e-learning based courses. Students and staff were asked to do online surveys. Participants were enrolled in different courses offered by the College of Applied Science in Oman. Sixty percent of the respondents were enrolled in Network, 30% in Software and10% in Security. The average student age was around 20 years, with 60% females and 40% males. Nighty eight percent of the participants owned computers. They had an average GPA of 2.6/4.0. The participants' exposure to e-learning technologies varied from 1 to 3 years. Exposure to e-learning was defined as the previous experience with pure or hybrid e-learning courses.

In the next part the research instruments will be explained.

5.6 Instruments

Most of the items used to operationalize ELMM's constructs were adopted from tested and validated prior research articles (IHEP 2000; Oliver 2001; Khan 2001; Fresen 2005; Selim 2005; Boezerooij 2006) and qualitative data which was analyzed in Chapter 4. In the same context, the items used were validated and reworded to fit the e-learning maturity model at Middle Eastern universities. The actual surveys used are given in the methodology chapter. The "e-learning" term used in the actual survey meant e-learning tools and technologies used in the selected courses. This was explained to the participants during a short orientation held before conducting the surveys.

Firstly, the *e-learning models construct* was measured by fifteen items. These items were mainly developed from the qualitative phase and diverse researches which have been conducted (Mishra & Jain 2002; Partridge & Edwards 2005; lefoe 1998; Modritscher 2006; Nam & Smith-Jackson 2007; Hodges 2004; Ghaleb et al. 2006; Alderman & Milne 1999) to measure the influence of structure and semantic effects of e-learning on knowledge construction. The investigated theories in this scale were related to Behaviourism, Cognitivism, and Constructivism. The set of questions in the first instrument have been classified as the following: 1- Behaviourism (represented by items MBeh1 to MBeh3, these items examine the implications of commonly known behaviourism theory on online courses.). 2- Cognitivism (represented by items MCog1 to MCog3, these items examine the implications of commonly known cognitivism theory on online courses). 3- Constructivism (represented by items MCon1 to MCon9, these items examine the implications of commonly known Constructivism theory on online courses).

Secondly, *the strategies of implementing e-learning construct* was tested using 35 scale items, the thirty five items were adopted from Marshall & Mitchell (2007), and qualitative data which was analyzed in Chapter 4. The e-learning strategies were examined in terms of learning, development, support, evaluation, and organization. The set of questions in the second instrument has been classified as the following: 1- Learning (represented by items SL1 to SL10, these items assessed the university capabilities in handling learning strategies to support e-learning tools), 2- Development (represented by items SD1 to SD6, these items were developed

to capture the effectiveness of the university development strategy to support e-learning, its readiness, and its services.), 3- Support (represented by items SS1 to SS6, these items were developed to measure the effectiveness and efficiency of the university support to students and lecturers to encourage them to use e-learning.), 4- Evaluation (represented by items SE1 to SE3, these items were developed to capture the effectiveness of the university evaluation policy for e-learning.), 5- Organization (represented by items SO1 to SO9, these items were developed to measure the effectiveness and efficiency of the organizational support to e-learning).

Thirdly, *the e-learning features construct* was measured by nine items (ELF1-ELF9). These items were developed from Ituma (2011) and qualitative data which was analyzed in chapter 4. The nine items were developed to measure the effectiveness and efficiency of the university's support to e-learning. These features have been classified as the following: academic and organizational features. Academic features include: lectures slides, assignment components, previous exam papers, online exams and other resources, whilst organizational features include: e-calendar, communication components, online attendance, and grade centre.

Fourthly, *the fourth scale that measures the students' attitudes toward e-learning* was mainly developed from qualitative phase and various questionnaires which have been used in the studies conducted by (Jones 2007; Francis 1993; Paris 2004; Seyal 2002) to examine the attitudes of students towards e-learning. This scale had 18 items that represented statements concerning the students' attitudes towards e-learning. The participants were asked to specify their level of agreement or disagreement on a five-point scale ranging from '5' (strongly agree) to '1' (strongly disagree), with '3' undecided. The set of questions in the fourth instrument have been classified as the following: 1- Behaviour (represented by items SBeh1 to SBeh5 to measure the student's behaviour towards e-learning activities), 2- Feeling (represented by items SFee1 to SFee5, these items were developed to capture student's feeling about the effectiveness of e-learning and the university readiness and services), 3- Opinion (represented by items SOpi1 to SOpi8, these items were developed to measure the student's opinion about e-learning tools such as online exams for relevant information.).

Fifthly, *The lecturers' attitudes construct* was tested using 15 scale items, adopted from Mishra & Panda (2007), Sharma (2006), Lertlum & Papasratorn (2005), and Elango et al. (2008), to examine the attitudes of faculty members towards e-learning. The set of questions in the fifth instrument have been classified as the following: 1- Behaviour (represented by items UBeh1 to UBeh3, these items were developed to capture the instructor's behaviours towards e-learning), 2- Feeling (represented by items UFee1 to UFee3, these items were developed to capture the effectiveness of e-learning features), 3- Opinion (is represented by items UOpi1 to UOpi 9, these items were developed to measure the lecturer's attitude towards active learning activities that are facilitated using e-learning).

The sixth *scale that measures effects of e-learning on students* was mainly developed from phase one and a mixture of questionnaires which have been used in the studies conducted by Elango et al. (2008), Chou & Liu (2005), and Buzzetto-More (2008) to examine the effects of e-learning. This scale had 26 items that represented statements concerning the students' perceptions of the e-learning effects. The set of questions in the sixth instrument have been classified as the following: 1- Communications (represented by items ECom1 to ECom10, these items were developed to measure the effectiveness and efficiency of the communication tools through e-learning), 2- Education (represented by items EEdu1 to EEdu10, these items were developed to measure the effectiveness and efficiency of the educational tools through e-learning), 3- Organization (represented by items EOrg1 to EOrg6, these items were developed to measure the effectiveness and efficiency of the organizational tools through e-learning).

Items used in ELMM research were mainly assessing the e-learning models, features, strategies, students' attitudes, lecturers' attitudes and effects introduced to traditional courses with the objective of converting them to the e-learning maturity model which can followed at Middle Eastern universities . All items were measured using a five- point Likert-type scale that ranged from strongly disagree (1) to strongly agree (5). The surveys were distributed online during lectures and left with learners and staff to be filled in and submitted online. The learners and staff were informed that their responses would remain anonymous and were to be used in assessing ELMM introduced to traditional courses.

The next part reports the analysis results and suggests other issues not revealed in the statistical analysis.

5.7. Analysis plan

Factor analysis is a common psychometric method used to recognize a set of factors demonstrating underlying latent constructs from some larger number of observed variables (typically, as here, items on surveys). Moreover, factor analytic techniques, properly employed, help to conclude whether groupings of the observed variables on a survey establish the psychometric properties necessary to assert the reliably and validly measure for one or more intended constructs.

There are two main types of factor analysis: exploratory and confirmatory. As the names suggest, exploratory factor analysis (EFA) discovers the factor structure of the responses to some set of survey items, while confirmatory factor analysis (CFA) may be used to approve whether specified groupings of items properly measure the hypothesized constructs of interest. The statistical approach to developing the scales intended to assess the ELMM employed two complementary types of factor analysis. Typically, when constructing new scales, researchers perform EFA followed by CFA; that is, the survey is first administered to a representative sample and the data are subjected to an EFA, and the factor structure uncovered by the EFA is then subjected to a CFA using data collected from a new sample. In the present approach,

surveys were collected for the full sample which was then randomly split, with the sample (n = 100) to be used for the EFA steps and the other sample (n = 500) to be used for the CFA. This two-step approach to performing factor analyses, along with nearly all aspects of the present analytical plan, follows the comprehensive guidelines for scale development laid out by Worthington and Whittaker (2006).

Data was analyzed using Statistical Package for Social Science (SPSS) version 20 and Analysis of Moments Structure (AMOS) Version 20. The reliability and initial evidence of validity were reported based on results from Cronbach's alpha reliability and exploratory factor analysis (EFA). The EFA on the latent construct was carried out to determine whether the responses gathered could be grouped according to items in each of the hypothesized dimension. Following Byrne (2001), Hair et al. (2006), Kim and Mueller (1978), Tabachnick and Fidell (2007), and Worthington and Whittaker (2006), EFA using Principal Components Analysis (PCA) with direct oblique rotation was conducted to analyze factor structure of the construct. The cutoff point of 0.5 was used as the threshold to ensure practical significance for further analysis (Hair et al. 2006; Worthington & Whittaker 2006). The measurement model or CFA for each latent factor was examined by observing the model fit level.

An exploratory factor analysis using SPSS 20 was conducted on all the data. The rotated factor matrix, resulting from an Promax rotated principal components analysis extraction of the independent variables using the 1.0 eigenvalue cut-off criterion (see Tables 5.3 to 5.8), which indicates that sixteen factors emerged and reports their factor loadings. The data were tested using the SPSS 20 Exploratory Factor Analysis to evaluate the Cronbach alpha (see table 5.9). The Cronbach alpha indicator is the most frequently used test for assessing reliability. Some scholars consider that it underestimates reliability (Smith 1974). Consequently, the use of composite reliability has been suggested (Jooreskog 1971), using a cut-off value of 0.7 (Steenkamp and Geyskens 2006). The results show the value for Cronbach alpha factors is greater than .7. This is satisfactory. And all factor loadings were larger than 0.5, representing an acceptable significant level of internal validity. The factor loadings classified descending for each ELMM's constructs. All factor loadings were of an acceptable significant level.

In the next section, factor analysis was conducted to check the construct validity of the final surveys' scales used for the data collection and to check that the items in each scale load on the same factor (Garson 2009). Also, Cronbach alpha values were used to examine the reliability of the final surveys used for the data collection.

5.7.1 Validity and Reliability of the Survey Instruments

Validity and reliability of the survey instrument were examined after collecting the data from all the participants. Factor analysis was used to examine the construct validity of the survey instruments, while Cronbach alpha values were used to examine the reliability of the different scales in the survey instrument.

Next part explains EFA steps in details.

Exploratory Factor Analysis

First, however, factor analysis was done to reduce the number of variables that were included in the regression analyses. In principle, there are two types of factor analysis (Garson 2005): one is exploratory, in which the main goal is to uncover an underlying structure of a relatively large set of variables. The researcher's a priori assumptions are that any variable (or indicator) may be associated with any factor; i.e. there are no prior theory and factor loadings that intuitively structure the data. The second type is confirmatory, which seeks to determine if the number of factors and the loadings of measured (indicator) variables conform to what is expected on the basis of pre-established assumptions. The a priori assumption is that each factor is associated with a specified subset of indicator variables. As this study is exploratory in nature, an exploratory factor analysis was used to reduce the number of variables.

Underlying Factors

The first step in conducting an exploratory factor analysis is to make an initial decision about the number of factors underlying the structure which included variables. Two statistical criteria were used to determine the number of factors to extract:

1) The absolute magnitude of the factors' eigenvalues - in factor analysis, values that are used to help decide the number of factors to keep. Using Kaiser Criterion, only factors with eigenvalues of 1 or higher would be kept (Kremelberg 2011)-.

2) The relative magnitude of the eigenvalues (e.g. scree plot).

Rotation Method

Second, those factors with eigenvalues greater than one were rotated. Rotation made the factors more interpretable, and helped to make final decisions about the number of underlying factors. For this rotation, as explained in Chapter 3, the most appropriate form, Promax, was conducted.

Based on the outcomes of the Promax rotation the final number of factors determined sorting. This sorting took place on the basis of those variables with a high loading on the specific factor; the greater the value of a variable's loading, the more important that variable was in interpreting and considering the factor. As loadings above 0.5 are usually considered "high" and those below 0.4 are "low" (Garson 2005), in this study only those variables loading higher than 0.5 were included in the factor analysis.

As illustrated in Figure 5.3, this stage of the research methodology involved EFA. EFA was used to detect and assess sources of variation in tested items (Joreskog, Sorbom, du Toit &du Toit 2000). The EFA was carried out using the six constructs (Model, Strategy, Feature,

Students' Attitudes, Lecturers' Attitudes, and Effects) in order to assess each construct's discriminant validity that stipulates that items should load higher on their own construct than on the others used in ELMM model. The items used in the survey are attitudinal, which is likely to be correlated (oblique). Construct rotation is used to reorient the construct loadings so that the constructs are more interpretable. Accordingly, the Promax construct rotation method was used as an oblique method that relaxes the assumption that the constructs must be orthogonal (not correlated). Tables 5.3 to 5.8 show exploratory factor analysis for the surveys instrument validity. In other words, Tables 5.3 to 5.8 show SPSS version 20 output results for the Promax-rotated construct loadings. Items intended to measure the same construct demonstrated markedly higher factor loadings (>.50). The results confirm the adequate reliabilities of the individual items and the validity of the surveys instrument for further analysis. Together, the EFA results suggest that the instrument encompasses satisfactory convergent and discriminant validity. Therefore, it is safe to use the instrument in further confirmatory structural analysis.

In more details, factor analysis was conducted to check the construct validity of the final surveys' scales used for the data collection and to check that the items in each scale load on the same factor (Garson 2009). Principal components analysis was used to identify the number of basic factors in the independent variables scales. Results of the factor analysis showed that the 117 items representing the independent variables loaded on 16 dimensions with eigenvalues more than one. There are a variety of types of extraction methods in EFA, the most prominent of which include principal factor, principal-component factor, and maximum likelihood factor. There is no commonly agreed-upon approach, though under conditions of non-normal data (as is the case with exploratory of the ELMM Surveys items), the principal components analysis method is recommended (Costello& Osborne 2005) and was used in the present analyses. The minute an extraction method is decided upon and the EFA is run, it is recommended to verify the factorability of the data.

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is the sum of all the squared correlation coefficients in the numerator, and the denominator is the sum of all the squared correlation coefficients plus the sum of all of the squared partial correlation coefficients (Norusis 2003). A partial correlation is a value that measures the power of the relationship between a dependent variable and a single independent variable when the effects of other independent variables are held constant (Hair et al. 2006). Therefore, the method employed in the present analyses was the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, where values greater than .60 are considered to be adequate and greater than .80 are considered to be high.

Once the factors are extracted and the factorability of the data established, there are numerous different strategies for defining the number of factors to retain; the present analyses used the most common of these, the traditional eigenvalue cut-off of 1.0 (Tabachnick & Fidell 2007). Following the determination of the number of factors, the factor solution is "rotated" so

that the factors may be interpreted. There are multiple approaches to rotation of the factor solution. When the factors are expected to be correlated, as is the case with the ELMM, the most appropriate rotation method is oblique (rather than the commonly-used varimax, which assumes orthogonality of factors). Thus, the present analyses were rotated via a Promax rotation.

Selecting Variables

Once a factor solution is rotated, significant conclusions must then be made about which items in that solution adequately represent the factors. Following the recommendations of Tabachnick and Fidell (2007) and Worthington and Whittaker (2006), the loadings of each of the items on the factors should be at least .5, and not double-load onto any other factors at the .5 level. These guidelines would suggest that all items that double-loaded and/or loaded less than .5 on any factor may be considered insufficient indicators of the factors produced in the EFA, and when any items met these criteria, the EFA was rerun with those items removed. It is important to note, however, that factor solutions produced by an EFA are always contingent upon the items included in that analysis; when multiple iterations of EFAs are run, the latter iterations may have not included items that were dropped from the previous iterations but may in fact have not met the criteria for exclusion with the new set of variables from those latter iterations. This fact was considered in the present analyses, such that under certain circumstances, latter iterations of theEFAs checked whether inclusion of items dropped from previous iterations was appropriate.

Internal Consistency

One additional step was taken upon completion of the preceding steps. As the objective of the EFA was ultimately to produce a valid and reliable scale for each underlying construct, the internal consistency of the items comprising the resultant factors was checked via Cronbach's alpha. The conventional cut-off criterion for an acceptable alpha statistic is 0.7 and above (Nunnally1978). For any scale that did not meet this criterion, the items which were dropped in earlier iterations of the EFA were reconsidered (based on theory and face validity) in light of whether they might enhance the internal consistency of that scale. In such cases, these items were reintroduced into the last iteration of the EFA, and all steps of the analysis rerun. Additionally, for each item in the scales, the item-test correlation (i.e. the correlation between each item and the total scale) was inspected to ensure it was sufficiently high (here, at or above .60) and that the overall scale alpha was not notably reduced by including the item (Hinkin 1998). For scales in which one or more items did not meet these criteria, those items were dropped and the EFA rerun.

5.7.2 Exploratory Factor Analysis Results

The online surveys instruments consisted of six scales. which consisted of 117 ranking questions. The six scales are:

Scale 1: Measuring Instrument for an Instructional Model for E-learning

With respect to the instructional model, twelve variables were included in the factor analysis (Table 5.3). Principal component analysis (PCA) was conducted to determine the number of factors. Based on both the factor solutions suggested by the PCA and Kaiser's criterion (eigenvalues >1), the variables were grouped into three factors in descending order (Table 5.3 reports the results of the factors rotation). Factor analysis confirmed that the constructivism variables are most important and should be embedded in cognitivist and behaviourism.

Table 5.3 shows the factor loading of the items with a loading of 0.50 or greater. Interestingly, five items in Factor 1 had a loading ranging from 0.516 to 0.926; while the 5 items in Factor 2 had a loading from 0.572 to 0.902 and two items in Factor 3 had a loading ranging from 0.563 to 0.709. Thus, we could identify three factors as follow:

- Factor 1 involving five items that were related to the combining constructivism with cognitive, and therefore Factor 1 was described as a form of realism that stresses the reorganization of mental structures of an individual making sense of the world.
- Factor 2 involving five items that were related to the combining constructivism with behaviourism, and it was therefore described as an objectivist and monist perspective with regard to individual actions and decisions.
- Factor 3 involving two items that were related to the respondents' sociocultural about e-learning, and was therefore explained as a relativist perspective that emphasizes relations and processes between the individual and society so it was termed as the historicism factor.

Models' Construct			
	Component		
	Factor 1	Factor 2	Factor 3
MCon4- The website helps me to accomplish the Group projects.	.926		
MCon5- The website supports me by Streaming media.	.856		
MCon1- I usually Use the discussion forums and chat (both synchronous and asynchronous techniques) with my instructors and colleagues.	.729		
MCon9- Most of electronic materials depend on critical and creative thinking.	.575		
MCog3- It is straight forward for me to find information by using a search engine.	.516		
MCon7- I found different learning views provided via website.		.902	
MCon2- Usually the instructor responses quickly to students' e-mails.		.863	
MCon3- I usually connect with my colleagues through email.		.626	
MBeh3- I found the step-by-step description of learning materials in small chunks useful.		.577	
MBeh2- I can Use self-assessment questions as interactive activities in the learning materials.		.572	
MCon6- The social activities on the net increase my course interaction.			.709
MCon8- The website support Self-learning concept.			.563

Table 5.3 Exploratory factor analysis for the survey instrument validity (ELMM-Mo)

The aims of Table 5.3 can be summarized as the following:

- The factor analysis identified 12 items in three groups, as Factor 1, factor 2 and Factor 3.
- The Cronbach reliability alpha coefficient for the 12-item scale was 0.887.
- The 12 items had a reliability coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure e-learning models.

Scale 2: Measuring Instrument for E-learning Strategies

The same statistical procedure as above was then applied to the e-learning strategies. Based on the input of data twenty one strategies variables five factors were constructed (Table 5.4 shows the results). The factor analysis confirmed that the e-learning strategies should be sorted as follows: organizing, learning, supporting, developing and evaluating strategy.

Table 5.4 shows the factor loading of the items with a loading of 0.50 or greater. Interestingly, seven items in Factor 1 had a loading ranging from 0.515 to 0.720, while the five items in Factor 2 had a loading from 0.520 to 0.832, four items in Factor 3 had a loading ranging from .513 to .820, three items in Factor 4 had a loading ranging from.735 to .760 and two items in Factor 5 had a loading ranging from 0.592 to 0.713.

Thus, five factors could be identified as follow:

- Factor 1 involving seven items that were related to e-learning evaluating, and therefore this factor was described as a theoretical framework for evaluating.
- Factor 2 involving five items that were related to supporting, and it was therefore described as a pedagogical supported through the use of information and communications technology.
- Factor 3 involving four items that were related to developing, and it was therefore described as a planning/ development process to make learning process more efficient.
- Factor 4 involving three items that were related to e-learning, and it was therefore described as an explicit plan links e-learning technology, pedagogy and content used in courses.
- Factor 5 involving two items that were related to organizing, and it was therefore explained as E-learning technology decisions should follow an explicit plan.

Pattern Matrix[a]					
	Component				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
SE3- Regular reviews of the e-learning aspects of courses are conducted.	.720				
SO9- E-learning initiatives are guided by institutional strategies and operational plans.	.688				
SS1- Students are provided with technical assistance when engaging in e-learning.	.686				
SL1- Learning objectives guide the design and implementation of courses website.	.634				
SS4- Students are provided with personal and learning support services when engaging in e-learning.	.541				
SO4- Digital information use is guided by an institutional information integrity plan.	.516				
SD6- All elements of the physical e-learning infrastructure are integrated using defined standards.	.515				
SO7- Students are provided with information on e-learning pedagogies prior to starting courses.		.832			
SO6- Students are provided with information on e-learning technologies prior to starting courses.		.663			
SL7- E-Learning designs and activities actively engage students.		.537			
SE1- Students are able to provide regular feedback on the quality and effectiveness of their e-learning experience.		.527			
SD4- Courses are designed to support disabled students.		.520			
SL3- Students are provided with e-learning skill development.			.820		
SS2- Students are provided with library facilities when engaging in e-learning.			.669		
SL6- Students are provided with support in developing research and information literacy skills through the website.			.660		
SO2- Institutional learning and teaching policy and strategy explicitly address e-learning.			.513		
SD3- An explicit plan links e-learning technology, pedagogy and content used in courses.				.760	
SO1- Formal criteria guide the allocation of resources for e-learning design, development and delivery.				.756	
SS6- Teaching staff are provided with technical support in using digital information created by students.				.735	
SO3- E-learning technology decisions are guided by an explicit plan.					.713
SL10- E-Courses are designed to support diverse learning styles and learner capabilities.					.592

Table 5.4 Exploratory factor analysis for the survey instrument validity (ELMM-Str)

The factor analysis identified 21 items in five groups, as Factor 1, Factor 2, Factor 3, Factor 4 and Factor 5, and the Cronbach reliability alpha coefficient for the 21-item scale was 0.934. The 21 items had a reliability coefficient indicating high inter-item correlation, indicating that these factors could be used to comprise an instrument to measure e-learning strategies.

Scale 3: Measuring Instrument for E-learning Features

The same statistical procedure was conducted for the e-learning features. As can be seen in Table 5.5, two factors were constructed:

1. Academic features
2. Organizational features

Table 5.5 shows the factor loading of the items with a loading of 0.50 or greater. Interestingly, five items in Factor 1 had a loading ranging from 0.611 to 0.791, while the four items in Factor 2 had a loading from 0.675 to 0.754. Thus, two factors could be identified as follow:

- Factor 1 involving five items that were related to the academic features, and therefore this factor was described as academic features through the use of information and communications technology.
- Factor 2 involving four items that were related to the organizing features, and therefore it was described as organizational features through the use of information and communications technology.

Component Matrix[a]		
	Component	
	Factor 1	Factor 2
9-ELF\R-Other Resources are very helpful	.791	
2-ELF\AC-Assignment Components are very important	.761	
4-ELF\OE-Online Exams are good tool	.722	
1-ELF\LS-I found the Lecture Slides in the course Website valuable	.698	
3-ELF\PE-Previous Exams are useful	.611	
8-ELF\OA-Online Attendance is useful tool		.754
7-ELF\GC-Grade Center is very useful		.690
6-ELF\CC-Communication Components help me to communicate with others		.677
5-ELF\C-E-Calendar is important tool		.675

Table 5.5 Exploratory factor analysis for the survey instrument validity (ELMM-Fea)

The factor analysis identified nine items in two groups, Factor 1 and Factor 2, and the Cronbach reliability alpha coefficient for the nine items scale was 0.877. The nine items had a reliability coefficient indicating high inter-item correlation, indicating that these factors could be used to comprise an instrument to measure e-learning features.

Scale 4: Measuring Instrument for Students' Attitudes

The same statistical procedure was conducted for the students' attitudes. As can be seen in Table 5.6, two factors were constructed:

1. Opinion and Feeling were combined
2. Behaviour

The factor analysis explained that the students' opinions and feelings are the most important factors in students' attitudes not just behaviours. One explanation for the rather unexpected findings from the current study about negative attitudes of students towards e-learning could be because other researches depended on students' behaviours in analyzing attitudes.

Table 5.6 shows the factor loading of the items with a loading of 0.50 or greater. Interestingly, 13 items in Factor 1 had a loading ranging from 0.590 to 0.723, while the two items in Factor 2 had a loading from 0.584 to 0.782. Thus, two factors could be identified as follows:

- Factor 1 involving 13 items that were related to the combination of feelings and opinions, and therefore Factor 1 was described as a subjective representation of emotions and judgment formed about e-learning, not necessarily based on fact or knowledge.
- Factor 2 involving two items that were related to behaviours, and it was therefore described as a response of students to e-learning.

Pattern Matrix[a]		
	Component	
	Factor 1	Factor 2
SFee2- I feel with power when asked to use WebSites for assignment.	.723	
SFee1- If I had a choice I would prefer to learn from a website than from a book.	.718	
SOpi8- I got support and technical information about how to use communication and discussion board tools	.699	
SFee4-Learning through Websites encourages me.	.697	
SOpi7-E-learning is efficient as teaching method.	.685	
SOpi4-Finding your way around a website is easier than finding your way around a Book.	.683	
SFee5- My university has got the technology needed for the delivery of e-learning	.676	
SOpi6- Many of instructors encourage me to use e-learning methods.	.673	
SOpi1- The Web based assignment was easier to read than the paper based assignment	.671	
SFee3- I feel online exam is a good tool.	.664	
SOpi3- Students learn more using Web Assisted activities than Paper Assisted activities	.657	
SOpi5-I find it easy to learn online.	.654	
SOpi2-The Web quiz was easier to understand than the Paper quiz activity.	.590	
SBeh4- Using Websites has increased my interaction with other students		.782
SBeh1- If given a choice I would first search for a website to find information for an assignment before I search for a book.		.584

Table 5.6 Exploratory factor analysis for the survey instrument validity (ELMM-StuAtt)

The factor analysis identified 15 items in two groups, Factor 1and Factor 2, and the Cronbach reliability alpha coefficient for the 15-item scale was 0.885. The 15 items had a reliability

coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure students' attitudes.

Scale 5: Measuring Instrument for Lecturers' Attitudes

An exploratory factor analysis was also done for the lecturers' attitudes. To determine the number of factors, PCA was conducted using only the 11 variables that showed statistically significant differences between the opinions, feelings and behaviours. Based on the solutions suggested by the PCA and the outcomes of the Kaiser's criterion (eigenvalues > 1), the variables were grouped into two main factors. Factor analysis explored that the lecturer's opinion is very important where it has effect on his or her behaviour and feeling.

Each of the initial factors was rotated using Promax in order to determine the item-composition. Table 5.7 shows the results of the factor scores. Table 5.7 shows the factor loading of the items with a loading of 0.50 or greater. Interestingly, seven items in Factor 1 had a loading ranging from 0.575 to 0.842, while the four items in Factor 2 had a loading from 0.630 to 0.928. Thus, two factors could be identified as follow:

- Factor 1 involving seven items that were related to opinions about e-learning, and therefore this Factor 1 was described as the beliefs or views of a large number or majority of instructors about e-learning.
- Factor 2 involving four items that were related to the attitudes and it was therefore described as reaction of instructors towards e-learning.

Pattern Matrix[a]		
	Component	
	Factor 1	Factor 2
UOpi2-E-Learning increases access to education and training.	.842	
UOpi5-E-Learning can engage learners more than other forms of learning.	.759	
UBeh1- I am Using E-learning in collaborative learning.	.735	
UOpi6-E-Learning increases the quality of teaching and learning because it integrates all forms of media; print, audio, video, and animation.	.720	
UOpi9-E-Learning enhances the pedagogic value of a course.	.691	
UOpi8-E-Learning improves communication between students and teachers.	.596	
UOpi3-E-Learning will increase my efficiency in teaching.	.575	
UOpi7-E-Learning increases the flexibility of teaching and learning.		.928
UBeh2- I am using e-exams whenever I can.		.730
UFee2- Blackboard is easy to handle.		.687
UFee3- E-calendar helps me to coordinate with my students.		.630

Table 5.7 Exploratory factor analysis for the survey instrument validity (ELMM-LecAtt)

The factor analysis identified 11 items in two groups, Factor 1 and Factor 2, and the Cronbach reliability alpha coefficient for the 11 items scale was 0.873. The 11 items had a reliability coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure instructors' attitudes.

Scale 6: Measuring Instrument for E-learning Effects

The same statistical procedure as above was then applied to the effects of e-learning. Based on the input of data twenty six variables, three factors were constructed (Table 5.8 shows the results).

The factor analysis explored that the communications between students and lecturers have significant effects on students.

Table 5.8 shows the factor loading of the items with a loading of 0.50 or greater. Interestingly, 19 items in Factor 1 had a loading ranging from 0.755 to 0.869, while the seven items in Factor 2 had a loading from 0.681 to 0.914. Thus, two factors could be identified as follow:

- Factor 1 involving 19 items that were related to combine educational and communications effects about e-learning, and therefore Factor 1 was described as a collaborative learning.
- Factor 2 involving seven items that were related to organizing, and it was therefore described as organizational effects from e-learning.

Pattern Matrix[a]		
	Component	
	Factor 1	Factor 2
ECom1-E-learning provided a reliable means of communication.	.869	
EEdu8- I read the instructor comments on my assignments.	.825	
ECom4-The discussion section is a great way to interact with the instructor.	.824	
EEdu5- I believe that course Websites enhance learning.	.811	
EEdu3- I found the course Website to be a helpful resource.	.809	
ECom3-The discussion section is a great way to interact with my fellow classmates.	.808	
EEdu2- I used the course Website to help me understand course information.	.807	
ECom6-I emailed the instructor through the course Website.	.805	
ECom10-Course Websites extend personal interactions.	.804	
EEdu1- I found the links contained on the course Website valuable.	.797	
EEdu4- I regularly used the course Website to answer my questions.	.795	
ECom9-The course Website increased my interactions with the instructor.	.792	

EEdu9- I found taking exams online convenient.	.789	
ECom2-E-learning portion allowed for social interaction.	.788	
ECom8-The course Website helped to create a sense of community.	.784	
ECom7-I regularly used the discussion section.	.780	
EEdu7- The online lecture notes were a valuable resource.	.769	
EEdu6- I believe that course Websites will play an important role in college education in the future.	.764	
ECom5-The discussion section helped me to ask and answer questions.	.755	
EOrg6- I liked that I had the ability to check my assignment grades online.		.914
EOrg4- I found the online submission of assignments convenient.		.857
EOrg2- I found the calendar section to be a valuable resource.		.849
EOrg3- I keep track of my grades on assignments and tests online.		.836
EOrg5- I checked the assignment section for my grades.		.804
EOrg1- I enjoyed submitting my assignments online.		.794
EEdu10- The course Website is a great place for the instructor to place handouts.		.681

Table 5.8 Exploratory factor analysis for the survey instrument validity (ELMM-Eff)

The factor analysis identified 26 items in two groups, Factor 1 and Factor 2, and the Cronbach reliability alpha coefficient for the 26-item scale was 0.946. The 26 items had a reliability coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure effects of e-learning.

5.7.3. Reliability

The research instruments' reliability was assessed using Cronbach's alpha (α). Table 5.9 shows α value for the ELMM's six constructs. The suggested acceptable cut-off value for α is .70 (Hair et al. 2006).

The composite reliability of each construct was assessed using Cronbach's alpha. Robinson, Shaver and Wrightsman (1991) and DeVellis (2003) suggested that an alpha value of .70 should be considered acceptable.

Table 5.9 shows the mean and standard deviation of each item and the Cronbach alpha coefficient used in ELMM constructs. As shown in Table 5.9, the reliabilities of all the constructs are between .87 and .96, well within the range suggested by Robinson et al. (1991) and DeVellis (2003).The descriptive statistics for each construct items are shown in Table 5.9. All means ranging from 2.48 to 1.53. This indicates a negative response to the constructs that are measured in this study. The standard deviations for all variables were less than one and this indicates that the item scores were around the mean scores and have a narrow spread around the mean.

Moreover, in Table 5.9 each construct included a number of items that are highly reliable according to the analysis results. The constructs items' means ranged between 1.5 and 2.4, which gave a primary indication of how the sample evaluated the status of each of the constructs. The model construct has mean values ranged between 2.1 and 2.4, indicating that from the sample's point of view there is no clear model for e-learning.

Construct	Item	Mean	SD	α
Model	MBeh1	2.10	0.87	0.91
	MBeh2	2.41	0.86	
	MBeh3	2.32	0.92	
	MCog1	2.33	0.91	
	MCog2	2.19	0.80	
	MCog3	2.17	0.93	
	MCon1	2.30	0.95	
	MCon2	2.40	0.81	
	MCon3	2.29	0.89	
	MCon4	2.09	0.76	
	MCon5	2.22	0.84	
	MCon6	2.28	0.93	
	MCon7	2.23	0.85	
	MCon8	2.22	0.90	
	MCon9	2.16	0.95	
Strategy	SL1	2.17	0.87	0.96
	SL2	2.38	0.94	
	SL3	2.31	0.88	
	SL4	2.26	0.91	
	SL5	2.14	0.89	
	SL6	2.30	0.88	
	SL7	2.19	0.79	
	SL8	2.23	0.93	
	SL9	2.30	0.83	
	SL10	2.28	0.91	
	SD1	2.31	0.98	
	SD2	2.26	0.95	
	SD3	2.29	0.89	
	SD4	2.25	0.86	
	SD5	2.19	0.92	
	SD6	2.10	0.82	

	SS1	2.32	0.92	
	SS2	2.31	0.86	
	SS3	2.26	0.89	
	SS4	2.24	0.93	
	SS5	2.24	0.93	
	SS6	2.29	0.94	
	SE1	2.11	0.79	
	SE2	2.19	0.93	
	SE3	2.22	0.87	
	SO1	2.22	0.80	
	SO2	2.31	0.95	
	SO3	2.26	0.92	
	SO4	2.26	0.84	
	SO5	2.27	0.97	
	SO6	2.34	0.84	
	SO7	2.26	0.88	
	SO8	2.33	0.82	
	SO9	2.26	0.86	
Features	1-ELF\LS	2.20	0.83	0.88
	2-ELF\AC	2.28	0.94	
	3-ELF\PE	2.21	0.91	
	4-ELF\OE	2.22	0.92	
	5-ELF\C	2.14	0.92	
	6-ELF\CC	2.10	0.83	
	7-ELF\GC	2.11	0.86	
	8-ELF\OA	2.28	0.93	
	9-ELF\R	2.25	0.99	
Students' Attitudes	SBeh1	2.26	0.92	0.87
	SBeh2	2.34	0.88	
	SBeh3	2.24	0.83	
	SBeh4	2.35	0.93	
	SBeh5	2.22	0.89	
	SFee1	2.17	0.88	
	SFee2	2.22	0.82	
	SFee3	2.25	0.94	
	SFee4	2.27	0.83	
	SFee5	2.23	0.84	
	SOpi1	2.37	0.85	
	SOpi2	2.28	0.90	

	SOpi3	2.16	0.93	
	SOpi4	2.17	0.80	
	SOpi5	2.30	0.92	
	SOpi6	2.15	0.90	
	SOpi7	2.24	0.88	
	SOpi8	2.10	0.87	
Lecturers' Attitudes	LecBeh1	2.23	0.85	0.91
	LecBeh2	2.29	0.80	
	LecBeh3	2.32	0.90	
	lecFee1	2.29	0.87	
	lecFee2	2.25	0.82	
	lecFee3	2.11	0.83	
	LecOpi1	2.21	0.78	
	LecOpi2	2.16	0.86	
	LecOpi3	2.31	0.88	
	LecOpi4	2.23	0.93	
	LecOpi5	2.18	0.83	
	LecOpi6	2.25	0.90	
	LecOpi7	2.09	0.79	
	LecOpi8	2.26	0.93	
	LecOpi9	2.20	0.94	
Effects	ECom1	2.33	1.04	0.95
	ECom2	2.39	0.95	
	ECom3	2.42	1.03	
	ECom4	2.34	1.02	
	ECom5	2.48	0.94	
	ECom6	2.36	0.96	
	ECom7	2.37	0.95	
	ECom8	2.43	0.92	
	ECom9	2.41	0.95	
	ECom10	2.44	0.97	
	EEdu1	2.43	0.97	
	EEdu2	2.40	0.98	
	EEdu3	2.25	0.98	
	EEdu4	2.32	0.92	
	EEdu5	2.46	0.96	
	EEdu6	2.48	0.97	
	EEdu7	2.30	0.93	
	EEdu8	2.35	0.97	

	EEdu9	2.47	0.99	
	EEdu10	1.53	0.54	
	EOrg1	1.71	0.61	
	EOrg2	1.76	0.59	
	EOrg3	1.66	0.52	
	EOrg4	1.66	0.48	
	EOrg5	1.70	0.46	
	EOrg6	1.56	0.50	

Table 5.9 The mean, variance of each item used in ELMM's constructs and Cronbach's alpha (α) for each construct.

As shown in Table 5.9, all ELMM's constructs exhibit a high degree of internal consistency as evidenced by their α values which are greater than .70. Therefore, it was concluded that the scales items enjoy an acceptable level of reliability.

5.7.4 Confirmatory Factor Analysis Approach and Results

Once the scales were established via the EFA approach using the first part (n=100) of the overall sample and checked for internal consistency, the items comprising these scales and the factor structure uncovered by the EFA were subjected to a CFA using the second part of the overall sample (n=500). As this CFA step was intended to be purely confirmatory, the results were not intended to be subject to further changes based on the model specifications typically suggested in the results produced by most structural equation modelling packages (once model specification takes place following a CFA, the process effectively reverts to the exploratory phase; see Byrne, 2005). The present CFA was run using the AMOS 20 software package (Jöreskog & Sörbom, 2006). Before running a CFA, the scales of the model were set. There are a number of different (and under most circumstances, equally valid) ways to approach scale setting (Kline 2005). In the present analyses, the unit loading identification constraint which fixes the factor loading for the direct effect of one of each factor's indicators to 1.0,—was imposed. This is the most common approach to scale setting in CFA (Byrne 1998).

The following models fit indices will be reported:

1. Chi-square (x^2) is a test used to measure the level of relatedness between than more one categorical variable and a known distribution or the relatedness between two categorical variables (Kremelberg 2011). The model chi-square (x^2) with corresponding degrees of freedom and level of statistical significance are used here. A significant (x^2) value relative to the degree of freedom indicates that the observed and implied variance-covariance matrices differ. Statistical significance indicates the probability that this difference is due to sampling variation. A non-significant (x^2) value indicates that the two matrices are similar, indicating that the implied theoretical model significantly reproduces the sample variance –covariance relationships in the matrix (Schumacker and Lomax 2010).

2. The degree of freedom (df) of an estimate of a parameter is equal to the number of independent "pieces of information" that go into the estimate minus the number of parameters used as intermediate steps in the estimation of the parameter itself (Blunch 2012).
3. Chi-Square/df Ratio is a popular measure of model fit in structural equation modelling. Models with a chi-square/df ratio of less than five are considered to have a good model fit. The standers of less than two and less than three are also used but are more conservative (Kremelberg 2011).
4. The Root Mean Square Residual (RMR) represents the average residual value derived from the fitting of the variance–covariance matrix for the hypothesized model $\sum \theta$ to the variance–covariance matrix of the sample data (S).
5. The Goodness -of- Fit Index (GFI) is the degree to which a model is in agreement with the empirical data. The range of values for this tool of approximate fit index is generally 0–1.0 where 1.0 indicates the best fit. The Joreskog–Sorbom GFI is an absolute fit index that estimates the proportion of covariances in the sample data matrix explained by the model; i.e. the GFI estimates how much better the researcher's model fits compared with no model at all (Joreskog 2004). On the other hand, the Adjusted Goodness-of-Fit Index (AGFI) differs from the GFI only in the fact that it adjusts for the number of degrees of freedom in the specified model. Although both indices range from zero to 1.00, values close to 1.00 are indicative of good fit (Joreskog and Sorbom 1993).
6. Normed Fit Index (NFI): is a measure that rescales chi-square into a 0 (no fit) to 1.0 (perfect fit) range (Bentler & Bonettt 1980).
7. The Comparative Fit Index (CFI): is a popular measure of model fit in structural equation modelling. This measure ranges on a scale from 0 to 1. Models with a CFI of .9 or above are considered to have acceptable model fit, while models with scores of .95 or above are considered to have good model fit (Kremelberg 2011).
8. The Root Mean Square-Error of Approximation (RMSEA): is a popular measure of model fit in structural equation modelling. Model with RMSEA values of .05 or less are considered to have good model fit, while models with values of .05 to .08 are considered to have acceptable model fit. Models with RMSEA values of .08 to .10 are considered to have marginal fit or greater are considered to have poor model fit (Kremelberg 2011).

In large samples (i.e., over 200), the model chi-square statistic is nearly always statistically significant, thus, it is typically ignored in large samples (Kline 2005). The traditional cut-off criterion for acceptable fit using the RMSEA index remains under debate, and fit has been alternatively considered acceptable at levels at or below 0.08 (MacCallum, Browne, & Sugawara 1996), at or below 0.07 (Steiger 2007), and at or below 0.06 (Hu & Bentler 1999). Some have even suggested there should be no universal cut-off criterion for RMSEA fit (Chen, Curran, Bollen, Kirby, & Paxton 2008). With this uncertainty in mind, the preferred RMSEA in the present work will be at or below .06, with values between .06 and .08 viewed as acceptable but with room for improvement. The CFI and TFI fit indices each have a more generally accepted cut-off criterion at equal to or greater than .95 (Hu & Bentler 1999).

Next, the six measurement models are tested followed by fitting and validating the ELMM research model.

Model 1: Measurement Model of ELMM-Mo (Instructional Model for E-learning).

The measurement model of the construct ELMM-Mo (E-learning Maturity Model- Models or Instructional Models) is shown in Figure 5.4.

The model presented here, tests the hypothesis that the e-learning model (Instructional model for E-learning) is a three-factor structure comprising of a behaviourism (MBeh), cognitivism (MCog), and constructivism (MCon); it is presented schematically in Figure 5.4.

Before any discussion of how we might go about testing this model, let's take a few minutes to dissect the model and list its component parts as follows:

1. There are three e-learning model (Instructional model for E-learning) factors, as indicated by the three ellipses labeled behaviourism, cognitivism, and constructivism.
2. There are 15 observed variables, as indicated by the 15 rectangles (MBeh1–MBeh3); (MCog1–MCog3) and (MCon1–MCon9) which represent items from the Behaviourism, Cognitivism, and Constructivism subscales of the e-learning model (Instructional model for E-learning) questionnaire (see table 3.6).
3. The observed variables load on the factors in the following pattern: (MBeh1–MBeh3) load on Factor 1; (MCog1–MCog3) load on Factor 2, and (MCon1–MCon9) load on Factor 3.
4. Each observed variable loads on one, and only one, factor.
5. Errors of measurement associated with each observed variable are uncorrelated.

Moreover, Figure 5.4 shows three indicators for behaviourism, three indicators for cognitivism and nine indicators for constructivism proposed to measure the instructional model construct (ELMM-Mo) as a critical factor of e-learning deployment. Standardized factor loadings or standardized validity coefficiency are shown in this figure and indicate high validity.

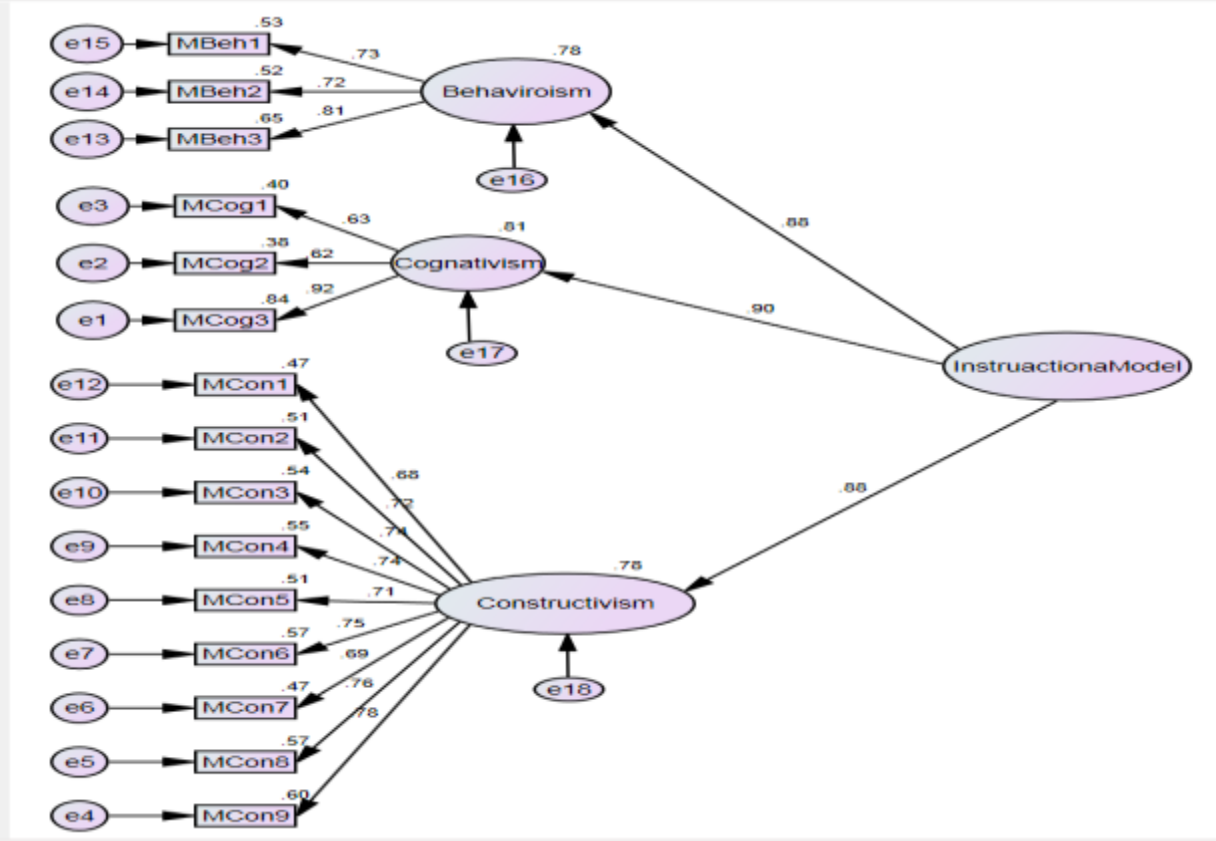


Figure 5.4 Measurement Model of ELMM-Mo

Figure5.4 shows the estimated path coefficients or standardized factor loading. All coefficients were significant at *p* value of .000, which indicated that the model did not need any modifications in order to be incorporated into the ELMM model.

The (ELMM-Mo) construct measurement model was tested and the measures of fit are displayed in the second column of Table 5.10. The model yielded a $\chi 2$ of 476.884 at 90 degrees of freedom (D.F) with a relative chi-square ($\chi 2$/d.f.) of 5.299. Other indices reflected an acceptable model (RMR = .128, RMSEA = .093; GFI = .884). All measures surpassed the minimum acceptable levels.

Model 2: Measurement Model of ELMM-Str(E-learning Strategies)

The measurement model of construct ELMM-Str (E-learning Maturity Model- strategies) is shown in Figure 5.5. It was tested and its fit measures were observed (given in Table 5.10).

The model presented here, test the hypothesis that ELMM-Str (E-learning strategies) is a five-factor structure comprising developing (SD), learning (SL), supporting (SS), organizing (SO), and evaluating (SE) factors; it is presented schematically in Figure 5.5.

Before any discussion of how we might go about testing this model, let's take a few minutes first to dissect the model and list its component parts as follows:

1. There are five ELMM-Str (E-learning strategies) factors, as indicated by the five ellipses labeled developing, learning, supporting, organizing, and evaluating.
2. There are 34observed variables, as indicated by the 34 rectangles (SD1–SD6), (SL1–SL10), (SS1–SS6), (SO1–SO8), and (SE1–SE3); they represent items from the Developing, Learning, Supporting, Organizing, and Evaluating subscales of the ELMM-Str (E-learning strategies) questionnaire for e-learning strategies (see table 3.8).
3. The observed variables load on the factors in the following pattern: (SD1–SD6) load on Factor 1; (SL1–SL10) load on Factor 2; (SS1–SS6) load on Factor 3; (SO1–SO8) load on Factor 4; and (SE1–SE3) load on Factor 5.
4. Each observed variable loads on one, and only one, factor.
5. Errors of measurement associated with each observed variable are uncorrelated.

Also, Figure 5.5 shows the six indicators for developing, ten for learning, six for supporting, nine for organizing and three for evaluating proposed to measure the e-learning strategies construct (ELMM-Str) as a critical factor of e-learning deployment.

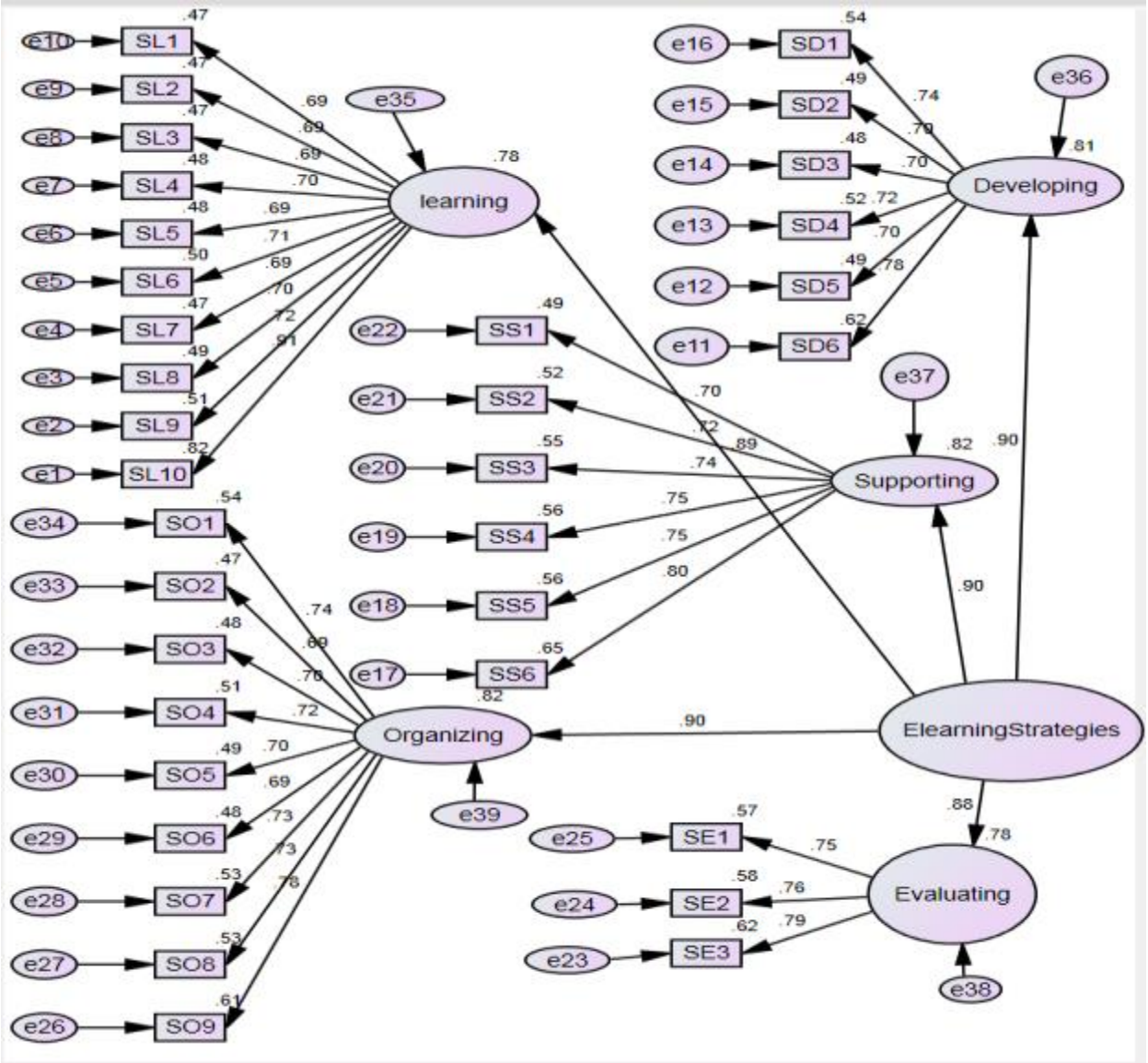


Figure 5.5 Measurement Model of ELMM-Str

Standardized factor loadings or standardized validity coefficiency are shown in Figure 5.5 indicating high validity. As compared to the recommended values, all fit measures surpassed the acceptable levels suggesting a good fit. All standardized factor loadings were significant at p = .000.

The (ELMM-Str) construct measurement model was tested and the measures of fit are displayed in the third column of Table 5.10. The model yielded a $\chi 2$ of 1890.551 at 528 degrees of freedom (D.F) with a relative chi-square ($\chi 2$/d.f.) of 3.581. Other indices reflected an acceptable model (RMR = .120, RMSEA = .072; GFI = .806; AGFI=.781; NFI=.825; CFI=.867). All measures surpassed the minimum acceptable levels.

Model 3: Measurement Model of ELMM-Fea (E-learning Features)

Figure 5.6 shows the five indicators for academic features and four indicators for organizational features proposed to measure the e-learning features construct (ELMM-Fea) as a critical factor of e-learning deployment.

The model presented here, tests the hypothesis that the measurement model of ELMM-Fea (E-learning Maturity Model- Features) is a two-factor structure comprising an academic features (SD) and organizational features (SE); it is presented schematically in Figure 5.6.

Before any discussion of how we might go about testing this model, let's take a few minutes first to dissect the model and list its component parts as follows:

1. There are two ELMM-Fea (E-learning Maturity Model- Features) factors, as indicated by the two ellipses labeled academic features and organizational features.
2. There are nine observed variables, as indicated by the nine rectangle; they represent items from the academic features and organizational features subscales of the measurement model of ELMM-Fea (E-learning Maturity Model- Features) questionnaire for e-learning features (see Table 3.9).
3. The observed variables load on the factors in the following pattern: (LS, AC, PE, OE, R) load on Factor 1 and (C, CC, GC, OA) load on Factor 2.
4. Each observed variable loads on one, and only one, factor.
5. Errors of measurement associated with each observed variable are uncorrelated.

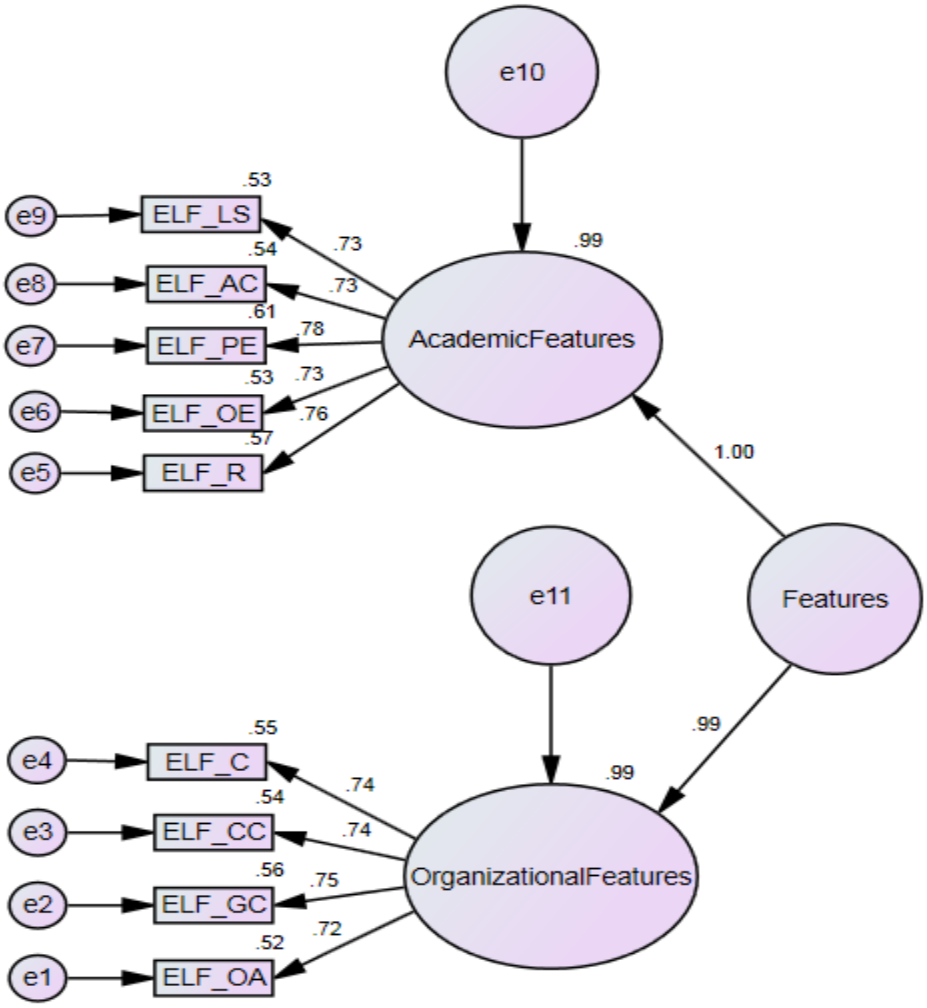


Figure 5.6 Measurement Model of ELMM-Features

Figure 5.6 shows the estimated standardized factor loadings that were significant at p=.000 and showed high validity of the measurement model. The fourth column of Table 5.10 shows its goodness-of-fit measures.

Standardized factor loadings or standardized validity coefficiency are shown in Figure 5.6 indicating high validity. Construct Features measurement model was examined and yielded a good model fit.

The (ELMM-Fea) construct measurement model was tested and the measures of fit are displayed in the fourth column of Table 5.10. The model yielded a χ2 of 63.474 at 27 degrees of freedom (D.F) with a relative chi-square (χ2/d.f.) of 2.351. Other indices reflected an acceptable model (RMR = .132, RMSEA = .052; GFI = .972; AGFI=.954; NFI=.970; CFI=.982). All measures surpassed the minimum acceptable levels.

Model 4: Measurement Model of ELMM-StuAtt (Students' Attitudes)

Figure 5.7 shows the five indicators for students' behaviour, five indicators for students' feelings, and eight indicators for students' opinions were proposed to measure the students' attitudes construct (ELMM-StuAtt) as a critical factor of e-learning deployment.

The model presented here tests the hypothesis that ELMM-StuAtt (E-learning Maturity Model- Students' Attitudes) is a three-factor structure comprising behaviour (SBeh), feelings (SFee) and opinions (SOpi); it is presented schematically in Figure 5.7.

Before any discussion of how we might go about testing this model, let's take a few minutes first to dissect the model and list its component parts as follows:

1. There are three ELMM-StuAtt (Students' Attitudes) factors, as indicated by the three ellipses labeled behaviour, feelings and opinions.
2. There are 18 observed variables, as indicated by the 18 rectangles; they represent items from behaviour, feelings and opinions subscales of the ELMM-StuAtt (Students' Attitudes) questionnaire for students' attitudes towards e-learning (see Table 3.4).
3. The observed variables load on the factors in the following pattern: (SBeh1- SBeh5) load on Factor 1; (SFee1- SFee5) load on Factor 2; and (SOpi1- SOpi8) load on Factor 3.
4. Each observed variable loads on one, and only one factor.
5. Errors of measurement associated with each observed variable are uncorrelated.

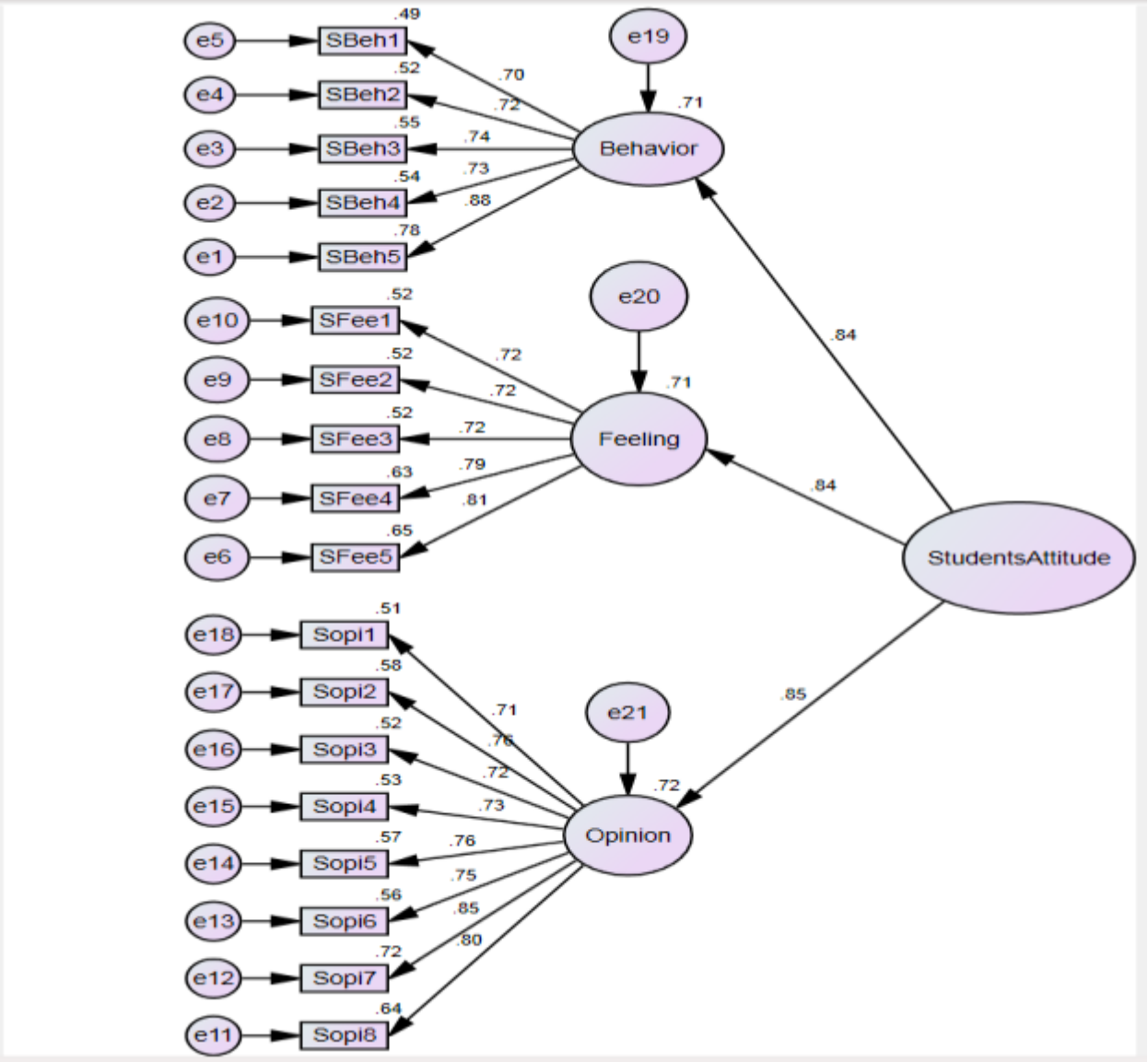


Figure 5.7 Measurement Model of ELMM-StuAtt

Standardized factor loadings or standardized validity coefficiency are shown in Figure 5.7 indicating high validity.

Construct StuAtt (Students' Attitudes towards e-learning) measurement model is shown in Figure 5.7 and its fit measures are given in fourth column of Table 5.10 indicating excellent model fit.

The (ELMM-StuAtt) construct measurement model was tested and the measures of fit are displayed in the fifth column of Table 5.10. The model yielded a $\chi 2$ of 806.895 at 137degrees of freedom (D.F) with a relative chi-square ($\chi 2$/d.f.) of 5.890. Other indices reflected an acceptable model (RMR = .174, RMSEA = .099; GFI = .867; AGFI=.834; NFI=.839; CFI=.862). All measures surpassed the minimum acceptable levels.

Model 5: Measurement model of ELMM-LecAtt (Lectures' Attitudes).

Figure 5.8 shows the three indicators for lecturers' behaviour, three indicators for lecturers' feelings, and seven indicators for lecturers' opinions proposed to measure the lecturers' attitudes construct (ELMM-LecAtt) as a critical factor of e-learning deployment.

The model presented here tests the hypothesis that ELMM-LecAtt (E-learning Maturity Model- Lectures' Attitudes) is a three-factor structure comprising behaviour (LBeh), feelings (LFee) and opinions (LOpi); it is presented schematically in Figure 5.8.

Before any discussion of how we might go about testing this model, let's take a few minutes first to dissect the model and list its component parts as follows:

1. There are three ELMM-LecAtt (Lectures' Attitudes) factors, as indicated by the three ellipses labeled behaviour, feelings and opinions.
2. There are 15 observed variables, as indicated by the 15 rectangles; they represent items from behaviour, feelings and opinions subscales of the ELMM-LecAtt (Lecturers' Attitudes) questionnaire for university attitude towards e-learning (see Table 3.7).
3. The observed variables load on the factors in the following pattern: (LFee1- LFee3) load on Factor 1; (LBeh1- LBeh3) load on Factor 2; and (LOpi1- LOpi9) load on Factor 3.
4. Each observed variable loads on one, and only one, factor.
5. Errors of measurement associated with each observed variable are uncorrelated.

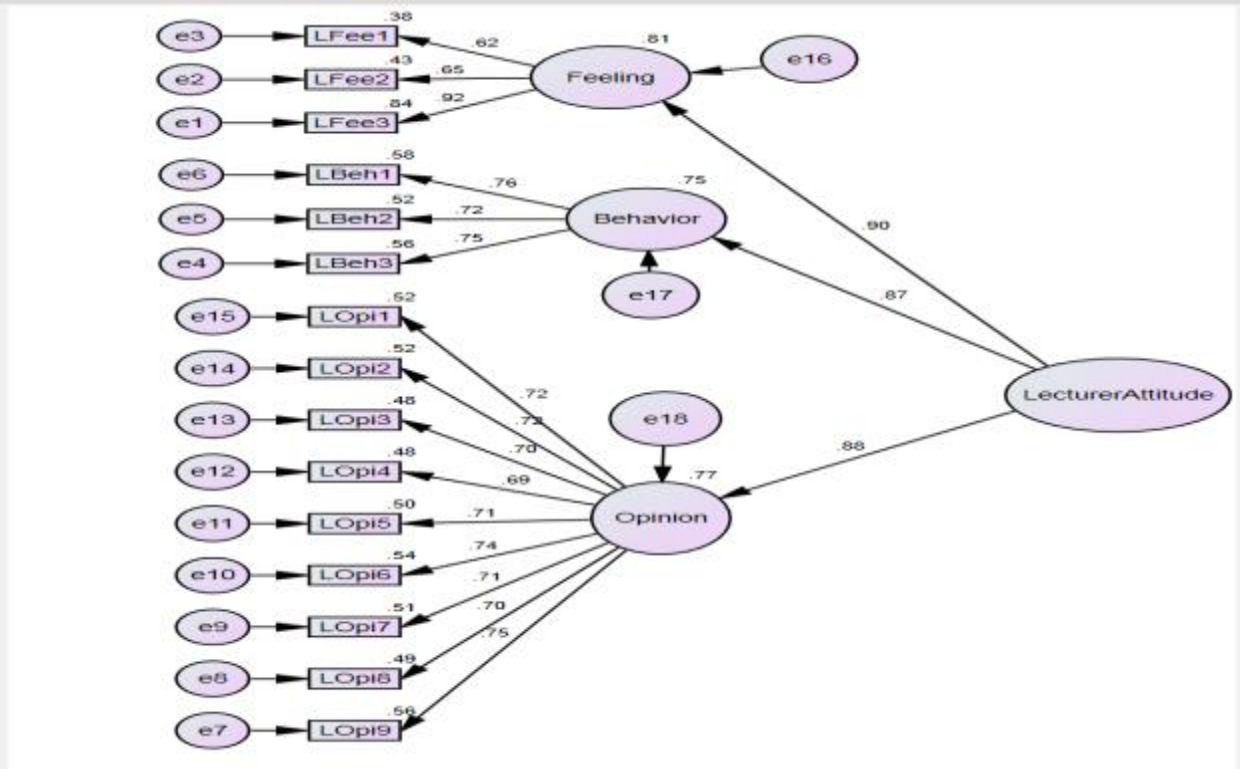


Figure 5.8 Measurement Model of ELMM-LecAtt

Construct LecAtt (lecturers' Attitudes towards e-learning) measurement model is shown in Figure 5.8 and its fit measures are given in the sixth column of Table 5.10 indicating excellent model fit. Standardized factor loadings or standardized validity coefficiency are shown in Figure 5.8 indicating high validity.

The (ELMM-LecAtt) construct measurement model was tested and the measures of fit are displayed in the sixth column of Table 5.10. The model yielded a $\chi 2$ of 346.872 at 90 degrees of freedom (D.F) with a relative chi-square ($\chi 2$/d.f.) of 4.854. Other indices reflected an acceptable model (RMR = .124, RMSEA = .088; GFI = .892; AGFI=.856; NFI=.885; CFI=.906). All measures surpassed the minimum acceptable levels.

Model 6: Measurement Model of ELMM-Eff (E-learning Effects).

Figure 5.9 shows the ten indicators for communications effects, ten indicators for educational effects, and six indicators for organizational effects proposed to measure the e-learning effects (ELMM-Eff) as a critical factor of e-learning deployment.

The model presented here tests the hypothesis that ELMM-Eff (E-learning Maturity Model-Effects) is a three-factor structure comprising communications effects (ECom), educational effects (EEdu), and organizational effects (EOrg); it is presented schematically in Figure 5.9.

Before any discussion of how we might go about testing this model, let’s take a few minutes first to dissect the model and list its component parts as follows:

1. There are three ELMM-Eff (E-learning Effects) factors, as indicated by the three ellipses labelled communications, educational, and organizational effects.
2. There are 26 observed variables, as indicated by the 26 rectangles (ECom1– ECom10), (EEdu1 – EEdu10), and (EOrg1– EOrg6); they represent items from the communications effects, educational effects, organizational effects subscales of the ELMM-Eff (E-learning Effects) questionnaire for e-learning effects (see table 3.5).
3. The observed variables load on the factors in the following pattern (ECom1– ECom10) load on Factor 1; (EEdu1 – EEdu10) load on Factor 2; and (EOrg1– EOrg6) load on Factor 3.
4. Each observed variable loads on one, and only one, factor.
5. Errors of measurement associated with each observed variable are uncorrelated.

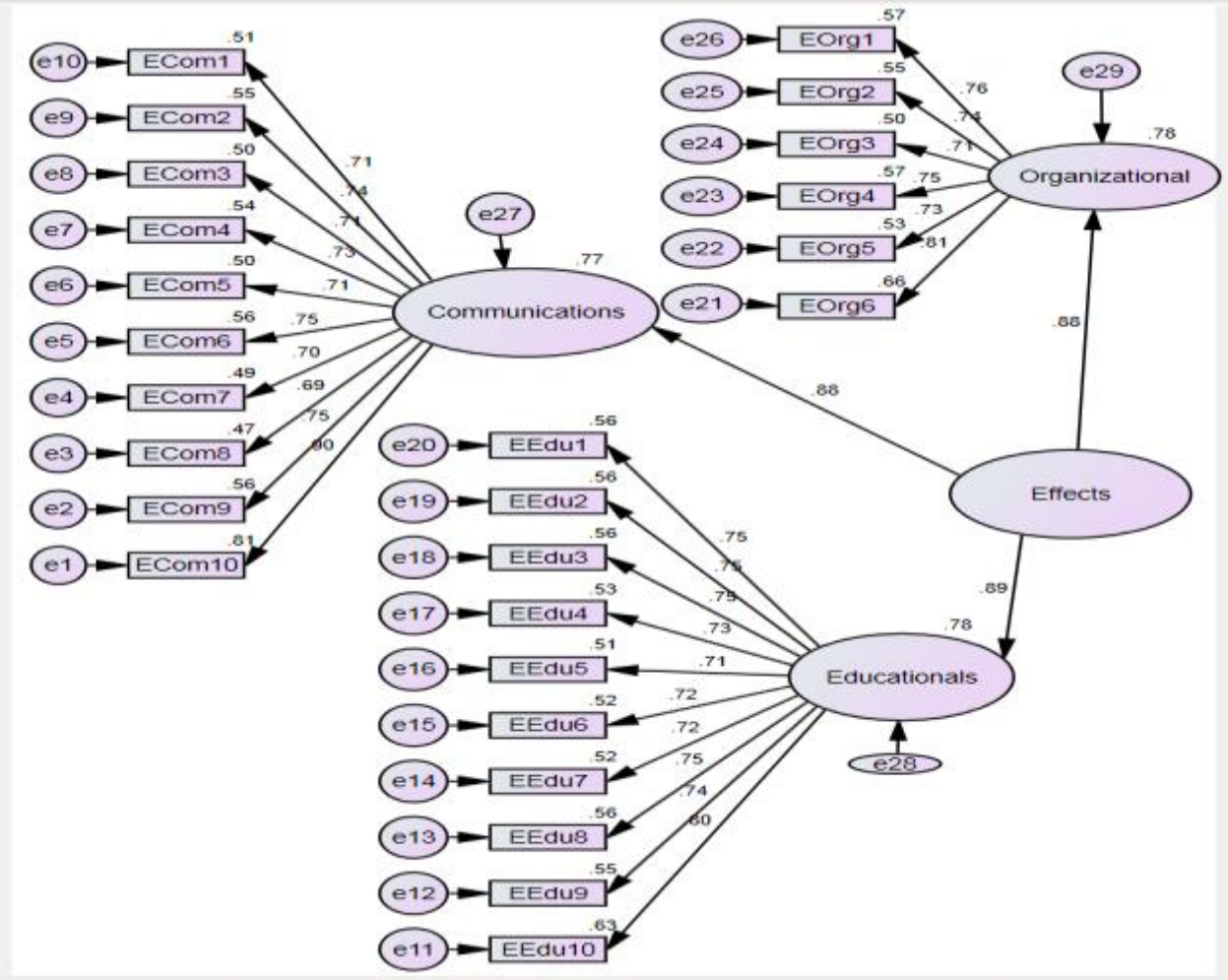


Figure 5.9 Measurement Model of ELMM-Effects

Standardized factor loadings or standardized validity coefficiency are shown in Figure 5.9 indicating high validity.

Construct EFFECTS measurement model was examined and yielded a good model fit.

Figure 5.9 shows the estimated standardized factor loadings that were significant at *p*=.000 and showed high validity of the measurement model.

The (ELMM-Eff) construct measurement model was tested and the measures of fit are displayed in the seventh column of Table 5.10. The model yielded a $\chi 2$ of 1367.944 at 300 degrees of freedom (D.F) with a relative chi-square ($\chi 2$/d.f.) of 4.560. Other indices reflected an acceptable model (RMR = .141, RMSEA = .084; GFI = .830; AGFI=.801; NFI=.830; CFI=.862). All measures surpassed the minimum acceptable levels. The seventh column of Table 5.8 shows its goodness-of-fit measures.

Fit Measure	ELMM-Mo	ELMM-Str	ELMM-Fea	StuAtt	LecAtt	Eff
Chi-square ($\chi 2$)	476.884	1890.551	63.474	806.895	346.872	1367.944
Degree of freedom	90	528	27	137	90	300
$\chi 2$/Degree of freedom (DF)	5.299	3.581	2.351	5.890	4.854	4.560
RMR	.128	.120	.132	.174	.124	.141
GFI	.884	.806	.972	.867	.892	.830
AGFI	.845	.781	.954	.834	.856	.801
NFI	.883	.825	.970	.839	.885	.830
CFI	.902	.867	.982	.862	.906	.862
(RMSEA)	.093	.072	.052	.099	.088	.084

Table 5.10 Fit measures for Model, Strategy, Feature, StuAtt, LecAtt, Effects, Vision and Consequences

The CFA results confirmed the proposed six constructs and they can be used in testing and validating ELMM with high validity and acceptable fit measures as given in Table 5.10.

5.8. Test of the Proposed Model

The six measurement models (tested and validated in the previous sub-section) were linked, forming the proposed ELMM research model through phase1 and phase2 (illustrated in Figures 5.10 and 5.11). ELMM was tested using SEM as performed in AMOS version 20. The objectives were to test the twenty five hypotheses and ELMM research model fit. The ELMM model was evaluated for its validity using exploratory factor analysis and KMO method, because all the scale items were ordinal (Jaakkola 1996; Joreskog & Sorbom 1996; Joreskog et al. 2000).

The ELMM first phase presented here tests the hypothesis that ELMM-Phase one (E-learning Vision) is a three-factor structure comprising E-learning Models (ELMM-Mo), E-learning Strategies (ELMM-Str) and E-learning Features (ELMM-Fea); it is presented schematically in Figure 5.10.

Before any discussion of how we might go about testing this model, let's take a few minutes first to dissect the model and list its component parts as follows:

1. There are three E-learning Vision factors, as indicated by the three ellipses labeled Models, Strategies and Features.
2. There are 58 observed variables, as indicated by the 58 rectangle; they represent items from Models, Strategies and Features subscales of the e-learning vision.
3. Each observed variable loads on one, and only one, factor.
4. Errors of measurement associated with each observed variable are uncorrelated.

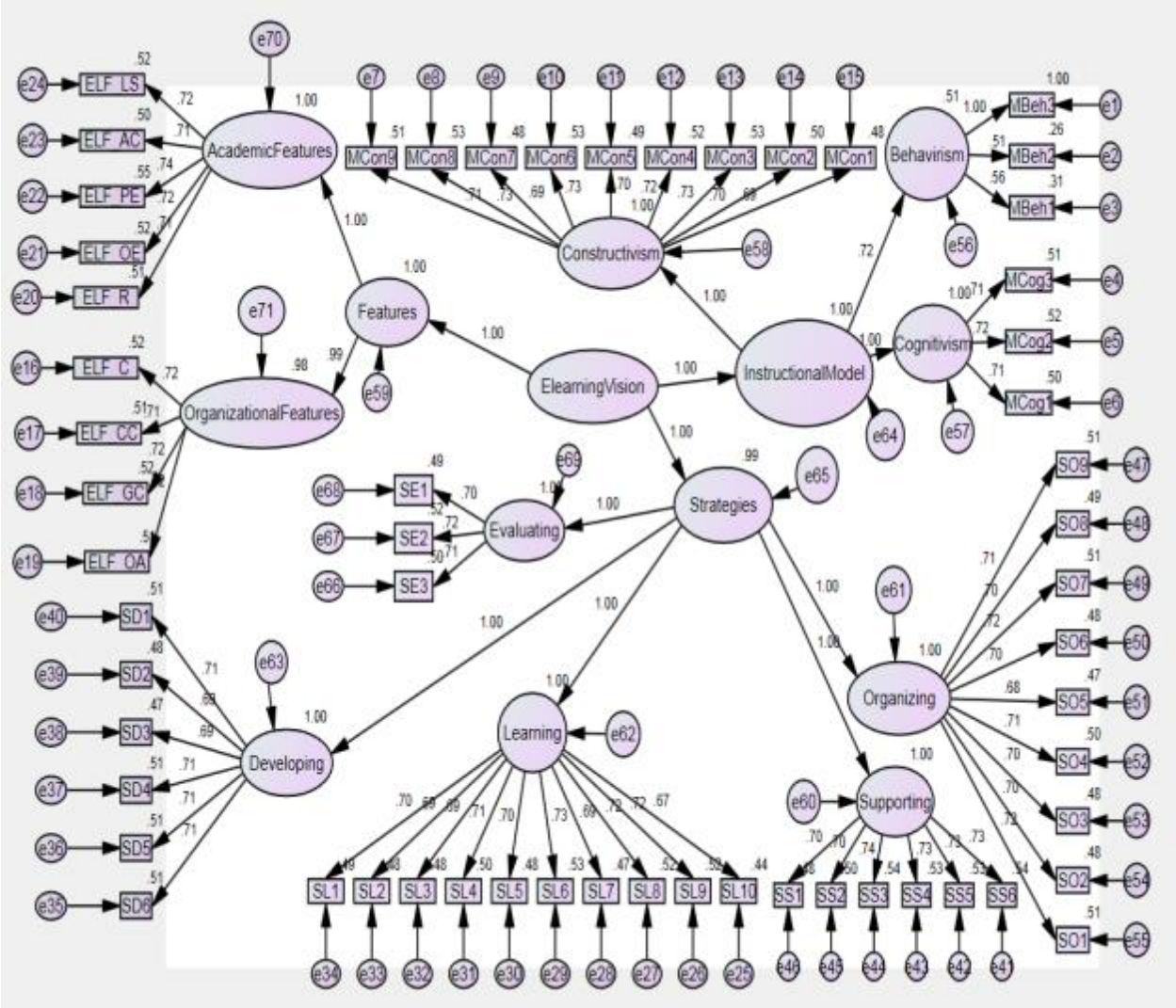


Figure 5.10 Confirmatory Factor Analysis of the E-learning Vision.

On the other hand, the ELMM second phase presented here tests the hypothesis that ELMM-Phase Two (Consequences of E-learning Vision) is a three-factor structure comprising Students' attitudes towards e-learning (ELMM-StuAtt), Lecturers' attitudes towards e-learning (ELMM-LecAtt) and Effects of e-learning (ELMM-Eff); it is presented schematically in Figure 5.11.

Before any discussion of how we might go about testing this model, let's take a few minutes first to dissect the model and list its component parts as follows:

1. There are three Consequences factors, as indicated by the three ellipses labelled Students' Attitudes, Lecturers' Attitudes and Effects.
2. There are 59 observed variables, as indicated by the 59 rectangle; they represent items from Students' Attitudes, Lecturers' Attitudes and Effects subscales of the Consequences of E-learning vision.
3. Each observed variable loads on one, and only one, factor.

4.Errors of measurement associated with each observed variable are uncorrelated.

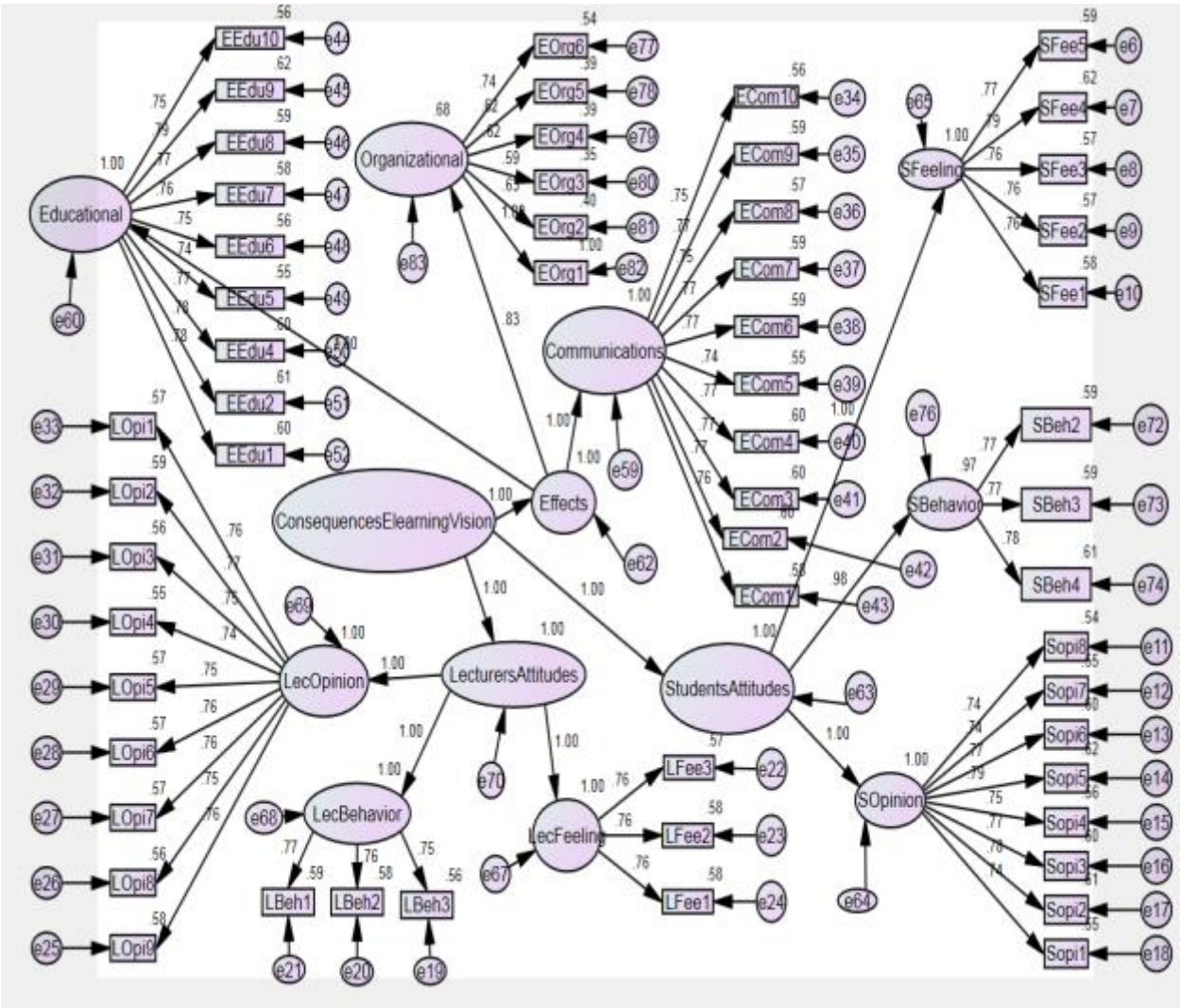


Figure 5.11 Confirmatory Factor Analysis of the Consequences of E-learning Vision.

A summary of the model's goodness-of-fit measures are given in the second and third columns of Table 5.11. The relative chi-square (χ2/d.f.) was 1.841 and 2.281, which was below the desired value of 3.0. The GFI and AGFI values were .834 and .821for e-learning vision and .794 and .778 for consequences respectively, indicating a good fit. Further, RMR (.097), NFI (.858), CFI (.930), and RMSEA (.041) for e-learning vision were all within the acceptable levels. Also, RMR (.281), NFI (.829), CFI (.896), and RMSEA (.051) for consequences E-learning vision were all within the acceptable levels.

Fit Measure	E-learning Vision	Consequences of E-learning Vision
Chi-square ($\chi 2$)	2931.590	3386.632
Degree of freedom	1592	1485
$\chi 2$/Degree of freedom (DF)	1.841	2.281
RMR	.079	.281
GFI	.834	.794
AGFI	.821	.778
NFI	.858	.829
CFI	.930	.896
(RMSEA)	.041	.051

Table 5.11 Fit measures for Vision and Consequences

The standardized path parameters and the corresponding regression weights values of the ELMM research model appear in Figures 5.10, 5.11 and Table 5.12, as reported by AMOS. The ELMM research in the first stage showed that E-learning Model (ELMM-Mo), E-learning Strategies (ELMM-Str), and E-learning Features (ELMM-Fea) were significantly influenced by the e-learning vision. Moreover, The ELMM research in the second stage showed that Students' Attitudes (ELMM-StuAtt), Lecturers' Attitudes (ELMM-LecAtt), and Effects of e-learning (ELMM-Eff) were significantly influenced by the Consequences of e-learning vision.

Figures 5.10 and 5.11 show the resulting path regression coefficients of the proposed research model for the E-learning Vision and Consequences of E-learning Vision respectively.

To explore the relationships between variables, the research assembled data on the underlying factors and employs regression to estimate the quantitative effect of the causal variables upon the variable that they influence. For that reason multiple regression was used in this research as a technique that allows additional factors to enter the analysis separately so that the `effect of each can be estimated. This is valuable for quantifying the impact of various simultaneous influences upon a single dependent variable (Alan 1992). Thus, all hypotheses were supported by the data.

The results show that Behaviourism, Cognitivist and Constructivism were significantly influenced by E-learning Models and E-learning Models was significantly influenced be E-learning Vision which supporting hypothesis H1a, H1b, H1c and H4a respectively. Organizing, Supporting, Learning, Developing and Evaluating were influenced by E-learning Strategy, and it was influenced by E-learning Vision, supporting hypotheses H2a, H2b, H2c, H2d, H2e and H4b. Organizational and Academic Features were found to be influenced by E-learning Features, and this was influenced by E-learning Vision, thus supporting hypotheses H3a, H3b and H4c. In the second phase (Consequences of E-learning Vision), Students' Behaviours, Feelings and Opinions

were influenced by students' attitudes and students' attitudes were influenced by consequences of E-learning Vision, thus supporting hypotheses H5a, H5b, H5c and H8a. Lecturers' Behaviours, Feelings and Opinions were influenced by Lectures' attitudes and Lecturers' attitudes were influenced by consequences of E-learning Vision, thus supporting hypotheses H6a, H6b, H6c and H8b. Also, Communications, Educational and Organizational were influenced by Effects of E-learning and these effects were influenced by consequences of E-learning Vision, thus supporting hypotheses H7a, H7b, H7c and H8c.

The standardized path parameters of the ELMM appear in Table 5.12, Figure 5.10 and 5.11, as reported by AMOS. The ELMM showed that readiness and reliability of the e-learning strategies (ELMM-Str), e-learning features (ELMM-Fea), and e-learning models (ELMM-Mo) were significantly influenced by e-learning vision.

As illustrated in Figure 5.10, 5.11 and Table 5.12, all the direct paths between the construct pairs were significant. The readiness and reliability of the e-learning vision had significant direct impacts on e-learning strategies, features and e-learning models. The direct effect of e-learning vision on strategies, models, and features were 1, with a regression coefficient (β) 1. Therefore, hypotheses H4a, H1a, H1b, H1c, H4b, H2a, H2b, H2c, H2d, H2e, H4c, H3a, and H3b were supported, which means that e-learning strategies, features and models are significantly affected by the e-learning vision.

The consequences of e-learning have significant direct impacts on the attitude of both learners and instructors toward e-learning, and effects of e-learning. The direct effect of the consequences e-learning vision on attitudes and effects of e-learning vision were 1 with a regression coefficient (β) 1. Therefore, hypotheses H8a, H5a, H5b, H5c, H8b, H6a, H6b, H6c, H8c, H7a, H7b, H7c, and H3b were supported, which means that the attitude of both learners and instructors toward e-learning, and effects of e-learning are significantly affected by the consequences of e-learning vision.

Hypothesis	Path	regression coefficients	Direct	Resulted
H1a	E-learning Models→ Behaviourism	.72	1	Supported
H1b	E-learning Models→ Cognitivist	1	1	Supported
H1c	E-learning Models→ Constructivism	1	1	Supported
H2a	E-learning Strategies→ Organizing	1	1	Supported
H2b	E-learning Strategies→ Supporting	1	1	Supported
H2c	E-learning Strategies→ Learning	1	1	Supported
H2d	E-learning Strategies→ developing	1	1	Supported
H2e	E-learning Strategies→ Evaluating	1	1	Supported
H3a	E-learning Features→	1	1	Supported

	Academic Features			
H3b	E-learning Features→ Organizational Features	.99	.997	Supported
H4a	E-learning Vision → E-learning Models	1	.883	Supported
H4b	E-learning Vision → E-learning Strategies	1	.776	Supported
H4c	E-learning Vision → E-learning Features	1	.870	Supported
H5a	Students' Attitudes→ Behaviour	.98	1	Supported
H5b	Students' Attitudes→ Opinion	1	1	Supported
H5c	Students' Attitudes→ Feeling	1	1	Supported
H6a	Lecturers' Attitudes→ Behaviour	1	.955	Supported
H6b	Lecturers' Attitudes→ Opinion	1	1	Supported
H6c	Lecturers' Attitudes→ Feeling	1	.988	Supported
H7a	E-learning Effects→ Communications	1	1	Supported
H7b	E-learning Effects→ Educational	1	1	Supported
H7c	E-learning Effects→ Organizational	.83	1	Supported
H8a	Consequences of E-learning Vision → Students' Attitudes	1	.947	Supported
H8b	Consequences of E-learning Vision → Lecturers' Attitudes	1	1	Supported
H8c	Consequences of E-learning Vision → E-learning Effects	1	1	Supported

Table 5.12 Direct, indirect, and total effects on constructs.

5.9. Summary

The ELMM SEM provided a good fit to the data. All path coefficients were found to be significant. In the first phase, the e-learning vision incorporated the e-learning strategies, instructional models, and features of e-learning. The results showed that e-learning strategies were highly affected by developing, supporting, evaluating, organizing and learning strategies. Also, the features of e-learning included academic and organizational features. Thus, we cannot adopt e-learning without a clear vision for it. Lack of e-learning strategies, instructional models, and features can hinder the deployment of e-learning technologies and affect the attitude of both learners and instructors toward e-learning.

In the second phase, the consequences of e-learning vision incorporated the students' and instructors' attitudes toward e-learning, and the effects of e-learning. The instructor and student's attitudes included behaviours, feelings, and opinions toward using e-learning units in classrooms. For that reason, the results of testing the ELMM showed that attitudes towards e-learning were highly dependent on behaviours, opinions and feelings. Thus in the future, we cannot analyze

attitude with isolation of its components. Moreover, the effects of e-learning components included communications, educational, and organizational. It is worth mentioning that these effects cannot be achieved without a successful vision for e-learning.

The next chapter presents the research findings and explains how the research methodology, and the methods of investigation were linked to generate data that would answer the two questions that guided the study.

Chapter Six Discussion

6.1. Introduction

This chapter begins by examining what the research has achieved and compares these achievements with the stated aims and objectives of the thesis. Following this, a discussion is provided with regard to the feasibility of implementing the ELMM, outlining the priorities involved with instructional model implementation, with a particular focus on e-learning features, measuring student and staff attitudes towards e-learning and evaluating e-learning effects in the Middle East.

6.2. Achievement of Research Aims and Objectives

This thesis explored the e-learning Maturity Model (ELMM) from the perspectives of students and faculty members at Middle Eastern universities. In the first phase, ELMM consisted of the e-learning strategies, features and models which are called the e-learning vision. Also, in the second phase this ELMM explained the consequences of the e-learning vision which consists of students and instructors attitudes towards e-learning and its effects.

Figure 6.1 and 6.2 shows a conceptual map of the theory which has been explored in this thesis.

Figure 6.1 provides an overview of the theory design using a series of connected ellipses. The name of the first phase (E-learning Vision) is stated at the central of the map (Figure 6.1) and leads to the hypotheses arrows. Emanating from the E-learning Vision are the three factors, which help prove the theory. These factors are Models, Strategies and Features, and are displayed from the E-learning Vision in the centre of the figure. Each group of underlying factors employed was designed to inform one factor; for example, Academical and Organizational features were designed to explore E-learning Features. Also, figure 6.1 displays the original hypothesis that first phase of ELMM (E-learning Vision) is a three-factor structure comprising an E-learning Models (ELMM-Mo), E-learning Features (ELMM-Fea), and E-learning Strategies (ELMM-Str).

Figure 6.2 provides an overview of ELMM second phase. The name of the second phase (Consequences of E-learning Vision) is stated at the centre of the map (Figure 6.2) and lead to the hypotheses arrows. Emanating from the Consequences of E-learning Vision are the three factors, which help prove the second half of theory. These factors are Students' Attitudes, Lecturers' Attitudes and Effects of E-learning, and are displayed from the Consequences in the centre of the figure. Each group of the underlying factors employed was designed to inform one factor; for example, Behaviour, Opinion and Feeling were designed to explore Students' Attitudes. Also, figure 6.2 displays the original hypothesis where the second phase of ELMM (Consequences of E-learning Vision) is a three-factor structure comprising Students' Attitudes (ELMM-StuAtt), Lecturers' Attitudes (ELMM-LecAtt), and Effects of E-learning (ELMM-Eff).

The aim of Figure 6.1 and 6.2 is to provide the reader with an overview of the ELMM design and facilitate an understanding of the theory structure.

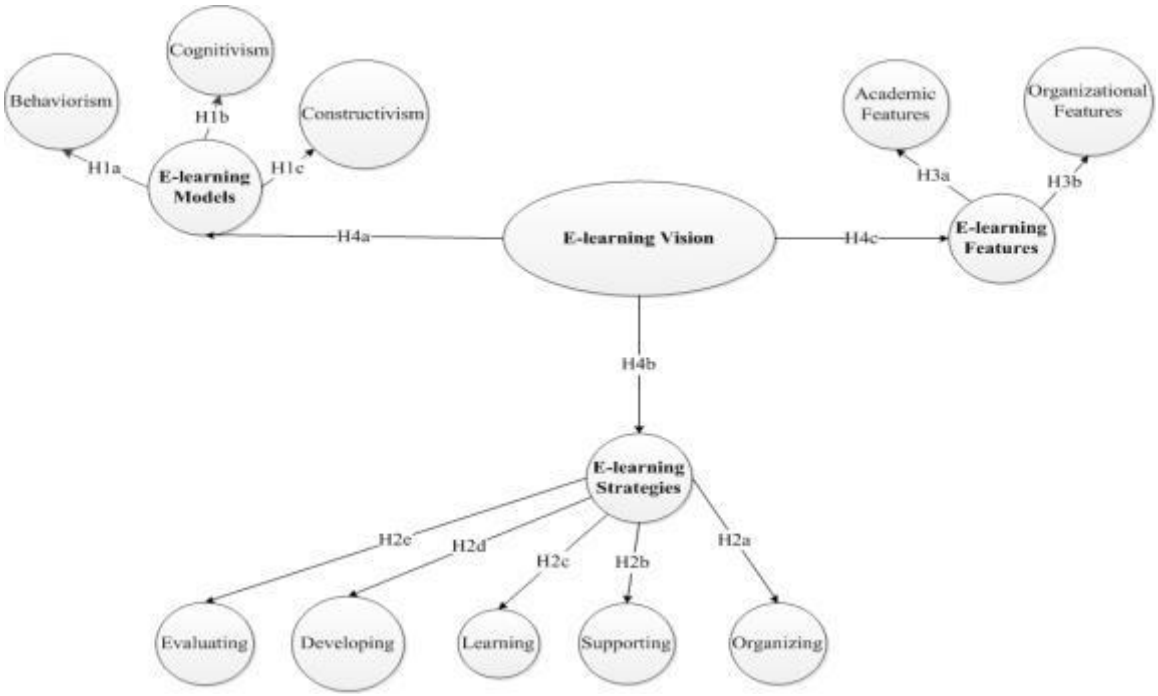


Figure 6.1 ELMM Phase 1

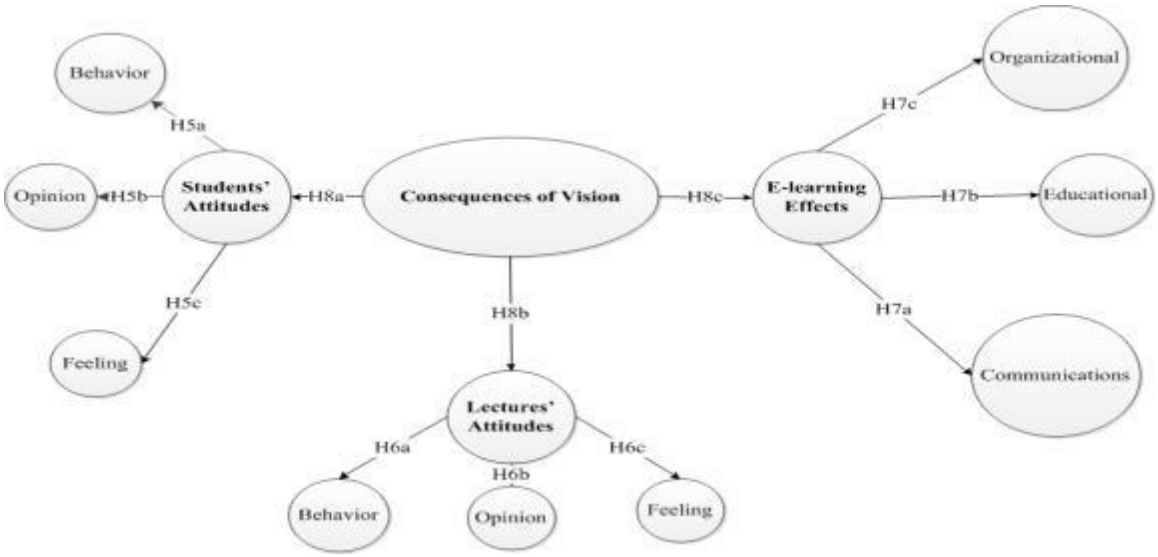


Figure 6.2 ELMM Phase 2

As stated in Chapter 1 the research asks two main questions:

Research Question 1: What are the criteria affecting the introduction of the maturity model in the deployment of e-learning in Middle Eastern countries?

Research Question 2: *To what extent could these criteria measure maturity level in e-learning?*

In order to find the answers to these research questions, the following objectives needed to be attained:

1. Evaluate the current status of e-learning in Middle Eastern Universities.
2. Identify factors that affect the application and deployment of e-learning in the Middle East.
3. Analyze the factors affecting implementation of e-learning and assess their relative strength on e-learning deployment.
4. Provide guidelines to support effective implementation of e-learning in the Middle East.

The research questions, aims and objectives were addressed through several phases. The beginning stage of research was mainly theoretical as it was based on reviewing literature resources and secondary data. The review informed that there are a group of factors deemed critical for the successful deployment of e-learning. However this stage was not enough to know whether or not these factors are applicable for Middle Eastern universities. For that reason, the second stage started. This was Grounded Theory and it was designed to investigate the dimensions that formed ELMM at Middle Eastern universities. One hundred and fifty in-depth interviews were conducted, and the Grounded Theory method was utilized to analyze the in-depth interview data.

Grounded Theory informed the framework which had affected the introduction of the maturity model in the deployment of e-learning in Middle Eastern countries. The framework helped in building a comprehensive background of Middle Eastern readiness for e-learning. Also, it has helped identifying the factors that formulate ELMM in Middle Eastern universities. This enabled answering the first research question through the identification of the factors which might affect the deployment of e-learning in Middle Eastern countries. The literature review, along with the construction of the framework resulted from Grounded Theory, also enabled the achievement of the first and second objectives of the research, as they provided a clear picture of the current state of e-learning readiness in the Middle East.

The second question posed by the research was to what extent could these criteria measure maturity level in e-learning. This question was answered through the data collected in the field survey. The data was collected through both qualitative and quantitative data collection techniques. It included the use of semi-structured interviews and questionnaires. The data informed how the students and staff see the maturity model for e-learning. The process of analyzing these data included exploring, testing and confirming the ELMM existence, and the importance and influence on e-learning deployment in the Middle East (Objective 3). The analysis identified the existence of the ELMM factors and how they affect e-leaning deployment in the Middle East.

The identification of the issues involved in e-learning deployment in higher education in the Middle East through the field survey allowed and helped in suggesting dimensions for how to increase the maturity level of e-learning in higher education. These dimensions or factors were introduced in the form of a maturity model to improve e-learning deployment, implementation and development in higher education in Middle East (Objective 4).

Figure 6.3 shows a conceptual map of the methodology used in this research. The map provides an overview of the study design using a series of interrelated blocks. The questions of the research are stated at the top of the map and lead into the methodology block. Emanating from the methodology block is the type of research methodology, which helped inform the study, and the research strategy and methods of inquiry blocks. The research questions are displayed above the centre of the map. Each of the methods employed was designed to inform one or more of the research questions. The left-hand side of the map shows the qualitative methods used to research the questions, whilst the right-hand side displays the quantitative methods. The question, or questions, that each method was designed to inform are shown in the blocks displayed between the relevant method and the research questions, thus showing a pathway between the research questions and the possible sources of evidence.

The aim of this map is to provide the reader with an overview of the exploratory design and facilitate an understanding of the methodology used in this thesis.

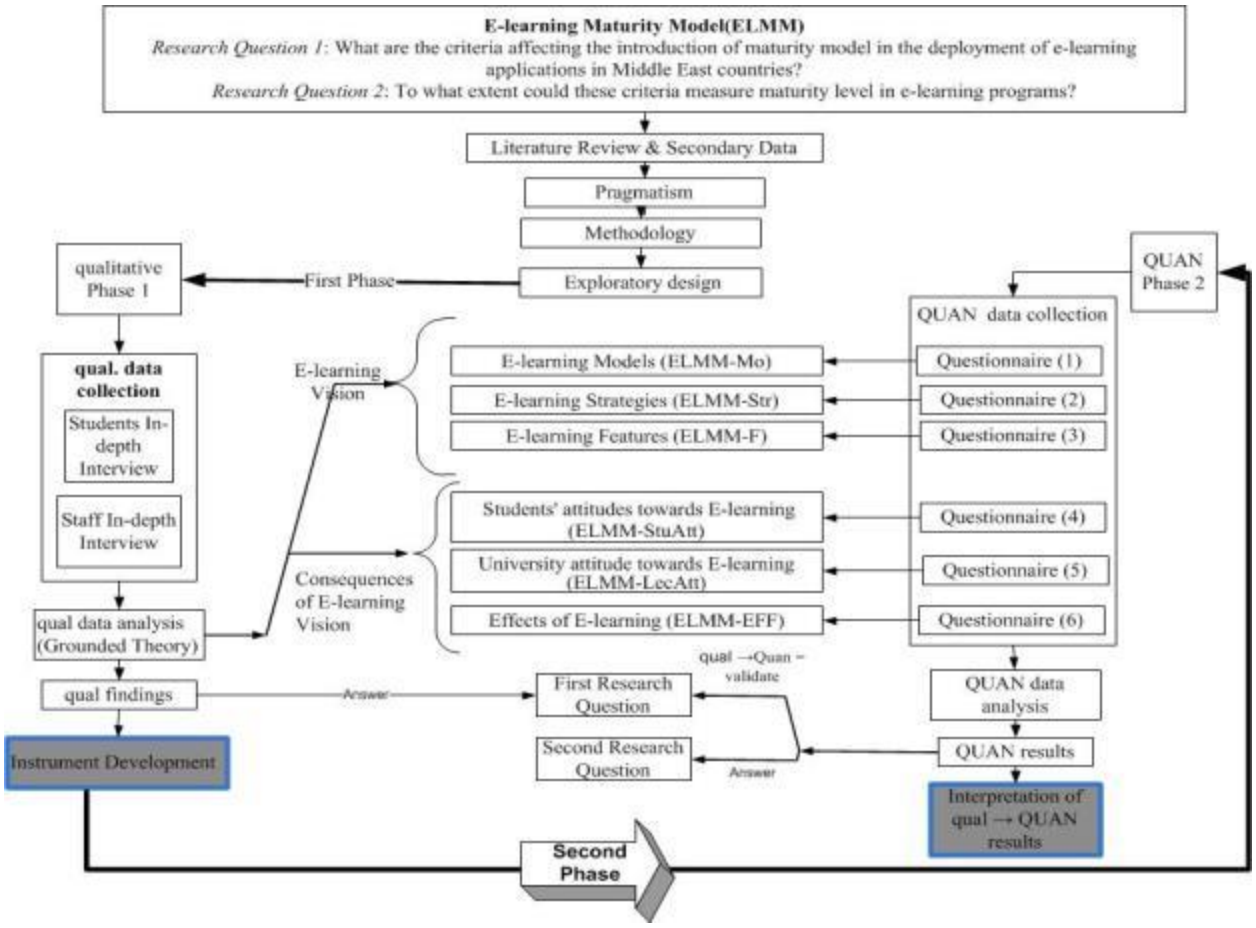


Figure 6.3 Conceptual Map of Research Methodology

The conceptual map in Figure 6.3 provides an overview of the design of the study. It is presented as a foldout sheet so that the reader may use it as a point of reference throughout this thesis.

The next section discusses how this model could be used.

6.3. Recommendations for Institutions of Higher Education

The deliverable of this research was a model to improve the deployment of e-learning in Middle Eastern countries. In order for this model to be implemented, a set of procedures needs to be conducted. This section focuses on these procedures, and includes what is intended to be done to promote this model and put it into action.

The research suggested that a model to improve e-learning deployment might not get proper attention unless certain steps and procedures are conducted. Therefore, it is very important to raise the coordination between e-learning models, strategies and features at Middle Eastern universities. Also, the e-learning strategies need to be distributed between evaluating, developing, learning, supporting and organizing. This could be achieved most expediently through designing an instructional model for e-learning mainly depending on constructivism theory cooperating with behaviourism and cognitivism. In addition to all strategies and instructional models for e-learning, deployment and implementation of e-learning will be significantly enhanced by integration with e-learning features, which need to be divided between organizational and academic features.

In the next section the new theory for e-learning (ELMM) will be explained through the use of two phases.

6.3.1. Phase 1

The procedures suggested that ELMM should begin with Phase 1, this phase includes:

- Strategies;
- Instructional models;
- E-learning features.

The e-learning strategies include the basic reasons or policies for implementing e-learning in the university. Moreover, these strategies should be achieved by five factors: organizing, learning, supporting, developing and evaluating. For example, the learning material should be divided to avoid cognitive excess, students and lecturers need to be supported when they are engaging in e-learning, online learning materials should include activities for the different learning and learning theories, and each semester all polices should be evaluated from students' and lecturers' perspective. In the same context, for Middle Eastern universities interested in enhancing their students' learning experience by increasing the use of cooperative learning (Communication component, e-calendar and etc.), it may be useful to promote the use of these interactive features during lectures and to optimize their use by developing group-based tasks that will require students to collaborate more closely with members of their team. Addressing the factors underlying e-learning vision (Strategies-Instructional Models-Features) will have a direct effect on the students' and lecturers' attitudes towards e-learning and its effects.

6.3.2. Phase 2

Phase 2 focuses on the consequences of e-learning vision. This phase includes underlying factors such as:

- Students' attitudes towards e-learning;
- Lecturers' attitudes towards e-learning;
- Effects of e-learning.

The relationship between the larger selective categories provided the Grounded Theory that emerged during this study concerning the readiness level of e-learning in the Middle East. The participants reported feeling unprepared for e-learning. They stated that their universities had not prepared them for self-learning skills. Several students reported that they may have chosen to use e-learning because of instructor's desire for them to use it. The participants also related being distracted from e-learning goals. The participants found it difficult to balance their traditional learning and e-learning, and reported that it was difficult to establish friendships through e-learning. The participants related that some of their expectations about e-learning were not met. Some participants also related that they did not receive enough information or communication from their institution regarding e-learning. As long as establishment of clear e-learning vision outweighs the competing distractions from this vision, deployment of e-learning should be the result. When distractions overcome e-learning vision, attrition would be the expected outcome. The participants generally showed a lack of strategies, models and institutional distractions; all of which were likely to influence their attitudes.

The measurement of these factors will create a clear image for e-learning vision. Also, in order to accelerate the acceptance of e-learning at Middle Eastern universities, it is important to measure consequences of e-learning and accordingly plan for managing the change process.

The next section, therefore, examines the theoretical framework in more detail.

6.4. ELMM Framework

The successful theories regarding adopting and executing e-learning, which also include many dimensions and angles of support and encouragement, could be clearly noticed through several studies (IHEP 2000; Khan 2001; Fresen 2005; Selim 2007; Boezerooij 2006). All of these studies highlight the importance of the university function in supporting e-learning in terms of student support, faculty support, course support, course management, resources and evaluation. Although, several studies have supported and investigated successful factors for e-learning, only a few have supported the multidimensionality construct for e-learning. Thus, the argument could be made for a two main factor structures, comprising only e-learning vision and consequences of e-learning vision.

The ELMM is presented in Table 6.1. The first phase consists of ten first-order factors (academic features, organizational features, behaviourism model, cognitivist model, constructivism model, organizing strategy, supporting strategy, learning strategy, developing strategy, evaluating strategy); three second-order factor (e-learning features, e-learning strategies and e-learning models); and one third-order factor (e-leaning vision). The second phase consists of nine first-order factors (students' behaviour, students' opinion , students' feeling, instructors'

behaviour, instructors' opinion, instructors feeling, communications effects, educational effects, organizational effects); three second-order factor (students' attitudes towards e-learning, instructors' attitudes towards e-learning, effects of e-learning) and one third-order factor (consequences of e-leaning vision).

In this study, these determinants had been examined in relation to the variable of perceived value. The Grounded Theory, EFA and SEM have supported the positive association between e-learning vision and each of the examined related factors; e-learning strategies, e-learning models and e-learning features. Moreover, the positive association between consequences of e-learning vision and each of the examined related factors (students' attitudes, instructors' attitudes and effects of e-learning) were supported.

The study was mainly mixed methods research. In the qualitative phase, the data for this study were collected by using in-depth interviews from the students and faculty members in public and private universities, which are October University and Ain Shames University in Egypt, Bahrain University and Delmon University in Bahrain, and Applied Science University and Sur University in Oman. In the quantitative phase, the data for this study were collected using an online survey instrument; quantitative data were collected from 600 students and faculty members. The online survey instrument was designed based on the theoretical framework which was created in the Grounded Theory. The online surveys instrument consisted of six scales.

As the data were collected, they were entered into SPSS20 statistical software, and cleaned in order to exclude any errors in the data. A couple of statistical analyses were carried out on the collected quantitative data in order to ensure the reliability and the validity of the survey instrument. First, Cronbach's alpha reliability coefficient was used to measure the internal consistency of the scores on various variables. Second, factor analysis was used to check the construct validity of the survey.

Also, descriptive statistics (for example: mean, median, mode, frequency, sum, standard deviation) were used to summarize and describe the data collected from the respondents concerning their demographic characteristics and to explore faculty members and students attitudes toward e-learning. Results from both quantitative and qualitative data indicated that faculty members and students tend to have negative attitudes toward e-learning in Middle Eastern universities. The respondents' mean score was approximately 2 on a 5-point scale.

In the same context, inferential statistics were used to answer Research Questions 1 and 2 by examining the relationships between the e-learning vision and its factors from one side, and consequences of e-learning vision and its variable from another side.

In the first phase, regression analysis showed, firstly, there are significant linear relationships between e-learning vision and each one of the following three factors: (a) e-learning strategies, (b) e-learning models, and (c) e-learning features. Secondly, there are significant linear relationships between e-learning strategies and each one of the following five factors:

- Evaluating,
- Developing,
- Learning,

- Supporting,
- Organizing.

Thirdly, there are important linear relationships between e-learning models and each one of the following three factors:

- Constructivism,
- Cognitivist,
- Behaviourism.

Finally, there are other linear relationships between e-learning features and each one of the following two factors:

- Academic features,
- Organizational features.

In the second phase, regression analysis showed, firstly, there are significant linear relationships between consequences of e-learning vision and each one of the following three factors: (a) students' attitudes towards e-learning, (b) lecturers' attitudes towards e-learning, and (c) effects of e-learning. Secondly, there are significant linear relationships between students' attitudes and each one of the following three factors:

- Students' behaviours,
- Students' feelings',
- Students' opinions.

Thirdly, there are important linear relationship between instructors' attitudes and each one of the following three factors:

- Instructors' behaviours,
- Instructors' feelings',
- Instructors' opinions.

Finally, there are other linear relationships between effects of e-learning and each one of the following three factors:

- Communications effects,
- Organizational effects,
- Educational effects.

To help identify the underlying factors of ELMM and to which of these factors are related, they are displayed in matrix form in Table 6.1.

E-learning Maturity Model (ELMM)		
Third-Order Factors	**Underlying Factors (Second-Order Factors)**	**Underlying Factors (First-Order Factors)**
The First Phase (E-learning Vision)	ELMM-Models	Behaviourism
		Cognativism
		Constructivism
	ELMM-Strategies	Learning
		Developing
		Supporting
		Evaluating
		Organizing
	ELMM-Features	Academic Features
		Organizational Features
The Second Phase Consequences of e-learning vision	ELMM-Students' Attitudes	Behaviour
		Opinion
		Feeling
	ELMM-Lectures' Attitudes	Behaviour
		Opinion
		Feeling
	ELMM-Effects	Communications
		Educational
		Organizational

Table 6.1 ELMM Factors

6.5. Discussion of Findings

Research Question 1: What are the criteria affecting the introduction of the maturity model in the deployment of e-learning in Middle Eastern countries?

Findings from the in-depth interviews were used to identify and define factors related to maturity model and to generate surveys items. The in-depth interviews were analyzed by utilizing the Grounded Theory procedures of open, axial and selective coding. The six axial categories are presented, as they represented the factors that affect the introduction of maturity model. During the selective coding process, all of the axial categories were reviewed to determine the connections between them, and to generate the Grounded Theory that emerged during this study. Two comprehensive selective categories emerged that connected sets of the axial categories: (1) e-learning vision and (2) consequences of e-learning vision. The selective categories helped explain the criteria affecting the introduction of the maturity model in the deployment of e-learning in Middle Eastern countries. In the same context, the first research question addressed issues which were not entirely satisfied using statistical methods and can broadly be grouped into the two main themes being addressed in this thesis:

1. E-learning Vision which includes the following factors:
   - E-learning strategies
   - E-learning models
   - E-learning features

2. Consequences of e-learning vision which includes the following factors:
   - Students' attitudes towards e-learning
   - Lecturer attitudes towards e-learning
   - Effects of e-learning

Research Question 2: To what extent could these criteria measure maturity level in e-learning?

Factor analysis was used to examine the construct validity of the instruments as the following:

First Scale (ELMM-Mo)

The factor analysis identified 12 items in three groups, Factor 1, Factor 2 and Factor 3, and the Cronbach reliability alpha coefficient for the 12-item scale was 0.887. The 12 items had a reliability coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure e-learning models.

Second Scale (ELMM-Str)

The factor analysis identified 21 items in five groups, Factor 1, Factor 2, Factor 3, Factor 4 and Factor 5, and the Cronbach reliability alpha coefficient for the 21 items scale was 0.934. The 21items had a reliability coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure e-learning strategies.

Third Scale (ELMM-Fea)

The factor analysis identified nine items in two groups, as Factor 1, Factor 2, and the Cronbach reliability alpha coefficient for the nine items scale was 0.877. The nine items had a reliability coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure e-learning features.

Fourth Scale (ELMM-StuAtt)

The factor analysis identified 15 items in two groups, as Factor 1, Factor 2 and the Cronbach reliability alpha coefficient for the 15-item scale was 0.885. The 15-item had a reliability coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure students' attitudes.

Fifth Scale (ELMM-LecAtt)

The factor analysis identified 11 items in two groups, Factor 1, Factor 2 and the Cronbach reliability alpha coefficient for the 11 items scale was 0.873. The 11 items had a reliability coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure instructors' attitudes.

Sixth Scale (ELMM-Eff)

The factor analysis identified 26 items in two groups, Factor 1, Factor 2 and the Cronbach reliability alpha coefficient for the 26 items scale was 0.946. The 26 items had a reliability coefficient indicating high inter-item correlation, and indicating that these factors could be used to comprise an instrument to measure effects of e-learning.

On the other hand, The CFA results confirmed the proposed six constructs and they can be used in testing and validating ELMM with high validity and acceptable fit measures.

6.6. Contribution of the Thesis

The contribution of this research study is divided into three parts – methodology, theory and practice – which are presented in the following paragraphs.

6.6.1. Contribution to Methodology

Exploratory sequential design method has been applied in e-learning field for first time and it achieved the following points: (a) erased separations between theory and research, (b) it introduced a model for integration between qualitative research and quantitative methods, (c) it erased the claims that the quest for rigour made qualitative research illegitimate, (d) it supported beliefs that qualitative methods are impressionistic and unsystematic is not right, (e) it enabled integration between data collection and analysis, and (f) it demonstrated that qualitative research could produce theory development.

6.6.2. Contribution to Theory

The in-depth interview categories that were generated from this thesis were congruent with, and extended, previous research and theory on e-learning. However, none of the individual research studies reviewed depicted precisely the same ELMM in a single study that developed from this Grounded Theory thesis. The selective categories concerning the e-learning vision, and the consequences of e-learning vision, which were supported by this thesis are not in line with research conducted by Boezerooij (2006), Selim (2007), Fresen (2005), Khan (2001), and Oliver (2001) who found a set of categories of factors deemed critical when adopting e-learning without determining the methodology for measuring these factors.

While the selective coding process, all of the axial categories were studied to define the relations between them, and to produce the Grounded Theory that emerged during this thesis. The conditions, action and interaction, and the results were studied during this selective coding method. Two comprehensive selective categories appeared that connected sets of the axial categories: (1) e-learning vision, and (2) consequences of the vision. The selective categories assisted clarify the criteria affecting the introduction of the maturity model in the deployment of e-learning in Middle Eastern countries. Thus, according to the participants, the dimensions for the e-learning vision essentially did not exist, which means an absence of the e-learning vision and therefore we should reap the fruits of consequences of the absence of a vision.

The lack of the e-learning vision was represented by the categories dealing mainly with institutional and pedagogical factors that impacted the introduction of the maturity model such as e-learning strategies, e-learning models, and e-learning features. Consequences of the absence

vision included both individual and educational factors that impeded the participants from using e-learning, such as students' attitudes, staff members' attitudes and the effects of e-learning (See Table 4.6).

6.6.3. Contribution to Practice

When conducting an assessment each dimension is rated, with reference to the exemplars, for performance from 'Strongly Disagree' to 'Strongly Agree'. The ratings at each dimension are done on the basis of the evidence collected from the staff and students. The ELMM model provides a useful set of guides but that its use needs to be considered in the context of each institution's environment and particular approach to e-learning. The framework presented here provides a list of the key processes necessary for improvements in e-learning and an indicative set of possible outcomes for defining each of the possible levels in a maturity model.

Most of the items used to operationalize ELMM's constructs were adopted from qualitative data analysis. The used items were validated and reworded to fit the ELMM context of this thesis. In terms of contribution to practice, this thesis provided a model for assessing the e-learning maturity level at Middle Eastern universities as follows:

Scale 1: Measuring Instrument for an Instructional Model for E-learning

The instrument for an instructional model construct was tested using 12 scale items which were adopted from in-depth interviews. The first five items assessed the combining constructivism with cognitivist. The second five items assessed the combining constructivism with behaviourism. The other two items assessed the respondents' sociocultural about e-learning.

Scale 2: Measuring Instrument for E-learning Strategies

The instrument for e-learning strategies construct was tested using 21 scale items which were adopted from in-depth interviews. The first seven items assessed the e-learning evaluating system. The second five items assessed the supporting methods. The third four items assessed the developing procedures. The fourth three items assessed the course contents. The other two items assessed the organizing procedures for e-learning.

Scale 3: Measuring Instrument for E-learning Features

The instrument for e-learning features construct was tested using nine scale items; the nine, which were adopted from in-depth interviews. The first five items assessed the academic features. The second four items assessed the organizing features.

Scale 4: Measuring Instrument for Students' Attitudes

The instrument for students' attitudes construct was tested using 15 scale items which adopted from in-depth interviews. The first thirteen items assessed the combining of feelings and opinions. The second four items assessed the behaviours.

Scale 5: Measuring Instrument for Lecturers' Attitudes

The lecturers' attitudes construct was tested using 11 scale items which were adopted from in-depth interviews. The first seven items assessed the opinions of the instructor about e-

learning. The other four items assessed the instructor's feelings in handling and explaining e-learning tools used in his/her hybrid class.

Scale 6: Measuring Instrument for E-learning Effects

The instrument for e-learning effects construct was tested using 26 scale items which were adopted from in-depth interviews. The first nineteen items assessed the collaborative learning. The second seven items assessed the organizational effects.

Table 6.2 sets out these scales (instruments) in relation to each factor.

Instrument Name	Factor Name	Items
Measuring Instrument for an Instructional Model	Mental Structures	MCog3- MCon9- MCon1- MCon5- MCon4
	Individual Actions and Decisions	MCon7- MCon2- MCon3- MBeh3- MBeh2
	Sociocultural	MCon6- MCon8
Measuring Instrument for E-learning Strategies	Evaluating	SE3- SO9- SS1 -SL1- SS4- SO4- SD6
	Supporting	SO7- SO6 -SL7 -SE1- SD4
	Developing	SL3- SS2 -SL6- SO2
	Learning	SD3 -SO1- SS6
	Organizing	SO3 -SL10
Measuring Instrument for E-learning Features	Academic Features	ELF\R -ELF\AC -ELF\OE- ELF\LS ELF\PE
	Organizing Features	ELF\OA- ELF\GC -ELF\CC - ELF\C-E
Measuring Instrument for Students' Attitudes	Feelings and Opinions	SFee2-SFee1-SOpi8-SFee4-SOpi7-SOpi4-SFee5-SOpi6-SOpi1SFee3-SOpi3-SOpi5-SOpi2
	Behaviours	SBeh4-SBeh1
Measuring Instrument for Lecturers' Attitudes	Opinions	UOpi2- UOpi5 -UBeh1- UOpi6- UOpi9- UOpi8 -UOpi3
	Feelings	UOpi7- UBeh2 -UFee2 -UFee3
Measuring Instrument for E-learning Effects	Educational and Communications Effects	ECom1- EEdu8- ECom4- EEdu5 - EEdu3 ECom3 -EEdu2- ECom6 - ECom10 -EEdu1 EEdu4- ECom9- EEdu9 -ECom2 -ECom8 ECom7- EEdu7- EEdu6- ECom5
	Organizing Effects	EOrg6- EOrg4 -EOrg2- EOrg3- EOrg5 EOrg1- EEdu10

Table 6.2 the relation between Instruments, factors and items

The aim of the Table 6.2 is to provide the reader with an overview of the instruments' design and facilitate an understanding of the findings discussed in this chapter.

The next section provides an overview of the strengths and limitations of the thesis.

6.7. Strengths and limitations of the Thesis

The investigation used a Grounded Theory strategy. In so doing, it has demonstrated the value of this approach for investigating studies of this nature, which seek to gain an understanding of staff and students' experiences of e-learning. The Grounded Theory strategy strengthened this study by enabling me to conduct an in-depth study of a complex social issue by focusing on a specific group, in a specific situation, yet in a variety of physical locations. The nature of the study, i.e. the investigation of real people in day-to-day situations, meant that there were few opportunities, as a researcher, to have control over events (Robson 1993). However, the Grounded Theory strategy facilitated research under these conditions.

Using mixed methods of data collection allowed for triangulation of data, which I believe strengthened the reliability and validity of the study. Furthermore, the Grounded Theory approach made it easier to gain a holistic view of the differing aspects of e-learning. Moreover, by utilizing this approach the thesis was able to fulfill the purpose of the study and facilitate an understanding of the staff and students' experience of e-learning; an outcome that would have proved more difficult to achieve with an alternative approach. Finally, and most importantly, the approach enabled the study to develop theoretical generalizations about e-learning so that people can learn from this theory and add to their existing knowledge of other cases (Stake 1995), thus increasing their overall understanding of e-learning.

Also, using exploratory factor analysis is a further strength of the research. The exploratory factor analysis made it easier to examine the structure or relationship between variables and detection the multidimensionality of a theoretical construct. Moreover, by utilizing the exploratory factor analysis the thesis was able to evaluate the construct validity and prove the proposed theory.

A further strength of the research was the use of confirmatory factor analysis. Because e-learning is still in its infancy, most researches to date have been carried out using quantitative or qualitative methods without any validity or reliability methods. Indeed, without such measurement tools the area of e-learning would not have progressed so rapidly. Furthermore, the confirmatory factor analysis made it easier to specify the exact factor model in advance as opposed to exploratory factor analysis which seeks an undetermined structure for a set of variables (Stevens 2002).

A limitation of the thesis was that during the collection of data, time constraints prevented me from collecting more data. This was due to the necessity to develop the theory, test hypotheses, and conduct analysis.

Moreover, data was mainly collected electronically by using online questionnaires; the limitations come from the deficiencies related with the use of questionnaire for data collection. For example, some participants may have misinterpreted some questions, some participants might have ignored certain questions, some participants might have dishonestly answered some questions, and some participants might have skewed the sample due to the suggestion that those who had an interest in the subject may be more likely to respond.

6.8. Directions for Future Research

This final section of the thesis makes suggestions for future research. The thesis has identified a wide range of issues, many of which are worthy of separate research. There is, therefore, a great deal that could be investigated further. However, there are offered here as allowing the most potential for further research.

An area considered worthy of further investigation is that of e-learning models. This study identified a lack of aims for e-learning in the Middle East and further highlighted the absence of clear vision. The research could conduct a broader investigation into combining between traditional learning theories and e-learning.

A further area identified as warranting further investigation is e-learning strategies. This thesis identified that e-learning strategies consist of learning, developing, supporting, evaluating and organizing. This finding has implications for the deployment of e-learning. It raises the issue of how to manage the e-learning process. Further research might investigate this topic in greater detail across a range of procedures.

Therefore, the following recommendations were made, based on the findings of this study:

1. Due to the limited number of research studies in the Middle East concerning the e-learning maturity model, as well as the increased interest of e-learning in the Middle East, similar studies (with variations in setting, population, data collection method, etc) are needed in this area in order to provide a comprehensive body of research that would be used as a reference in the planning and implementation of e-learning.
2. Besides studies that investigate the e-learning maturity model, there is a need to conduct studies that investigate information system researchers' opinions towards e-learning to convert the maturity model to model for successful deployment for e-learning.
3. There is a need to investigate e-learning strategies in the Middle East, and the reasons that underline the low level of institutional support to faculty members and students in terms of the provided training, technical support, instructional design support, and incentives.
4. Research studies with better sample representativeness, in terms of faculty and student rank, might enable better generalization.
5. A multi-institutional exploratory sequential study should be conducted to identify specific items that formulate e-learning maturity model in order to have comprehensive set of potential predictors of the e-learning maturity level.
6. Future studies can carry out in depth investigation into the e-learning models related to behaviourism, cognitivist and constructivism, in order to create plans to implement e-learning in the institutions of higher education.

Finally, more extensive researches have to evaluate the extent to which e-learning models impact students' feelings, behaviours and opinions. This thesis identified dominant e-learning results amongst the organizational, communications and educational effects. It is possible that people in other professions might show other effects for e-learning models which course designers and tutors may wish to take into account in designing e-learning courses.

6.9. Conclusion

One of the research findings is the development of a model of factors that affect the deployment of e-learning in Middle Eastern universities. This model provides for the first time a comprehensive understanding of what factors affect the uptake of e-learning at Middle Eastern universities. This model could be considered an adaptive model as it reflects Middle Eastern status in terms of readiness to deploy e-learning.

The model was developed based on the findings of the field survey conducted through the research. It provided for the first time, as the research did not succeed in finding similar data, a detailed current image of the state of e-learning readiness in the Middle East. It explored Middle Eastern e-readiness from six different angles: e-learning strategies; models; features; students and instructors attitudes toward e-learning, and effects of e-learning. These detailed data provide a source of information which was not available before, as throughout the literature reviews conducted it was difficult to find recent data relating to the Middle Eastern state of e-learning readiness.

Another finding of the research was the first time introduction of a model to measure maturity level in e-learning in higher education in the Middle East. The model provides a set of procedures deemed helpful for the deployment of e-learning in Middle Eastern universities. The model was developed based on three main pillars:

- Grounded Theory concerned with ELMM dimensions
- Middle Eastern current state of e-readiness
- Analysis of the results of the field survey conducted to investigate to what extent these criteria could measure maturity level in e-learning.

A third contribution of the research is the development of the method itself, including the procedures used to answer the research questions and achieve its goals and objectives. The methodology used could be described as the Exploratory Sequential Design which could be applied to develop a model for e-learning deployment for any country. The method, starting with the literature review, followed by an application of the research procedures until enough data has been collected, would allow the development of a model appropriate for the Middle East region.

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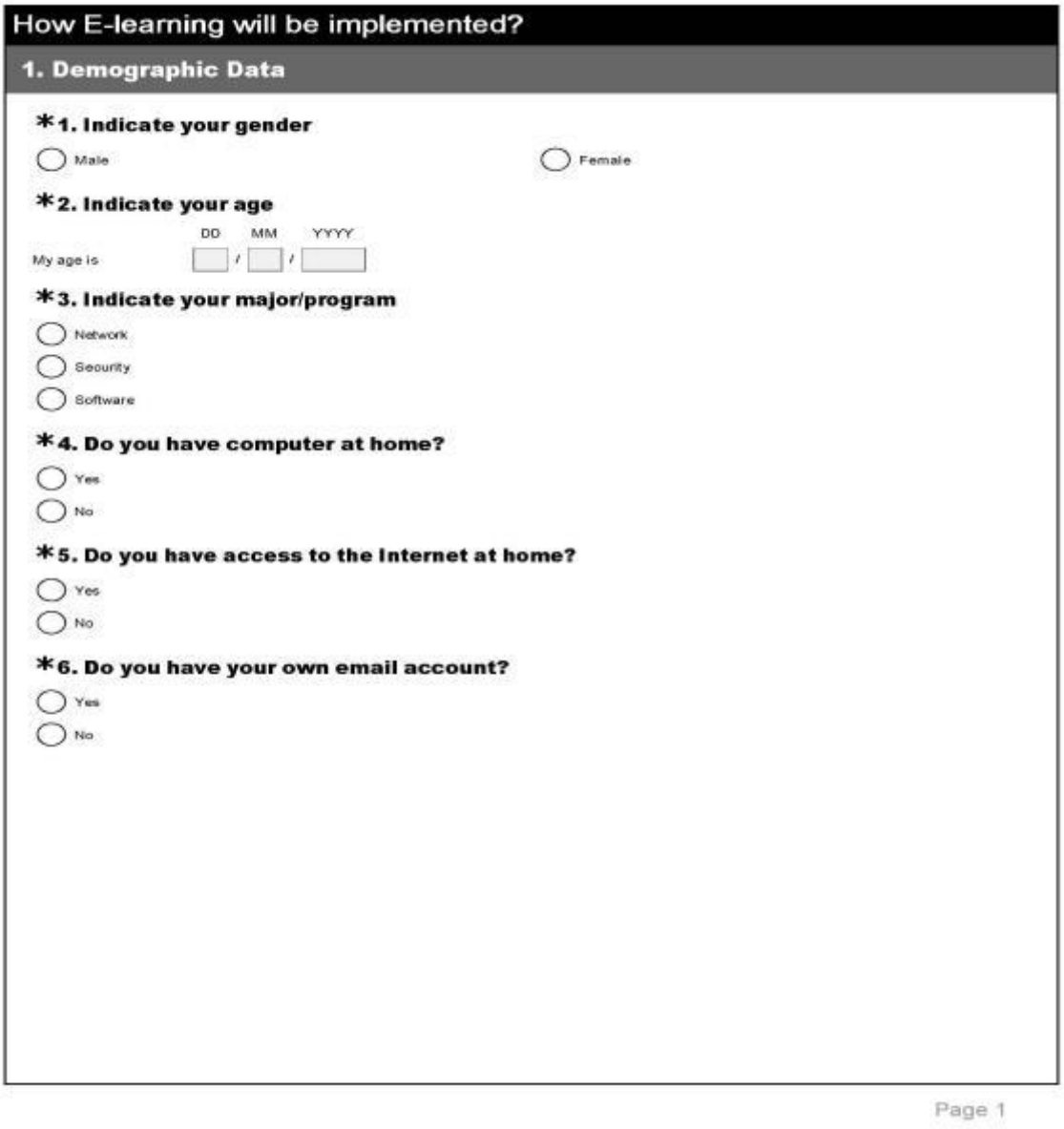
Appendix A: Consent to Participate In Research

Department of Information Technology
College of Applied Science
Dear participants,
I am currently preparing a research study that aim to explore the lecturers and students attitudes towards e-learning as well as the factors that might formulate e-learning maturity model. This study is a requirement for obtaining a doctorate degree from Middlesex University/ United Kingdom.
Please, answer all the questions where that might take from you up to ten minutes. Answering the survey is voluntary and your answer will not affect you in any way. All the answers will be treated confidentially and they will be treated as set of data at the time of writing research.
Please accept my deepest gratitude for providing such information.

Dean of College

Appendix B: How E-learning will be Implemented?


How E-learning will be implemented?

1. Demographic Data

*1. Indicate your gender

Male Female

*2. Indicate your age

DD MM YYYY

My age is / /

*3. Indicate your major/program

Network

Security

Software

*4. Do you have computer at home?

Yes

No

*5. Do you have access to the Internet at home?

Yes

No

*6. Do you have your own email account?

Yes

No

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How E-learning will be implemented?

2. Behaviorism

***1. Behaviorism**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
MBeh1- All materials have explicit objectives with respect to the student behaviour when accessing web pages.	◯	◯	◯	◯	◯
MBeh2- I can Use self-assessment questions as interactive activities in the learning materials.	◯	◯	◯	◯	◯
MBeh3- I found the step-by-step description of learning materials in small chunks useful.	◯	◯	◯	◯	◯

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How E-learning will be implemented?

3. Cognitivism

***1. Cognitivism**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
MCog1- It is straight forward for me to find the annotation and notes in the course web site.	◯	◯	◯	◯	◯
MCog2- It is straight forward for me to find instructions for how to learn.	◯	◯	◯	◯	◯
MCog3- It is straight forward for me to find information by using a search engine.	◯	◯	◯	◯	◯

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How E-learning will be implemented?

4. Constructivism

***1. Constructivism**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
MCon1- I usually Use the discussion forums and chat (both synchronous and asynchronous techniques) with my instructors and colleagues.	◯	◯	◯	◯	◯
MCon2- Usually the instructor responses quickly to students' e-mails.	◯	◯	◯	◯	◯
MCon3- I usually connect with my colleagues through email.	◯	◯	◯	◯	◯
MCon4- The web site helps me to accomplish the Group projects.	◯	◯	◯	◯	◯
MCon5- The web site supports me by Streaming media.	◯	◯	◯	◯	◯
MCon6- The social activities on the net increase my course interaction.	◯	◯	◯	◯	◯
MCon7- I found different learning views provided via website.	◯	◯	◯	◯	◯
MCon8- The website support Self-learning concept.	◯	◯	◯	◯	◯
MCon9- Most of electronic materials depend on critical and creative thinking.	◯	◯	◯	◯	◯

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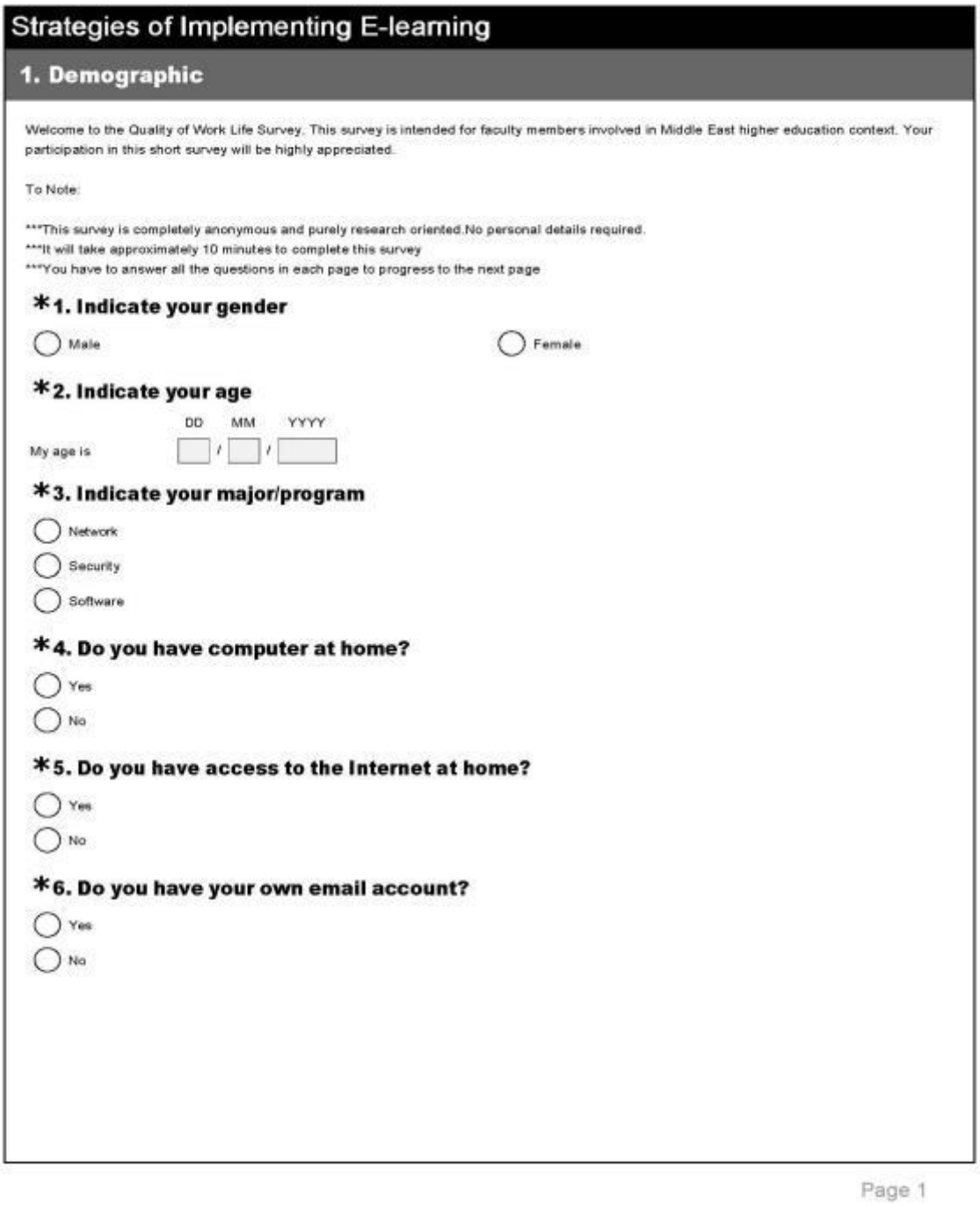
Appendix C: E-learning Strategies



Strategies of Implementing E-learning

1. Demographic

Welcome to the Quality of Work Life Survey. This survey is intended for faculty members involved in Middle East higher education context. Your participation in this short survey will be highly appreciated.

To Note:

***This survey is completely anonymous and purely research oriented.No personal details required.
***It will take approximately 10 minutes to complete this survey
***You have to answer all the questions in each page to progress to the next page

*1. Indicate your gender

Male Female

*2. Indicate your age

DD MM YYYY

My age is / /

*3. Indicate your major/program

Network
Security
Software

*4. Do you have computer at home?

Yes
No

*5. Do you have access to the Internet at home?

Yes
No

*6. Do you have your own email account?

Yes
No

Page 1

Strategies of Implementing E-learning

2. Learning

***1. Learning**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
SL1- Learning objectives guide the design and implementation of courses website.	◯	◯	◯	◯	◯
SL2- Students are provided with e-learning mechanisms for interaction with teaching staff and other students.	◯	◯	◯	◯	◯
SL3- Students are provided with e-learning skill development.	◯	◯	◯	◯	◯
SL4- Students are provided with expected staff response times to student communications.	◯	◯	◯	◯	◯
SL5- Students receive feedback on their performance within courses website.	◯	◯	◯	◯	◯
SL6- Students are provided with support in developing research and information literacy skills through the website.	◯	◯	◯	◯	◯
SL7- E-Learning designs and activities actively engage students.	◯	◯	◯	◯	◯
SL8- E-Assessment is designed to progressively build student competence.	◯	◯	◯	◯	◯
SL9- Student work is subject to specified e-calendars.	◯	◯	◯	◯	◯
SL10- E-Courses are designed to support diverse learning styles and learner capabilities.	◯	◯	◯	◯	◯

Strategies of Implementing E-learning

3. Development

***1. Development**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
SD1- Teaching staff are provided with design and development support when engaging in e-learning.	◯	◯	◯	◯	◯
SD2- Course development, design and delivery are guided by e-learning procedures and standards.	◯	◯	◯	◯	◯
SD3- An explicit plan links e-learning technology, pedagogy and content used in courses.	◯	◯	◯	◯	◯
SD4- Courses are designed to support disabled students.	◯	◯	◯	◯	◯
SD5- All elements of the physical e-learning infrastructure are reliable, robust and sufficient.	◯	◯	◯	◯	◯
SD6- All elements of the physical e-learning infrastructure are integrated using defined standards.	◯	◯	◯	◯	◯

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Strategies of Implementing E-learning

4. Support

***1. Support**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
SS1- Students are provided with technical assistance when engaging in e-learning.	◯	◯	◯	◯	◯
SS2- Students are provided with library facilities when engaging in e-learning.	◯	◯	◯	◯	◯
SS3- Student enquiries, questions and complaints are collected and managed formally through web help-desk.	◯	◯	◯	◯	◯
SS4- Students are provided with personal and learning support services when engaging in e-learning.	◯	◯	◯	◯	◯
SS5- Teaching staff are provided with e-learning pedagogical support and professional development.	◯	◯	◯	◯	◯
SS6- Teaching staff are provided with technical support in using digital information created by students.	◯	◯	◯	◯	◯

Strategies of Implementing E-learning

5. Evaluation

***1. Evaluation**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
SE1- Students are able to provide regular feedback on the quality and effectiveness of their e-learning experience.	◯	◯	◯	◯	◯
SE2- Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience.	◯	◯	◯	◯	◯
SE3- Regular reviews of the e-learning aspects of courses are conducted.	◯	◯	◯	◯	◯

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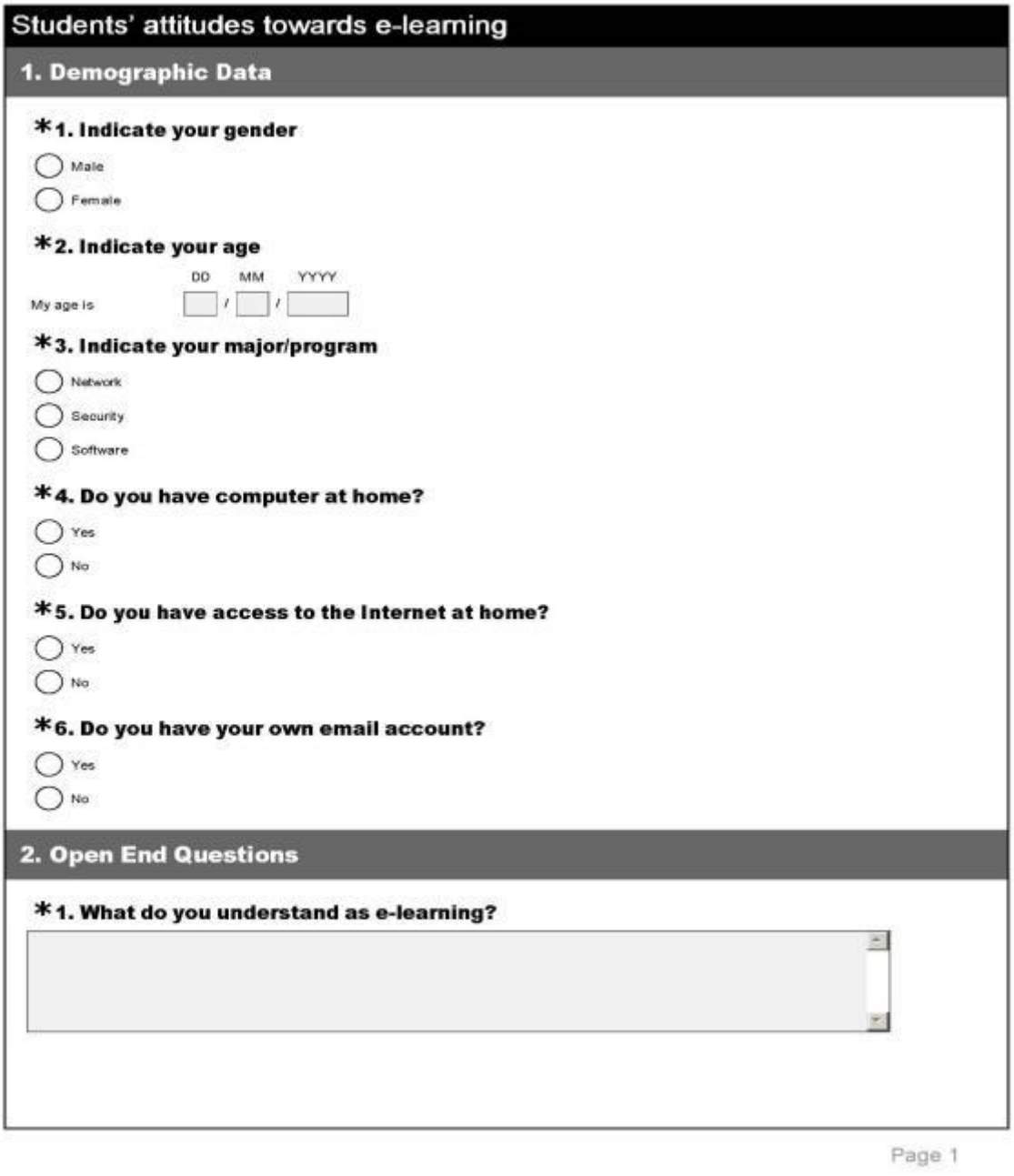
Strategies of Implementing E-learning

6. Organization

***1. Organization**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
SO1- Formal criteria guide the allocation of resources for e-learning design, development and delivery.	◯	◯	◯	◯	◯
SO2- Institutional learning and teaching policy and strategy explicitly address e-learning.	◯	◯	◯	◯	◯
SO3- E-learning technology decisions are guided by an explicit plan.	◯	◯	◯	◯	◯
SO4- Digital information use is guided by an institutional information integrity plan.	◯	◯	◯	◯	◯
SO5- E-learning initiatives are guided by explicit development plans.	◯	◯	◯	◯	◯
SO6- Students are provided with information on e-learning technologies prior to starting courses.	◯	◯	◯	◯	◯
SO7- Students are provided with information on e-learning pedagogies prior to starting courses.	◯	◯	◯	◯	◯
SO8- Students are provided with administration information prior to starting courses.	◯	◯	◯	◯	◯
SO9- E-learning initiatives are guided by institutional strategies and operational plans.	◯	◯	◯	◯	◯

Appendix D: Students' Attitudes Towards E-learning



Students' attitudes towards e-learning

1. Demographic Data

*1. Indicate your gender

- Male
- Female

*2. Indicate your age

My age is DD / MM / YYYY

*3. Indicate your major/program

- Network
- Security
- Software

*4. Do you have computer at home?

- Yes
- No

*5. Do you have access to the Internet at home?

- Yes
- No

*6. Do you have your own email account?

- Yes
- No

2. Open End Questions

*1. What do you understand as e-learning?

Page 1

Students' attitudes towards e-learning

***2. How was your interaction with your classmates enhanced by e-learning?**

***3. Would you prefer to attend courses with e-learning support in the future?**

***4. Which e-learning features did you use?**

***5. What were the implications from e-learning in your performance?**

***6. What were the implications from e-learning to your major/program?**

3. Behavior

***1. Behavior**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
SBeh1- If given a choice I would first search for a website to find information for an assignment before I search for a book.	◯	◯	◯	◯	◯
SBeh2- I am using Web Sites whenever I can.	◯	◯	◯	◯	◯
SBeh3- I have no problems to find my way around a Web Site.	◯	◯	◯	◯	◯
SBeh5- Using Web Sites has increased my interaction with other students	◯	◯	◯	◯	◯
SBeh6- I am using all features in E-learning.	◯	◯	◯	◯	◯

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Students' attitudes towards e-learning

4. feeling

*1. Feeling

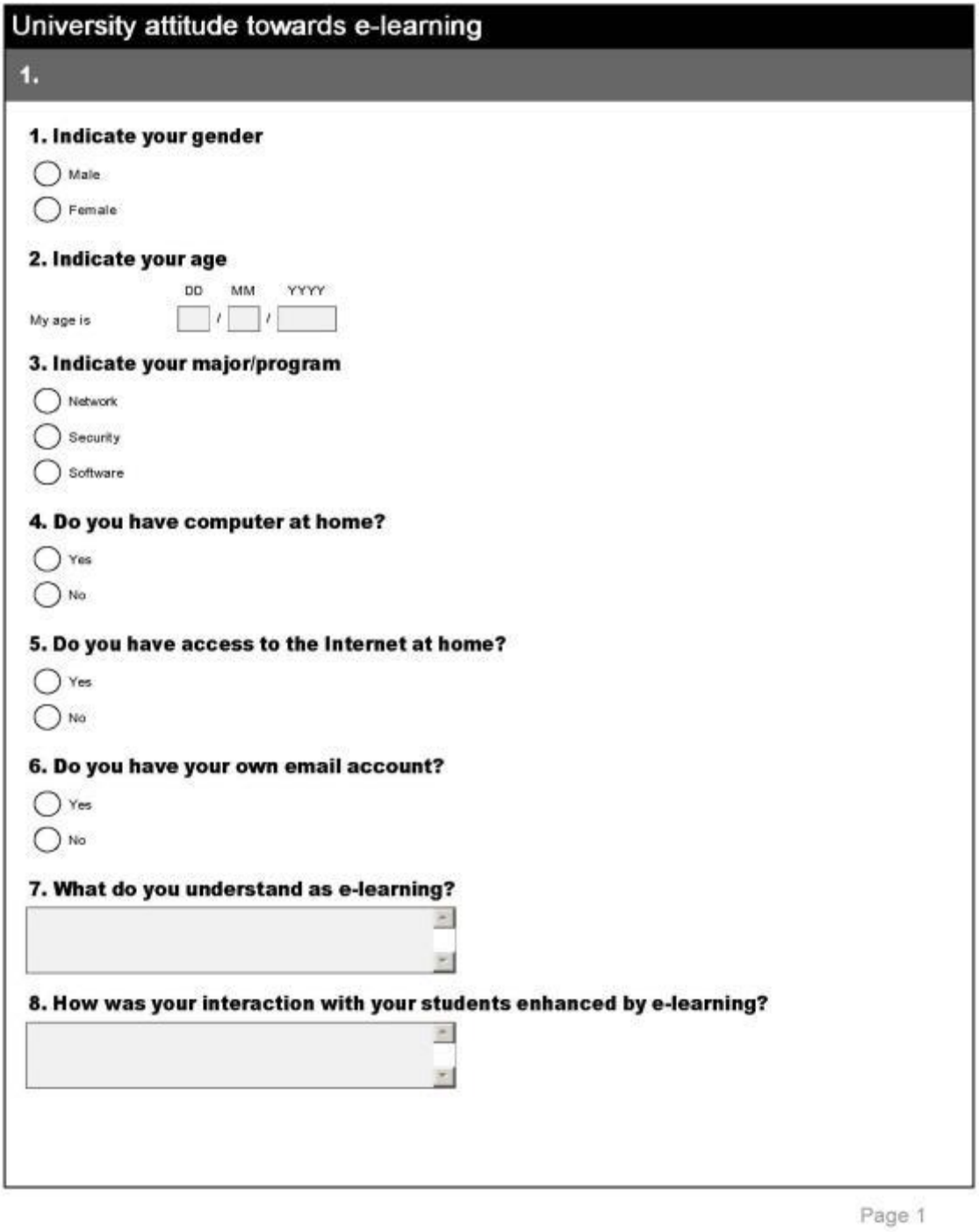
	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
SFee1- If I had a choice I would prefer to learn from a website than from a book.	◯	◯	◯	◯	◯
SFee2- SFee2- I feel with power when asked to use Web Sites for assignment.	◯	◯	◯	◯	◯
SFee4- I feel online exam is a good tool.	◯	◯	◯	◯	◯
SFee5-Learning through Web Sites encourages me.	◯	◯	◯	◯	◯
SFee6- My university has got the technology needed for the delivery of e-learning	◯	◯	◯	◯	◯

5. Opinion

*1. Opinion

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
SOpi1- The Web based assignment was easier to read than the paper based assignment	◯	◯	◯	◯	◯
SOpi3-The Web quiz was easier to understand than the Paper quiz activity.	◯	◯	◯	◯	◯
SOpi4- Students learn more using Web Assisted activities than Paper Assisted activities	◯	◯	◯	◯	◯
SOpi5-Finding your way around a Web Site is easier than finding your way around a Book.	◯	◯	◯	◯	◯
SOpi6-I find it easy to learn online.	◯	◯	◯	◯	◯
SOpi8- Many of instructors encourage me to use e-learning methods.	◯	◯	◯	◯	◯
SOpi9-E-learning is efficient as teaching method.	◯	◯	◯	◯	◯
SOpi11- I got support and technical information about how to use communication and discussion board tools	◯	◯	◯	◯	◯

Appendix E: University Attitudes Towards E-learning



University attitude towards e-learning

1.

1. Indicate your gender

- Male
- Female

2. Indicate your age

My age is DD / MM / YYYY

3. Indicate your major/program

- Network
- Security
- Software

4. Do you have computer at home?

- Yes
- No

5. Do you have access to the Internet at home?

- Yes
- No

6. Do you have your own email account?

- Yes
- No

7. What do you understand as e-learning?

8. How was your interaction with your students enhanced by e-learning?

Page 1

University attitude towards e-learning

9. Would you prefer to deliver/teach courses with e-learning support in the future?

***10. Which e-learning features did you use?**

***11. What were the implications from e-learning in the performance of your students?**

***12. What were the implications from e-learning to the student experience of their major/programme?**

Page 2

University attitude towards e-learning

2. Behavior

***1. Behavior**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
UBeh1- I am Using E-learning in collaborative learning.	◯	◯	◯	◯	◯
UBeh2- I am using e-exams whenever I can.	◯	◯	◯	◯	◯
UBeh3- I use all features in Blackboard	◯	◯	◯	◯	◯

Page 3

University attitude towards e-learning

3. Feeling

***1. Feeling**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
UFee1- E-Learning help students to communicate with instructors.	◯	◯	◯	◯	◯
UFee2- Blackboard is easy to handle.	◯	◯	◯	◯	◯
UFee3- E-calendar helps me to coordinate with my students.	◯	◯	◯	◯	◯

Page 4

University attitude towards e-learning

4. Opinion

***1. Opinion**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
UOpi1-E-Learning saves time and effort for both teachers and students.	◯	◯	◯	◯	◯
UOpi2-E-Learning increases access to education and training.	◯	◯	◯	◯	◯
UOpi3-E-Learning will increase my efficiency in teaching.	◯	◯	◯	◯	◯
UOpi4-E-Learning enables collaborative learning.	◯	◯	◯	◯	◯
UOpi5-E-Learning can engage learners more than other forms of learning.	◯	◯	◯	◯	◯
UOpi6-E-Learning increases the quality of teaching and learning because it integrates all forms of media; print, audio, video, and animation.	◯	◯	◯	◯	◯
UOpi7-E-Learning increases the flexibility of teaching and learning.	◯	◯	◯	◯	◯
UOpi8-E-Learning improves communication between students and teachers.	◯	◯	◯	◯	◯
UOpi9-E-Learning enhances the pedagogic value of a course.	◯	◯	◯	◯	◯

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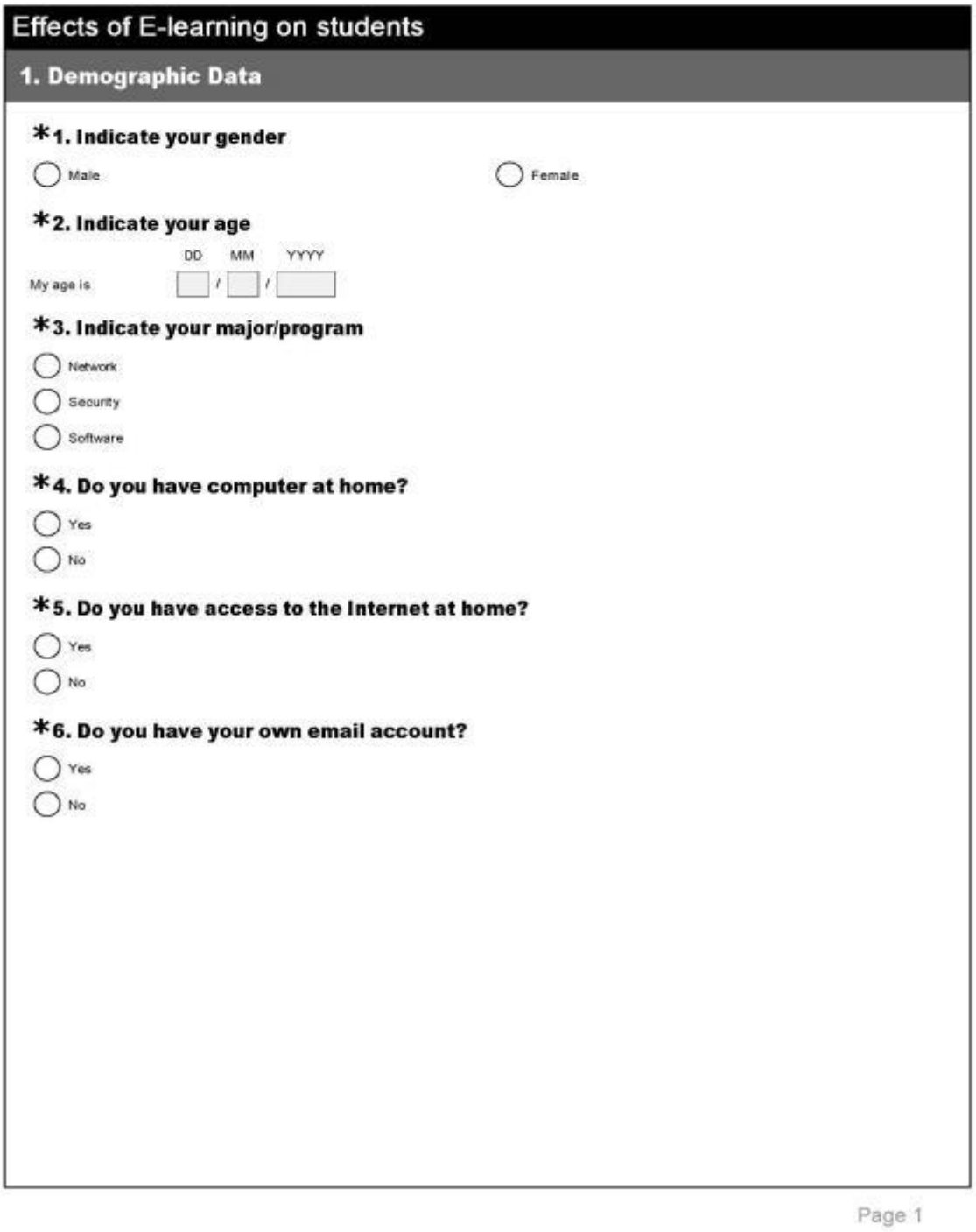
Appendix F: Effects of E-learning on Students



Effects of E-learning on students

1. Demographic Data

*1. Indicate your gender

Male

Female

*2. Indicate your age

My age is DD / MM / YYYY

*3. Indicate your major/program

Network

Security

Software

*4. Do you have computer at home?

Yes

No

*5. Do you have access to the Internet at home?

Yes

No

*6. Do you have your own email account?

Yes

No

Page 1

Effects of E-learning on students

2. Open End Questions

*1. In your opinion what are the Implications of e-Learning for Students?

*2. what are the most significant implications?

Page 2

Effects of E-learning on students

3. Communications

***1. Communications**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
ECom1-E-learning provided a reliable means of communication.	◯	◯	◯	◯	◯
ECom2-E-learning portion allowed for social interaction.	◯	◯	◯	◯	◯
ECom3-The discussion section is a great way to interact with my fellow classmates.	◯	◯	◯	◯	◯
ECom4-The discussion section is a great way to interact with the instructor.	◯	◯	◯	◯	◯
ECom5-The discussion section helped me to ask and answer questions.	◯	◯	◯	◯	◯
ECom6-I emailed the instructor through the course Website.	◯	◯	◯	◯	◯
ECom7-I regularly used the discussion section.	◯	◯	◯	◯	◯
ECom8-The course Website helped to create a sense of community.	◯	◯	◯	◯	◯
ECom9-The course Website increased my interactions with the instructor.	◯	◯	◯	◯	◯
ECom10-Course Websites extend personal interactions.	◯	◯	◯	◯	◯

Page 3

Effects of E-learning on students

4. Educational

***1. Educational**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
EEdu1- I found the links contained on the course Website valuable.	◯	◯	◯	◯	◯
EEdu2- I used the course Website to help me understand course information.	◯	◯	◯	◯	◯
EEdu3- I found the course Website to be a helpful resource.	◯	◯	◯	◯	◯
EEdu4- I regularly used the course Website to answer my questions.	◯	◯	◯	◯	◯
EEdu5- I believe that course Websites enhance learning.	◯	◯	◯	◯	◯
EEdu6- I believe that course Websites will play an important role in college education in the future.	◯	◯	◯	◯	◯
EEdu7- The online lecture notes were a valuable resource.	◯	◯	◯	◯	◯
EEdu8- I read the instructor comments on my assignments.	◯	◯	◯	◯	◯
EEdu9- I found taking exams online convenient.	◯	◯	◯	◯	◯
EEdu10- The course Website is a great place for the instructor to place handouts.	◯	◯	◯	◯	◯

Effects of E-learning on students

5. Organizational

***1. Organizational**

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
EOrg1- I enjoyed submitting my assignments online.	◯	◯	◯	◯	◯
EOrg2- I found the calendar section to be a valuable resource.	◯	◯	◯	◯	◯
EOrg3- I keep track of my grades on assignments and tests online.	◯	◯	◯	◯	◯
EOrg4- I found the online submission of assignments convenient.	◯	◯	◯	◯	◯
EOrg5- I checked the assignment section for my grades.	◯	◯	◯	◯	◯
EOrg6- I liked that I had the ability to check my assignment grades online.	◯	◯	◯	◯	◯

Page 5

Appendix G: E-learning Features

*** 1. E-learning Features**

Please tick the relevant boxes to indicate how you would rate the following Blackboard components

Explain the importance of each item from your personal view

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1-ELF\LS-I found the Lecture Slides in the course Website valuable	○	○	○	○	○
2-ELF\AC-Assignment Components are very important	○	○	○	○	○
3-ELF\PE-Previous Exams are useful	○	○	○	○	○
4-ELF\OE-Online Exams are good tool	○	○	○	○	○
5-ELF\C-E-Calendar is important tool	○	○	○	○	○
6-ELF\CC-Communication Components help me to communicate with others	○	○	○	○	○
7-ELF\GC-Grade Center is very useful	○	○	○	○	○
8-ELF\OA-Online Attendance is useful tool	○	○	○	○	○
9-ELF\R-Other Resources are very helpful	○	○	○	○	○

Appendix H: Sample of Student Interview Transcript

1	**Interview Questions**
2	**Describe what sort of features do you use in e-learning? And why?**
3	Course Information
4	Announcements
5	Communications
6	External Resources
7	BB Save time and effort
8	**Describe your opinion about e-learning? Is it easy to access Black Board? Have you had problems getting to the site? What type of problems?**
9	It is comprehensive and flexible e-learning SW.
10	It delivers a course management system also provides online
11	Communication tool with students and teachers.
12	Technical problems appear through online exams that make me under pressure.
13	**Does site usage require any special technical skills?**
14	No the web site or BB does not require ant technical skills
15	**What do you like and dislike? Why?**
16	I like submitting assignment, it saves time and effort.
17	I dislike online exam because the system is slow and the time is very limited.
18	**Do you have a preference for information delivery, one over the other? Is one better than the other?**
19	I prefer to deliver information by email
20	I want all teachers use chat
21	**Does using the course website make you more motivated regarding class?**
23	I feel motivated when I get my grade and useful information.
24	**What type of content is provided by the site? Instructor info? Course info? Course documents? Schedules? Assignments? Resources? (Discuss each item)**
25	Instructor Information: view information about instructor like email and schedule.
26	Course Documents: to let me download course material.
27	Assignments: let me submit my assignments.
28	Calendar: but it is rarely used.
29	**What is the most important content provided? (Can't live without.) Why?**
30	Course document it lets me download course material
31	**What is the least important content provided? (Never used…doesn't matter if it's there.) And why?**
32	Discussion because it is not used from teacher and student
33	Also students and instructors are not online
34	I advise if BB connects with Face book and twitter
35	**Does the site utilize any audio or video technology? Do you watch the videos or listen to the recordings?**
37	Yes the site utilizes audio and video but not all teachers use it.
38	**What content is missing? What should be there that currently is not?**
39	Registration link from web site to registration department
40	**Does the provided content contribute to your learning? Why? Why not?**
41	Yes it helps me to follow my course
42	**Would you say that your learning experience is enhanced by the course website? If**

	so, why? If not, why?
43	yes for example submit assigment
44	**Would you say that you feel more connected to the class by having access to the course website?**
45	yes, all materials available 24/7 through website
46	**Would you say that the online submission of assignments was simple? If so, why? If not, why?**
47	yes it is excellent it saves time and effoert
48	**Would you say that the calendar section be a valuable resource. ? If so, why? If not, why?**
49	yes it is very important to let me arrange my time for quizes and exames
50	But not all teachers use it
51	**Did you attend other courses where instructors had course websites?**
52	**What was experience with these sites?**
53	not all instructors use websites
54	**Does your instructor use a course management system? If so, what information is provided via this focus?**
55	yes, course materials, labs and exames
56	**How does this differ from the information that is provided in the faculty website?**
57	this information are more related to our cources
58	**Do you ever learn from different resources through the web site?**
59	yes some instructors use different resources
60	**Does the website ever guide learners and instructors in conducting, managing and encouraging personalized learning activities through collaborative learning?**
61	Sometime it is way to connect between students and teachers. but some instructors
62	use BB just to put lecture slides, they do not see emails
63	**Do you ever give feedback on site design, information provided, organization, navigation, etc? What do the instructors say?**
64	no I do not give my feedback nobody ask me
65	**Does the usage of this technology enable interactions that were not possible without course websites?**
66	of course there is communication through website
67	**Do you have self-assessment questions as interactive activities in the learning materials?**
68	depending on instructors
69	**Do you have Step-by-step description of learning materials in small chunks?**
70	Also depends on instructors
71	**Does the educator set the objectives of the learning process?**
72	not all instructors
73	**Do you found Instructions for learning to learn?**
74	instructions to use BB but not for subjects
75	**Do you found the annotation and notes in course website?**
76	depending on instructors

Appendix I: Sample of Lecturer Interview Transcript

1	**Interview Questions**
2	**Describe what type of content do you provide on your site? Instructor info? Course info? Course documents? Schedules? Assignments? Resources? (Discuss each item)Why are these items supplied and not others?**
3	Depending on my time
4	**Do you provide resource links or supplemental information to support classroom lectures?**
5	I don't provide extra links or resources
6	**Do you provide any interactive content on your site? What form does the interaction take?**
7	All data are static data no interactive content
8	**How did you develop this content? What kind of feedback do you receive from the students regarding this type of content?**
9	The development of course content isn't my responsibility
10	**Do you ever ask the student for feedback/input on site specifics?**
11	collecting students' feedback is not my responsibility
12	**Do the students ever give feedback on site design, information provided, organization, navigation, etc? What do they say?**
13	Maybe in the next year we will start in evaluating students' responses
14	**Does your site utilize any audio or video technology? Do the students watch the videos or listen to the recordings?**
16	Internet infrastructure does not support these media
17	**What kind of feedback do you receive from the students regarding this type of content?**
18	No Audio or video added to the course
19	**What is the most important content provided? (Student can't live without.) Why?**
20	Lecture slides
22	**What is the least important content provided? (Likely never used…doesn't matter if it's there.) Why?**
23	Electronic calendar
24	**Do you think the provided content contribute to your students learning? Why? Why not?**
25	Really no, because the all contents can send by email
26	**Do the students use this information? How can you tell? What content is missing? What should be there that currently is not?**
27	From the beginning students don't use university website
28	**Would you say that your site enhances your students learning experience? If so, why? If not, why?**
29	the site does not enhance the students learning, there is no plan for this method
30	**Would you say that your site helps your students feel more connected to the class?**
31	I don't have special website
32	**Do you ever talk to the students about the course website? Why?**
33	I don't talk with my students about website because I haven't methods to enhance these contents

34	**How does this differ from the information that is provided on your faculty website?**
35	I do not know
36	**How is this similar to what is being provided on your faculty website? Overlap?**
37	nothings overlap
38	**Do you have a preference for information delivery, one over the other? Is one better than the other? Why?**
39	Mobile messages is perfect in urgent cases
40	**What approaches did you adopt to allow student to focus on online learning and to maximize e-learning resources reuse?**
41	Really I haven't any approaches to allow students to focus on online learning
42	**Does any of the provided content serve e-learning theories? Which ones? How do they help the learner construct knowledge?**
43	I don't know anything about e-learning theories
44	**Do you think using the course website make your students more motivated regarding class?**
45	If we have website
46	**What are the most important effects from e-learning on the learning process?**
47	In my opinion we don't implement e-learning with full word
48	**Are teaching staff provided with design and development support when engaging in e-learning?**
49	Teaching staff aren't provided with development support
50	**Which other departments in the college did you work with when developing course website(s)?**
51	We haven't department for developing course website
52	In your opinion, is there any difference in technical assistance and library facilities between e-learning and traditional learning? If yes, what are the differences?
53	Sure there are many differences in technical assistance and library facilities between e-learning and traditional learning for example:
54	electronic graduation projects examples
55	e-library
56	WiFi
57	**Are teaching staff provided with e-learning pedagogical support, professional development and technical support when engaging in e-learning? If so, how?**
58	teaching staff aren't provided with e-learning pedagogical support, professional development and technical support when engaging in e-learning
59	**What approaches did university adopt to allow regular reviews of the e-learning aspects of courses are conducted?**
60	Unfortunately we haven't clear vision for e-learning
61	**Are teaching staff and students able to provide regular feedback on quality and effectiveness of their e-learning experience?**
62	Unfortunately we haven't clear evaluation strategy for e-learning
63	**What strategies did university use to monitor, manage or regulate online learning?**
64	we haven't strategy to monitor online learning

65	**For example, did university make plans for online learning?**
66	We haven't plan for e-learning
67	**Are Students provided with information on e-learning pedagogies, information on e-learning technologies and administration information prior to starting courses?**
68	Unfortunately Students aren't provided with information on e-learning pedagogies, information on e-learning technologies and administration information prior to starting courses
69	**What are standard criteria which guide the allocation process of resources for e-learning design, development and delivery?**
70	We haven't standard criteria which guide the allocation process of resources for e-learning design, development and delivery
71	**Are there reviews of the e-learning aspects of courses are conducted?**
72	there aren't reviews of the e-learning aspects of courses
73	**Are teaching staff able to provide regular feedback on quality and effectiveness of their e-learning experience? If so, how? If not, why?**
74	Teaching staff aren't able to provide regular feedback on quality and effectiveness of their e-learning experience. We haven't evaluating system for e-learning.
75	**In your opinion, is there an explicit plan links e-learning technology, pedagogy and content used in courses? If yes, what is the plan? Moreover, what roles do students play in it?**
76	We haven't clear strategy for e-learning
77	**Did you experience any problems that interfered with or slowed down course website development?**
78	Infrastructure technology is very weak
79	Do you have any recommendations for how the course website development process can be improved in the future?
80	First we should have clear vision for e-learning
81	**Are Students provided with e-mechanisms and e-learning skill development for interaction with teaching staff and other students? If so, how?**
82	Students aren't provided with e-mechanisms and e-learning skill development for interaction with teaching staff and other students for that reason students don't use communications tools in e-learning
83	**Do you think students receive feedback on their performance within courses website? If so, how?**
84	students don't receive feedback on their performance within courses website for that reason they are disappointed
85	**Are students provided with support in developing research and information literacy skills through the website? If so, how?**
86	Students are provided with e-database for researches but nothing in their courses asking them to use it
87	**Do you know how E-Courses and E-Assessments are designed to support diverse learning styles and learner capabilities?**
88	No