FACTORS AFFECTING THE SUCCESS OF E-LEARNING PROCESSES IN SAUDI ARABIA

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FACTORS AFFECTING THE SUCCESS OF E-LEARNING PROCESSES IN SAUDI ARABIA

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Declaration and Statement

I declare that I have not, whilst being registered for the PhD program in Manchester Metropolitan University, been a registered candidate for another award of a university.

The material in the thesis has not been used in any other submissions for an academic award.

To my parents and family

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ABSTRACT

The recent revolution in information and communication technologies has changed the ways people carry out their day to day activities. Education is one of the fields that has been largely influenced by this revolution. The majority of academic institutions have integrated Electronic Learning either as part or as their full approach to learning delivery. Governments around the world have invested significant resources to integrate the new media in their education systems. Despite these investments and commitment from these institutions, many of the new e-learning systems tend to fail. This has motivated researchers to investigate suitable approaches to overcome these failures. One of the well-known approaches is to identify what so known as Critical Success Factors (CSFs) which are those factors and areas of interests that can potentially have higher impact on the success, or failure, of an e-learning system. This approach has been widely applied areas around the globe and from different perspectives of e-learning systems stakeholders. However, when considering Saudi Arabia as one of the leading countries in Middle East in adopting e-learning base education, very limited research was found in the literature to identify e-learning systems CSFs. This is despite the extensive resources the government invested in encouraging the Saudi institutions to adopt e-learning. In particular, there is a lack of investigative academic research that considers the perspectives of the different e-learning stakeholders in a Saudi context.

Motivated by this gap, this thesis has investigated e-learning CSFs from academic staff, experts, and students in King Saud University. Both quantitative and qualitative research methods were employed to carry out this investigation. The results have shown that the three investigated populations consider different factors to be more important than others. For example, academic staff considered students' characteristics to be the most important while students considered technology infrastructure to be most important. Differences in opinion also emerged between experts and academic staff and experts and students.

This thesis document the first study of its kind that carries out this comparative study between the three main e-learning stakeholders groups concerning the identification of e-learning CSFs. Moreover, this study opens several avenues for future research focusing on this subject.

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CHAPTER ONE: INTRODUCTION

1.1 Background

The current revolution in the Information and Communications (ICT) field has brought dramatic changes to people's lives both on the personal and commercial levels. Other fields such as economy, health, training, manufacturing, and education have evolved significantly over the past two decades. The field of Education, in particular, has witnessed major changes in the way learning and training processes are carried out. Traditionally, education is based on physical attendance of students/ learners to a physical location (a classroom) and they listen to the tutor/lecturer explaining the learning material using physical facilities (blackboards, etc.). The advances in technologies, nevertheless, have introduced new facilities and techniques which have changed that traditional concept of education. The emergence on the Electronic Learning (e-learning) concept was found to reflect the usage of these new technologies in the educational settings. e-learning is now a main focus for most educational institutions on all levels (schools, colleges, universities, etc.). The term e-learning has been defined in different ways by different authors. More detailed discussion of these definitions will follow with the body of this thesis. However, one of the most comprehensive definitions is offered by Sangrà, Vlachopoulos, and Cabrera (2012) and has been widely accepted. According to these authors, *"e-learning is an approach to teaching and learning, representing all or part of the educational model applied, that is based on the use of electronic media and devices as tools for improving access to training, communication and interaction and that facilitates the adoption of new ways of understanding and developing learning"* (p.152).

Benefits of e-learning have been widely discussed in the literature. In universities, for example, e-learning can be applied to deliver learning opportunities and resources to both on-campus and off-campus distance learning students, and is particularly beneficial in settings in which students may be geographically scattered. There is an evidence in the literature that students prefer e-learning approach to education than traditional style of education (e.g. Kelly et al., 2007; Al-Hassan, 2010). e-learning. Moreover, while initial investments in an e-learning system might be high, eventually, the system can aid at provisioning learning to large crowds at lower costs that traditional educational settings. This includes a reduction in the number of staff required to carry the learning process, and a reduction in preparation of learning materials. Furthermore, being recyclable in the sense that the same learning materials can be used over and over, makes the running costs of an e-learning system lower than those of traditional education classrooms (Chandra and Borah, 2012).

Additionally, Hsbollah and Idris (2009) argue that e-learning can help creating a more customised learning than traditional education system in which most students are subjected to the same learning format and same learning materials. In a similar argument, Zhang et al. (2004) argue that e-learning can help create a more learner-centered approach of education. The benefits of e-learning are well attested. Nevertheless, despite the huge growth in e-learning system development, failures in implementing these systems and in some cases a lack of their acceptance by learners and staff members still exists at a high rate. This research project aims to help in the reduction of such failure and lack of acceptance through the identification of the most important factors that affects the usage of an e-learning system in a Saudi university.

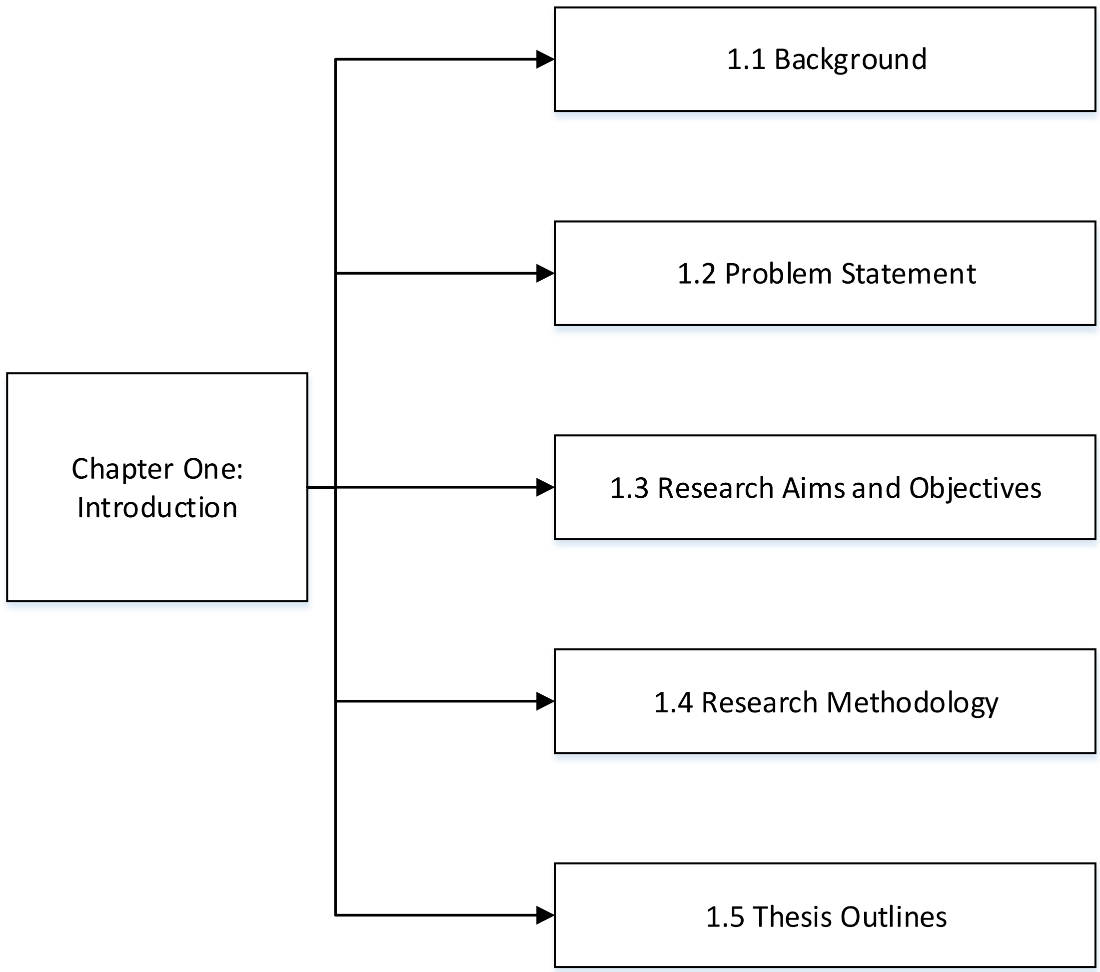

Figure 1.1: Chapter Sections

1.2 Problem Statement

E-Learning has increasingly been integrated into educational institutions. Despite the huge investments in e-learning systems in both developed and developing countries, a low level of uptake of these systems by learners is common. Many researchers have sought to contribute to solving this issue by identifying the most important factors influencing adoption and use, otherwise referred to as Critical Success Factors (CSFs). The concept of critical success factors originates in the organizational strategy literature, and is defined, for instance by Bruno and Leidecker (1984: 24) as *"characteristics, conditions or variables that, when properly sustained, maintained, or managed, can have a significant impact on the success of a firm competing in a particular industry"*. In addition, CSFs are also defined as *"those factors addressed significantly to* *improve project implementation chances"* (cited in Amberg, Fischl and Wiener, 2005). Cheawjindakarn, Suwannatthachote, and Theeraroungchaisri (2012) have described CSFs in the area of Online Distance Learning, which can be considered as a sub-field of e-learning, as 'the areas that must be critically taken care of if institutions that needs success' (p.62). It is believed that the identification of these CSFs can help in eliminating many of the obstacles and challenges the e-learning system in general face when it is put to use by the potential users. Usually, these factors include technical, pedagogy, cultural, demographical factors. Significant number of research works and articles have focused on the identification of these factors in different contexts. For example, the works presented by Selim (2007), Mosakhani and Jamporazmey (2010), Alkharang and Ghinea (2013), and Caporarello and Sarchioni (2014). Some studies have focused on a specific type of factors, (e.g. technical), but those that acknowledge that there are a wide range of different factors (e.g. learner characteristics, training, technical infrastructure) at work are of particular interest. Acknowledging the variety of e-learning systems CSFs is believed to help increasing the chances of these systems by focusing on all these types of factors.

This study uses as its context e-learning in Saudi Arabia. Saudi Arabia is a large country with a significant and growing higher education system (Aljubaili, 2014). The Saudi government has been proactive in supporting the development of e-learning for both students on traditional courses and for those engaged in distance learning courses (Al-Dosari, 2011). The National Center for e-learning and Distance Learning (NCDEL) is prominent amongst similar centres in other parts of the Middle East and the Arab World, and has been pro-active in promoting and supporting the adoption of e-learning in academic institutions. Whilst there is a growing literature on e-learning projects and on the effect of e-learning on student performance in Saudi Arabia (Al-Asmari and Khan, 2014), there are only a few studies that specifically explore e-learning CSFs in a Saudi context. The most comprehensive of these was conducted by Fryan and Stergioulas (2012) and aimed at identifying e-learning CSFs in Saudi academic institutions. On the basis of a literature review they identified 39 e-learning CSFs grouped into the four categories: individual, social, economic, and organizational/governmental factors. Through empirical research using interviews and questionnaires in five different Saudi universities and training centres, they found general agreement between the results of their literature review and their empirical data, although their empirical study identified an additional 13 e-learning CSFs to those found in the literature, whilst six other factors from the literature were found to be of no importance. In summary, Fryan and Stergioulas (2012) identified 52 different e-learning CSFs that are relevant to the Saudi context within the 4 categories found in the literature review. While Fryan and Stergioulas (2012)'s work is important, their study overlooks one major category that is evident in the literature, support, and their investigation of the important categories of student and instructor characteristics was limited. In addition, they made no attempt to evaluate the relative importance of the different factors.

Two studies that have been conducted on e-learning CSFs in Saudi Arabia both have limited scope, focusing on the technical and management aspects of the e-learning system, with little reference to learners, their teachers and learning processes. Altameem (2013) in 2005, used a qualitative case-study-based approach to identify the classes of technical issues which can affect e-learning systems implementation. These issues are: reliability of the ICT infrastructure; system security; access (on-site and off-site); and, availability of IT support. Alhomod and Alshafi's (2013) study was slightly wider in its scope, but the focus remained on the technical staff perspective of e-learning CSFs. Conducted at King Saud University, the study identified the following CSFs, in the following order of importance: sufficient user training, organisation commitment, management support, technical support, positive attitude of users, easy to use tools, sufficient training for engineers, sufficient e-learning initiatives, sufficient manpower, availability of information on the e-learning website, support from other departments. In addition, it is useful to also refer to the literature review by Al-Asmari and Khan (2014) that, rather than discussing success factors, considers obstacles. In a wide-ranging review, they identify the following categories of obstacles to e-learning in Saudi Arabia: technical, material and financial, and organizational and administrative.

Overall, the scarcity of studies on CSFs in e-learning in Saudi Arabia and the limitations of the existing studies, suggests that there is scope for further research, to explore not only the relevance of specific CSFs in Saudi Arabia, but also to comment on their relative importance and to provide more general insights into the reasons behind their importance. In addition, it would be useful to understand whether there is anything unique about the Saudi Arabian context that might impact on e-learning adoption and success.

Based on the above description, this research project aims to identify the CSFs that are believed to affect the usage and acceptance of e-learning system in Saudi universities. The research scope will not be limited to a certain dimension or class of these factors; it aims to identify all types of CSFs in concern. Furthermore, project will also attempt to investigate the viewpoints of as many involved parties as possible; namely, the e-learning experts, academic staff, and students. Thus, the contributions of this research project fall into two categories; first, it expands the research on e-learning systems CSFs by considering all possible factor; and second, it expands the research on e-learning systems CSFs in a Saudi context where such research is limited.

1.3 Research Aims and Objectives

As evidenced by the literature in the previous section, very limited research has been directed towards investigating the factors that affect the usage, implementation, and acceptance of e-learning systems in KSA. The main aim of this research project is to focus on studying these factors from the viewpoints of different involved parties in the process. The research aims at contributing to the local and global knowledge about e-learning CSFs which will help develop and employ e-learning systems more efficiently and effectively. The project aims to develop several theoretical frameworks that identify the sought factors according to the different viewpoints of the involved parties. Given this project overall aim, the research project addresses the following research questions:

a. What the critical success factors that influence the usage and acceptance of an e-learning system in KSA?
b. How do these factors change between experts, academic staff, and students?
c. How do the demographics of the study population affect their perceptions of e-learning CSFs?

To answer these research questions, the following research objectives are defined

a. To critically examine the development of e-learning system as presented in the literature with CSFs as a main focus of that examination.
b. To conduct a qualitative preliminary study to gather knowledge on e-learning in SA from the point of view e-learning experts.
c. To conduct a quantitative empirical study to obtain point of view of academic staff, experts and students on the eLearning CSFs.
d. To develop theoretical frameworks that depict the viewpoints of academic staff, experts and students on e-learning CSFs.
e. To contrast the viewpoints of academic staff, experts and students on e-learning CSFs.
f. To draw a set of conclusions and recommendations based on the results of data analysis

1.4 Research Methodology

An academic research study, according to Mertens (2005), is an investigation that targets data collection, analysis, and interpretation of that analysis and the goal is to "understand, describe, predict or control an educational or psychological phenomenon or to empower individuals in such contexts" (p.2). In order to do so, the researcher should choose a set of research methods that he/she believes they will help achieving the overall aim and objectives of the research study. In this research project, two stages of research have been performed; the first stage targets obtaining the viewpoint of experts about e-learning CSFs. In this stage, a qualitative approach is followed. More specifically, experts are interviewed and questioned about their perceptions of the factors which influence e-learning system the most. In the second stage, a quantitative approach is followed to obtain the viewpoints of academic staff , experts and students. Two questionnaires are designed, each suits the study population it targets (i.e. academic staff and experts or students). After each stage, a data analysis process will be carried out then an overall comparison between the results of all groups.

1.5 Thesis Outlines

On the bases of the previous sections, the remainder of this thesis is organised as follows.

Chapter Two: Literature Review

This chapter will focus on reviewing the literature on the issues that concern this research project. More specifically, the main topics reviewed are the e-learning as a concept and its definitions, CSFs, their definitions, and the relevant studies in the field of e-learning.

Chapter Three: Research Context

Chapter three moves from the generics to the specifics; thus, the chapter focuses on e-learning in Saudi Arabia. The Chapter gives a brief overview on the Kingdom in general, its history, its economical and social environment. Special attention will be paid to the ICT field in Saudi Arabia before moving to present the status of e-learning in the Kingdom, its past, present, and potential future. The chapter also present the challenges the e-learning field is facing in the Kingdom. Finally, the Chapter focuses on e-learning CSFs in the Kingdom and presents the knowledge gap that this research project has set out to fill.

Chapter Four: Research Methods

On the bases of the expanded knowledge regarding the Saudi context and the e-learning CSFs in Saudi Arabia gained in Chapter Two and Three, Chapter Four proposes a set of research methods that are believed to be suitable for collecting and analysing adequate data from the study population. In particular, the chapter argues for using quantitative research methods as means to collect data from three samples of the population study that represent academic staff, experts and students. The Chapter also presents the design of a questionnaire. The chapter also shows how that questionnaire has been modified to suit the different samples and based on the pilot studies conducted.

Chapter Five: Research Design

This chapter focuses on presenting the research methods that are used to conduct the research project. The chapter can theoretically be divided into two parts; the first part presents theoretical background about research methods in general; the paradigms, approaches, and techniques. A set of these methods is argued to be more suitable to be used to carry out this research project. This set is presented in detail and the argument for selecting each method in that set is provided. The chapter also presents different pilot studies that have been carried out to check the suitability of the data collection instruments.

Finally, the chapter briefly presents a set of ethical consideration that the research is committing himself to respect while carrying out this research project.

Chapter Six: Preliminary Investigation

Chapter Six presents the first stage of this academic research project by showing the process and results of collecting and analysing data about e-learning CSFs from experts in three different Saudi universities. The chapter gives detailed information about the sample members, the universities, the roles they play in these universities. The chapter aims to build background knowledge about e-learning CSFs in these universities as a preparation step towards the second stage.

Chapter Seven: Research Findings

The seventh chapter of the thesis presents the results of analysing the data for each sample. The chapter organised by the sample in the sense that the results of Exploratory Factor Analysis (EFA) is presented first followed by the results of Confirmatory Factor Analysis (CFA) and then a discussion of these results is presented lasts. The chapter concludes with the brief comparison of the results of the three samples data analysis.

Chapter Eight: Discussion

To put the results of this research project into perspective, Chapter Eight takes the outcomes of Chapter Seven for each sample and compares it with the relevant literature. The comparison in chapter Eight in conducted on two levels. On the factors as whole level and then on the level of each item loaded to that factor. Moreover, the comparison is done with the results of other samples and with the results of other research works.

Chapter Nine: Conclusion

The last chapter of this thesis aims to summarise the work done in the project. It starts with reiterating the starting motivations to conduct the research followed by an overview of the reached outcomes. The chapter then draws some lessons and practical implications of these results and how they can be translated in a practical sense. The chapter also points out some of the limitations of the work done and how it can be used as a guide for future research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The e-learning concept emerged to reflect the use of technology in the learning process. A major point where e-learning has gained popularity is the emergence of Internet as it offered many tools, information and other resources that are beneficial in the e-learning environment. UNESCO (2002) argues that using technology in the learning process aids in achieving more efficient and effective learning outcomes without the constraints of time and place limitation, which the conventional education suffers. Furthermore, e-learning offers a number of educational advantages, for example, its flexibility is considered to be a contemporary approach that supports teaching and the learning environment (Mylonas et al., 2004). In addition, e-learning supports professional development and best practice via the use of Internet tools that provide 'rich-technology' to classroom activities (Margolin et al., 2011).

Due to these advantages, e-learning has attracted the attention of educational institutions and governments in both developed and developing countries, especially with regard to adapting it to the classroom environment (Guri-Rosenblit, 2005). Adopting e-learning based education has accelerated over the past two decades globally. For example, according to Allen and Seaman (2011) who cite The Sloan Consortium Report, 6.1 million United States students enrolled in an e-learning based course in the fall of 2010. Moreover, the authors claim that 65% of American educational institutions consider e-learning based education as an essential part of their educational programmes (Allen and Seaman, 2011). Globally speaking, between 35% and 40% of educational institutions have adopted a form of e-learning based education in their learning processes (Al-Marabeh and Mohammad, 2013).

Despite many successful experiences with implementing e-learning systems, the progress of such adoption is still slow (Frimpon, 2012). Moreover, even after an e-learning system is adopted, the rate of dropping out from e-learning based courses are higher than dropout rates from conventional classroom-based courses (Andersson, 2008; Rostaminezhad et al., 2013). According to Rostaminezhad al. (2013) and Sun et al. (2008), 20% to 40% of students enrolled in e-learning based courses end up dropping out. Frimpon (2012) argues that a main reason for such dropouts are the misunderstanding (e.g. expectations vs reality) that guide the implementation and adoption of e-learning systems. Sela and Sivan (2009) claim that the failure rate of e-learning systems has reached around 30%.

To enhance adoption and continued use of e-learning systems, the design, implementation and on-going development of e-learning systems requires attention so that possible challenges and obstacles can be eliminated or at least reduced. Such obstacles and challenges could be technical, cultural, or human. An approach which has been recommended in the literature to enhance the chances of improving the chances of e-learning systems is to identify the factors that have a higher influence on the implementation and adoption of these systems. These are referred to as Critical Success Factors (CSFs).

Before delving into more technical terms and issues this thesis focuses on, this chapter lays the background knowledge about e-learning as a new emergent concept, its characteristics, benefits, and its CSFs. This review provides an essential background context to the research undertaken in this thesis.

To achieve this aim, the remaining of this chapter is organised as follows. Section 2.2 surveys the literature for available definitions of the e-learning concept itself. This topic has been a subject for a lot of discussion in the literature. Section 2.3 focuses on modes of e-learning systems. 2.4 presenting the main advantages and benefits that can be gained by adopting and e-learning based education. Section 2.5 attempts to identify the generic challenges and obstacles adopting an e-learning system process can face. Section 2.6. reviews the possible approaches which has been discussed in the literature for studying information systems implementation and adoption. Section 2.7 presents a general discussion of how Critical Success Factors (CSFs) have been defined in the literature as a general concept and then elaborates on reviewing previous studies which identified CSFs for e-learning. Section 2.8 provides a general framework for the most echoed categories and e-learning CSFs in the literature. This topic is elaborated on in further details in section 2.9 where studies that identified CSFs for e-learning in contexts different from the one this research study is being implemented in (i.e. Saudi context) are discussed with a brief discussion of their results are presented. The chapter is summarised and conclusions are drawn in section 2.10.

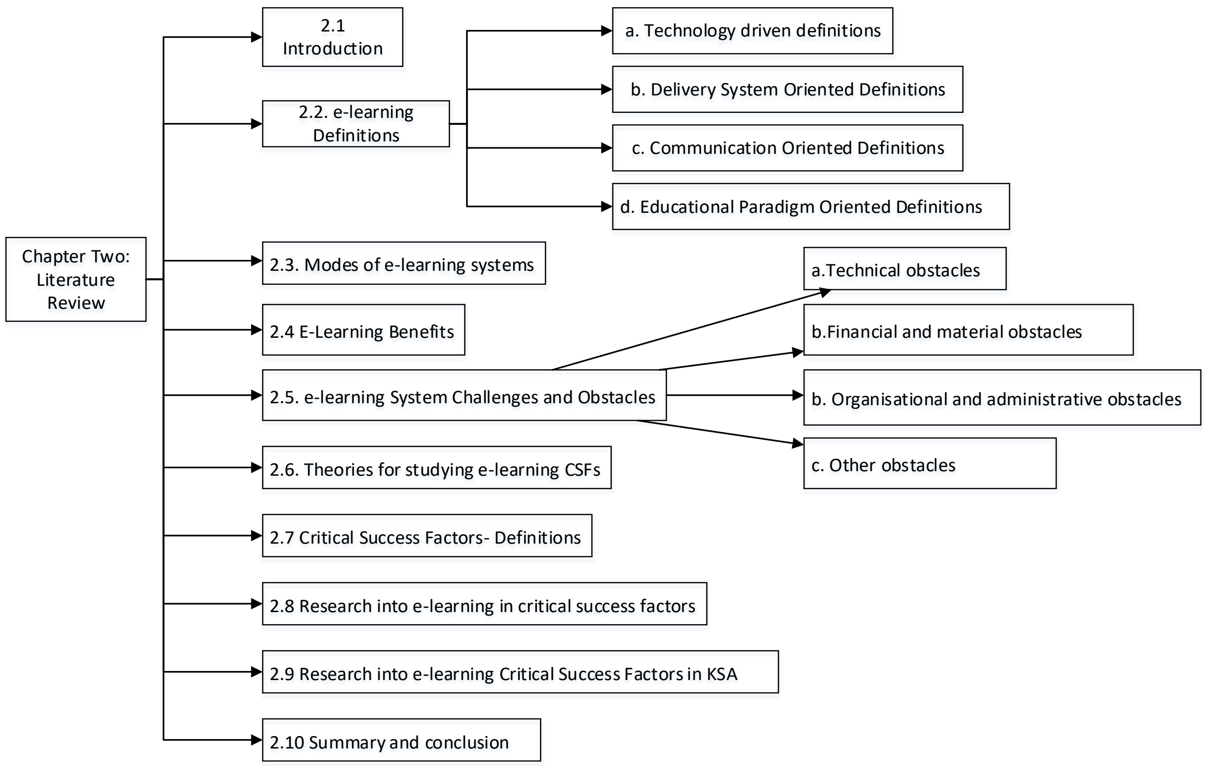

Figure 2.1: Chapter Sections

2.2 e-learning Definitions

Over the past two decades, using technology to facilitate learning became a central attention point of many researchers and theorists in the education and computer science fields. This is mainly due to the rapid advances in the technology field (Guri-Rosenblit, 2005). More specifically, the 1990s have witnessed dramatic improvements on the quality of the multimedia based educational programmes. The early 2000s have also witnessed the appearance of the Internet which played a massive role in transforming how many people nowadays learn. Based on these advances in the technology, the overall general educational environments have changed to reflect these advances (Mylonas et al., 2004). The e-learning concept has been coined by researchers to reflect the usage of technology in education. However, over the years, different terms and names were used to reflect the usage of technology in education; examples of such terms include Computer Based Learning (CBL), Technology Enhanced Learning (TEL); Web Based

Learning (WBL), Online Learning (OL), Mobile Learning (ML), and many others. In this research project, the term e-learning will be the main term used to refer to all these types of learning. Some reference to other terms might be used when citing other researchers' works.

Defining e-learning has been a subject of debate since the concept was coined. Many different definitions have been proposed in the literature for the term. This is mainly due to the emergence of e-learning concept in different academic and scientific fields (e.g. Computer Science, Information Technology, Education, Education Technology, etc.); thus, there are different perspectives of how it is being looked at. Different authors have attempted to survey the literature for definitions. For example, Romiszowski (2004) has found over 20 different definitions for the term e-learning. He states: *"..But as I managed to count more than 20 different definitions in the 50 articles, the chances of an author's understanding exactly matching that of the majority of the other are very low—unless the specific definition to be used is actually stated in the article*"(p.6).

A more recent study which was conducted by Sangrà, Vlachopoulos, and Cabrera (2012), has also attempted to survey the literature for available definitions in order to build a comprehensive definition of e-learning. According to the authors, they have conducted a rigorous scan of all possible sources such as journal, conference papers, books, books chapter, online resources (e.g. Blogs, etc.). The collected definition have been studied and categorised based on their attributes. The result of that analysis has yielded four different types of e-learning definitions as follows.

2.2.1 Technology Driven Definitions

This category mostly includes definitions from private companies and a few academics that emphasise the technological aspects of e-learning, while presenting the rest of its characteristics as secondary. The definitions in this category portray e-learning as the use of technology for learning.

2.2.2 Delivery System Oriented Definitions

This category presents e-learning as a means of accessing knowledge (through learning, teaching, or training). In other words, the focus of these definitions is the accessibility of resources and not the results of any achievements.

2.2.3 Communication Oriented Definitions

This category considers e-learning to be a communication, interaction, and collaboration tool and assigns secondary roles to its other aspects and characteristics.

2.2.4 Educational Paradigm Oriented Definitions

This category defines e-learning as a new way of learning or as an improvement on an existing educational paradigm.

The following tables were produced based on a scan of the literature for an up to date list of all available e-learning definitions and to categorise them based on Sangrà, Vlachopoulos, and Cabrera (2012) categorization.

Definition	Author(s)	Country
''the appropriate application of the internet, and internet technologies, to support the delivery and management of learning, skills and knowledge''	Henry (2001)	UK
"the use of technology to manage, design, deliver, select, transact, coach, support and extend learning of all kinds"	Masie (2001)	USA
''a technology-based solution to the provision of learning in the digital age and seek to use technology in its changing forms to provide us with alternative to traditional class-based teaching''.	O'Reilly (2004)	Ireland
"the delivery of a learning, training or education program by electronic means. E-learning involves the use of a computer or electronic device—in some way to provide training, educational or learning material"	Maneschijn (2005)	South Africa
"e-learning is a boarder concept (than online learning),……the term e-learning is now used in the Framework to capture the general intent to support a board rang of electronic media (Internet, intranets, external, satellite broadcast, audio/video interactive TV and CD-ROM."	Backroad Connections Pty Ltd (2003)	Australia
"learning supported by digital "electronic" tools and media"	Pinkwart, et al. (2003)	Germany
"the use of any of the new technologies or applications in the service of learning or learner support."	Laurillard (2006)	Canada
"e-learning is the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full substitution for the face-to-face meetings by online encounters"	(Guri-Rosenblit, 2005).	Israel
"E-learning is the delivery of a learning, training or education program by electronic means"	Li, Lau, and Dharmendran (2009)	UK and China
"instructional content or learning experience delivered or enabled by electronic technologies including the Internet, intranets, and extranets"	Ong, Lai and Wang, (2004)	Taiwan,

Definition	Author(s)	Country
''the appropriate application of the internet, and internet technologies, to support the delivery and management of learning, skills and knowledge''	Henry (2001)	UK
“the use of technology to manage, design, deliver, select, transact, coach, support and extend learning of all kinds”	Masie (2001)	USA
''a technology-based solution to the provision of learning in the digital age and seek to use technology in its changing forms to provide us with alternative to traditional class-based teaching''.	O'Reilly (2004)	Ireland
“the delivery of a learning, training or education program by electronic means. E-learning involves the use of a computer or electronic device—in some way to provide training, educational or learning material”	Maneschijn (2005)	South Africa
“e-learning is a boarder concept (than online learning),……the term e-learning is now used in the Framework to capture the general intent to support a board rang of electronic media (Internet, intranets, external, satellite broadcast, audio/video interactive TV and CD-ROM.”	Backroad Connections Pty Ltd (2003)	Australia
“e-learning is online training that is delivered in a synchronous (real-time; instructor-led) or asynchronous (self-paced) format”	Jones (2003)	Australia
“A method of education depends on information and communication technologies and multimedia to provide educational content and delivery of skills and concepts of the learner in the active position to interact with the content, teacher and colleagues. Simultaneously or asynchronous in time, space and speed to suit the circumstances of the learner and his ability, and manage all activities of the scientific and the educational requirements in electronic form through electronic systems designed for these purposes.”	Saudi Electronic University (2016)	Saudi Arabia

Table 2.1: Technology driven e-learning definitions

Definition	Author(s)	Country
"e-learning is an umbrella concept, which comrses almost anything related to learning that combines Information and Communication Technology (ICT)	Bates (2005)	Canada
"E-learning is the continuous assimilation of knowledge and skills by adults stimulated by synchronous and asynchronous learning events and sometimes Knowledge Management outputs, which are authored, delivered, engaged with, supported, and administered using Internet technologies."	Morrison (2003)	UK
when,"... someone is learning in a way that uses information and communication technologies (ICTs), they are using e-learning"	Department for Education Skills in UK (2003)	UK
"..the delivery of individualized, comprehensive, dynamic learning content in real time, aiding the development of communities of knowledge, linking learners and practitioners with experts"	Stojanovic et al. (2001)	Germany
"E-learning is the delivery of education (all activities relevant to instructing, teaching, and learning) through various electronic media"	Koohang andHarman (2005).	USA
"E-learning is an on-line education defined as the self-paced or real-time delivery of training and education over the internet to an end-user device"	Lee and Lee (2006).	Korea
"the use of Internet services to provide the instructions for teaching"	Rahmat and Mohd-Saudi (2007)	Australia
"e-learning system is an information system based on the World Wide Web that provides training of learner in a flexible way"	Lee and Lee (2008)	Korea
"E-learning can be defined as technology-based learning in which learning materials are delivered electronically to remote learners via a computer network"	Zhang et al., (2004)	USA
"E-learning is seen as a tool for raising the number of students who have access to higher education, especially marginalized groups in rural areas, by being a cheaper and more flexible alternative"	Andersson and Grönlund (2009)	Sweden
e-learning is defined as web-based learning which utilizes web-based communication, collaboration, multimedia, knowledge transfer, and training to support learners' active learning without the time and space barriers	Lee and Yoon (2009)	South Korea
"E-learning is defined as education delivered, or learning conducted, by Web techniques"	Liao and Lu (2008).	Taiwan

Table 2.2: Delivery system oriented e-learning definitions

Definition	Author(s)	Country
"E-learning is education that uses computerised communication systems as an environment for communication, the exchange of information and interaction between students and instructors"	Bermejo (2005)	Spain
"E-learning is defined as learning facilitated by the use of digital tools and content that involves some form of interactivity, which may include online interaction between the learner and their teacher or peers"	Ministry of Comms and Technology of New Zealand (2008).	New Zealand
"E-learning system is a learning technology that uses web browsers as a tool for interaction with learners and other systems. This system works as a platform to facilitate teaching and learning"	(Ferdousi, (2009)	United States

Table 2.3: Communications oriented e-learning definitions

Definition	Author(s)	Country
"E-learning is the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services, as well as remote exchange and collaboration"	Alonso et al. (2005)	Spain
"E-learning is a broad combination of processes, content, and infrastructure to use computers and networks to scale and/or improve one or more significant parts of a learning value chain, including management and delivery"	Aldrich (2005)	USA
"E-learning is defined as information and communication technologies used to support students to improve their learning"	Ellis, Ginns, and Piggott (2009).	Australia
"E-learning refers to educational processes that utilise information and communications technology to mediate synchronous as well as asynchronous learning and teaching activities"	Jereb and Šmitek (2006)	Slovenia
"E-leaning refers to use in Internet technologies to deliver a board array of solutions that enhance knowledge and performance."	Rosenberg (2001)	USA
"an education which delivered (a) instructional goals, (b) specific instructional methods, (c) selected media, and (d) knowledge and skills for achieving individual or organizational goals."	Uzunboylu (2007)	Cyprus

Table 2.4: Educational Paradigm Oriented e-learning definitions

As the tables above show, the available definitions for e-learning in the literature mainly focus on the e-learning system themselves rather than the learning itself. The technology used and the delivery approach are the main drivers for the definitions of e-learning in the literature. This is evidenced by the number of definitions proposed in the literature based on these aspects e-learning as it was shown in the above tables. Sangrà, Vlachopoulos, and Cabrera (2012) have presented their categorisation to experts in the field of e-learning to vote the one they believe it represents their view. After several cycles of voting, amendments, and re-voting, the authors have reached a decision that the educational paradigm oriented is the one that represents the view of the majority of the surveyed experts. The authors then presented a suggested definition of e-learning which was agreed by 100% of the experts to represent their view. According to this definition, "E-learning is an approach to teaching and learning, representing all or part of the educational model applied, that is based on the use of electronic media and devices as tools for improving access to training, communication and interaction and that facilitates the adoption of new ways of understanding and developing learning".

This definition will be adopted by this research project for the time being. However, the definition of Saudi educational institutes of e-learning will be compared with it for the purpose of checking if their definitions are influenced by the local and organisational culture and whether these definitions match the universal views of e-learning represented by this definition.

2.3 Modes of e-learning Systems

It was clarified in the definitions section that e-learning can be used to refer to the usage of technological instrument to support or replace the traditional teaching tools and methods. However, when considering full e-learning systems, the approaches and scopes of implementing them can vary between educational institutions. Three different scopes or types of e-learning systems have been discussed in the literature and they are as follows (Al-Fadhli, 2009), (OECD, 2005)

2.3.1 Supplemented Mode

In the first, and the shallowest implementation level of an e-learning system, technology is only supplemental to traditional learning methods; thus, technology only supports the execution of traditional education approaches and methods and does not substitute it. Face to face classrooms and physical attendance of them by student is still the main approach for learning (Tagoe, 2012). These classrooms are the main criteria used for measuring students' attendance and any technology-based activities (e.g. online tools or in class technologies) do not substitute them. Many examples of technology can be used in this mode such as projectors, electronic whiteboards, multimedia devices. A separate website could also be used to support storing, downloading, accessing, and communicating between the students and their instructors. Email communications are another example of these technologies (Harris, Yanos and Zastrocky, 2003).

While it is considered as a mode of e-learning, however, Taha (2014) doesn't consider it as a main type within the main realm of e-learning systems. This is due to the fact that the main pedagogical issues and concerns in the education process are still treated following traditional approaches of education (Bates, 2005).

2.3.2 Blended Mode

As its name reflect, in blended mode a mixture of both physical classrooms and technology-based learning activities (e.g. online courses) are used to measure the students' commitment to learning (Huang, Lin, and Huang, 2010; Jackson et al., 2009).The student's credit is calculated using both types of classes. This will lead to a reduction of traditional classrooms and substitution with online activities instead. In comparison with supplemented mode, the blended mode is deeper and moves the education to be more technology based. With such depth, many requirements come to enable such partial transformation of the education process. Examples of these requirements are a stable technological infrastructure such as networks, course management systems, computer labs, high internet bandwidth, printing facilities and many more. Adopting a blended mode can be also challenging from an administration point of view. Members of staff have to cope with the pressure of both classrooms and online courses. They can be overloaded with such amount of workload. Moreover, the skill set these instructors hold should be enhanced and expanded to allow them to efficiently use and educate through both approaches which can be time consuming and some of them might actually reject the new changes. This is especially true knowing that new software product will be adopted as part of the process which means that these instructors have to master them; such a change could be strongly rejected, especially by older members of staff (Sonia and Eric, 2013).

2.3.3 Full Web-Based Mode

The next level of e-learning system implementation is the full-web based mode in which all or most physical existence of traditional classrooms and approaches disappear and are replaced by technology based education(Steven, 2001; Tarhini et al., 2013). Face to face communications do not exist and are not considered to be necessary anymore and online communication, chat rooms, forums and other technology based communications take over. In rare cases, face to face communication might take place if there is a need, however, the rest of communication and learning activities are done online including the processes of examination, marking, and delivering grades. Learning materials are offered in electronic format including books which are traditionally stored in a physical library. These books and other learning materials substitute the instructors as main sources of knowledge. The students become self-taught to some extent. Communications with the instructor could be conducted to reflect on what the students have taught themselves or to enrich their new knowledge.

The challenges level to adopt a full web-based e-learning system are far greater than those with supplemented and blended mode e-learning systems. The changes required to adopt such a system include a major institutional structure and the adoption of a new organisational structure all together. Moreover, the rules, policies, pedagogies adopted have to be designed to suit the new learning mode. Nowadays, there are several examples of what become known as virtual universities where the full educational process is fully digitalised and done on the web.

2.4 E-Learning Benefits

As it was briefly mentioned in the previous two sections, there was wide spread of e-learning deployment all over the world. Such deployment is mainly motivated by the perceived benefits of these systems in comparison with conventional approaches of teaching and learning for both students and teachers (Al-Marabeh and Mohammad, 2013). This section attempts to briefly cover those benefits to gain a deeper appreciation as to why it is so important to carefully plan the process of implementing and adopting e-learning systems. A crucial part of such planning process is identifying the most critical factors that affect these implementation and adoption processes which is the main concern of this research study.

The list of benefits of e-learning systems are wide in scope and they include cost reduction, more effective learning content, availability anytime and anywhere, allowing students to learn at their own pace, and tailoring for each student’s needs. Surveying the literature shows that the perceived benefits from technology based learning can be summarised in broad categories which are explained next.

2.4.1 More Effective Learning

A main advantage of using e-learning based education is the increase of effectiveness of the learning process in general. Al-Harbi (2010) claims that by using technological utilities such as simulations and multimedia, the cognitive learning skills of the learner can be dramatically enhanced. Khan (2005) agrees with this claim and adds that such technologies provide a clearer platform to support students' learning experiences especially in difficult areas such as data analysis and models manipulations. Different formats of multimedia can also enhance learning gains experienced be the students, according to Al-Harbi (2010). Being flexible and offering different styles of presenting the same learning materials also enhances the effectiveness of learning as it was argued by Jethro et al. (2012). According to the author, some students prefer visual learning, while other could be prefer text or audio-based learning. Having the choice between these different styles allows the students to learn according to their preferred method. Yet another factor which could contribute to increase the effectiveness of e-learning based education is that interactivity is required by students to be able to use the e-learning based contents. This motivates and obliges the students to search for solutions and to identify which method they prefer in line with the guidance they given to them by the teachers (Ibrahim et al., 2007).

Broadly speaking, it has been argued in the literature that using technology will enhance the quality of learning. Dror (2008) argues that TEL system utilize three tools or mechanisms which contribute to such enhancement of the learning quality if technology was used. The first mechanism is Control. According to Dror (2008), when the student has some control on how the learning materials are presented to him or her, it can lead to higher levels of commitments to learning and maintaining higher levels of motivation among these students. Nevertheless, Dror argues that such control should be a balance between keeping the students motivated without involving them into higher levels of technicality which can deter students from learning and overload them with issues beyond the intended learning outcomes. The second mechanism suggested by Dror is Challenge. The transfer from the system to the user should not be a straightforward process of knowledge in a fashion that can get the users bored and unchallenged.

A suitable level of challenge should present in the way and the format the materials are presented. Such challenge can help keep the students intrigued to learn more and use the system more often. Some authors suggest that designing the systems or some part of it to adopt a gaming approach in style and materials presentation fashion can help achieving the challenge goal. The final mechanism suggested Dror (2008) is the students' Commitment. As it can be noticed that the three mechanisms start by the letter C which is why they are usually referred to as the 3Cs. According to Dror, fulfilling the Control and Challenge mechanisms can help increasing the levels of students Commitment to learning using technology.

2.4.2 Enabling Interaction and Communication

One of the main enhancements incorporating technology in any organization can add is the improvement and ease of communication between the involved parties. This is particularly true for the case of adopting e-learning system. Mahdizadeh et al. (2008) compares communications between students and their teacher in the conventional educational system and e-learning based education system. According to the author, the direction of communications in an e-learning based system is not one directional from the teachers to the students in the form of instructions and requirements. Collaboration between the students and teacher is more evident in the case of e-learning based education system (Mahdizadeh et al., 2008). Such interactivity of communications is always supported by the variety of audio and video technologies which helps building a more robust relationship between the two sides (Al-Adwan and Smedley, 2012).

An immediate impact of adopting e-learning system is the change of the roles played by the teachers and students, just as it was the case in the communications described above. The change nevertheless, also impacts the collaboration in the learning process itself such as the students' participation in the online discussions either between the students' themselves or between them and their tutors. These discussions put bigger responsibility on the students in their academic success more than it is the case with conventional learning (Dargham et al., 2012). The teachers themselves also get higher responsibilities in terms of motivating the students to participate and use the available resources to achieve the learning goals from the course in concern. They are also required to design the contents of e-learning based courses to suit the needs and achieve the sought learning outcomes (Dargham et al., 2012). These interactions with their teachers by the students enhances the students learning performance as it was argued by Yongsheng et al. (2012).

2.4.3 Allowing More Flexible Education

Adding more options and alternative ways to learn is one of the essential advantages that adopting e-learning system adds to the learning environment. Moreover, removing the physical and geographical barriers is one of the clearest advantages for e-learning based education as it is agreed by many researchers in the literature (e.g. Alkharang and Ghinea, 2013; Al-Harbi, 2010; Odunaike et al., 2013).

These advantages allow more flexible learning than conventional style of education. Such flexibility contains additional aspects which help the students to learn better, more effectively, and in more comfortable fashion. In this sense, Reeves (1998) argues that a Technology Enhanced Learning (TEL) system could be either used to learn via or from the system. When it comes to learning from the system, it behaves as a supporting medium for the learning process where the materials are being offered to the students and teacher to use as a substitution of physical alternatives (books, blackboards, etc.). The TEL system in this case could be any technological package. Following this fashion, the user has full control over the system (Chan et al., 2006). On contrast, learning from the system, the TEL system, the system shows the users how to solve the issue at hand or help them increase their knowledge volume concerning a certain topic or issue.

2.4.4 Catering for Student Needs

Given its availability and the various ways in which the learning materials can be presented to the users, several authors have advocated that these properties make using technology in learning more suitable for special situations where the traditional learning environment does not provide the students' needs. One example of these situations is when the student does not receive enough attention from the teacher due to certain reasons (such as in overcrowded classrooms;). In such a case, technology based learning could be a suitable substitute as it can be used according to the students' pace and without the pressure of having to keep up with his peers. Moreover, the students can use the e-learning system whenever and wherever they like without having to be in a certain classroom setting as in conventional learning (Chan et al., 2006). Another example of such situations are students with special needs who can not use or follow standard curriculum and always need additional support. Technology based learning can be utilized and designed to suit the needs of these students which can reduce the need for physical human support and may be integrated with any equipment they already use (Ringstaff and Kelley, 2002). Another class of students who can benefit from technology based learning are those gifted students who exceed the levels of their peers in terms of learning pace and knowledge gain. Technology can help these students to explore further knowledge beyond the level of an average students without being limited to the availability of the human teachers or physical resources (Ringstaff and Kelley, 2002).

Based on these arguments from the literature, it is clear that the case of adopting e-learning based education has a strong case. Nevertheless, such case still faces many challenges. These challenges are briefly overviewed in the next section.

2.5 e-learning Systems Challenges and Obstacles

While the previously mentioned benefits and advantages of e-learning systems are well attested by both practitioners and theorists in the field, these systems face many challenges before, during, and after they are adopted. Moving from conventional style of learning to a technology based one requires many conditions to be modified so that this adoption is successful. This topic has been investigated by several researchers (e.g. Bhuasiri et al., 2012; Abdelraheem, 2006; Andersson, 2008). The list of obstacles and challenges that face the success of an e-learning system varies from human challenges, to financial challenges, to technology suitability and availability. It can be notable that the discussion in the literature in different cases of researcher overlaps with some of e-learning CSFs as they will be discussed later in this chapter. Moreover, most of the discussion about e-learning system challenges come within general discussions about e-learning systems. Yet a final observation is that e-learning system obstacles come in a wide range of dimensions which is mainly due to the wide range of requirements, changes and resources needed to successfully implement an e-learning system (Andersson, 2008).

Some researchers have attempted to categorise the challenges that face the adoption of an e-learning system. Andersson and Gronlund (2009) suggests seven categories of these system and they are Human (users, developers, managers, etc.), technological, institutional and organizational, environmental, managerial and pedagogical, and ethical. Alkharang and Ghinea (2013) suggest a shorter list of three categories and they are management, technical, and language concerns. Rhema and Miliszewska (2010) also adds another categorisation of these challenges and suggests five types of these challenges and they are cultural considerations, language issues and concerns, students' motivations and awareness, the attitude towards e-learning, technical, management support, and pedagogical development concerns.

Islam, Beer, and Slack (2015) argue that most of the research in the literature has focused on challenges and obstacles from students' perspective; to fill this gap, they reviewed the literature to check the research works which focused on academic staff perspective on using e-learning systems challenges and obstacles. The authors have categorised these challenges into five categories and they are: (a) learning style and cultural challenges which focuses on tailoring the supplied learning material according to the learning style of the individual student and to consider any cultural differences that might affect the students interaction with the system; (b) pedagogical e-learning challenges which is related to the first challenge in the sense that it focuses on the importance of pedagogy as a cornerstone to the learning process. This means that academic staff are required to acquire additional skills beyond basic technical skills of using the e-learning system and grow them to the extent where technology based learning is guided by pedagogical principles and guidelines. Without that, learning might not be achieved; (c) technological challenges focus on the technical issues that academic staff are faced with when using the e-learning system. Examples of these issues including bugs, instability, and general quality of the deployed e-learning system; (d) technical training challenges which emphasise the importance of providing the suitable technical training for the academic staff who work with e-learning systems. The intensity and duration of such training is relevant to the nature of the job these staff carry out. For example, for an academic staff who performs a 100% distance learning using the system, more intense and deeper training is recommended; (e) time management challenges which occur due to the additional workload adopting an e-learning approach can cause. For example, students expect to receive a response to their questions on the online platform as soon as possible. Moreover, the academic staff is expected to be engaged in the online discussion with the students or to motivate the less active students to get engaged constantly. This can lead to overworked staff which can negatively affect the learning itself.

The main focus of this research project is the Saudi educational context. Obstacles and challenges that face an e-learning system could change due to the environment and local regulation and resources. As it will be presented in great details in the next chapter, the deployment of technologies in general and e-learning systems in particular is rapid. However, the inclusion of e-learning systems as part of the Saudi educational system is still facing several challenges and obstacles. This topic is covered in the next section. Several research studies have attempted to identify the obstacles and challenges facing e-learning systems in Saudi Arabia. Reviewing these studies can show some patterns of categories of these obstacles and challenges. The majority of the studies divide the challenges and obstacle into technical, material and financial, and organisational and administrative obstacles and challenges. However, it can be noticed that there are two smaller additional categories that have been discussed but not classified in the literature and they are the legislative or legal and the cultural obstacles. In this chapter, these two categories are presented under the name of 'other obstacles and challenges'. All these categories are briefly presented next.

2.5.1 Technical Obstacles

The physical e-learning technology is now available almost everywhere around the globe and Saudi Arabia is a leading market in technology sales, at least in the region as will be described in further detail in Chapter Three. Nonetheless, a major issue that is facing the integration of e-learning systems in Saudi Arabia is the lack of enough experience of how to smoothly use these tools and technology. According to Al-Shahrani and Al-Shehri (2012), a major issue that lecturers and teachers encounter while using these tool is the many technical problems (disconnections, exchanging emails, etc.) and their lack of knowledge or experience to deal with them.

Yet another problem is the belief among some Saudi educational institutions that investing in e-learning systems could be a waste of time and resources due to the lack of suitable technical infra-structure. This what the study conducted by Al-Asmari (2005) has concluded. Nonetheless, the study is nearly 13 years old and the technical infra-structure in Saudi Arabia has been improved over the past decade. It could worth an attempt to update the investigation on how Saudi educational institutions perceive the investment in e-learning system in 2018.

According to Al-Asmari (2011), another major technical problem that staff members in the Saudi educational institutions face is the handling of technical problems that occur in the computer laboratory. Viruses, disk damages, computers break down, and many other issues occur due to the misuse by students or just by general use. The staff members have to either deal with these issues personally which can consume a great deal of their working hours or rely on the technical support provided by the institution or the Internet Service Provider (ISP) which can also take long to respond and deal with the issue. This demotivates the staff member and reduces their enthusiasm toward using and adopting the e-learning system.

Most of these technical obstacles can be solved through proper organisation of the e-learning system environment. For example, create a support team for each educational institution to deal with any technical problem that might emerge and provide suitable training for the staff member on how to use the e-learning technologies smoothly and efficiently (Olcott and Wright, 1995). Furthermore, encouraging a cooperative environment among staff member in the concerned institution to support each other in dealing with technical issues and improve each other's technical knowledge is a key to motivate and install enthusiasm about the e-learning system (Abouchedid and Eid, 2004).

2.5.2 Financial and Material Obstacles

The Saudi government has dedicated huge resources and initiatives to support the adoption of e-learning phenomenon in the country through the establishment of the National Centre of E-learning and Distance Learning and through dedicating a specific budget for this intention. All these initiatives and support by the government will be discussed in further detail in Chapter

Three. Despite that, there is still a gap between what funds are available and what is required. Many educational institutions in the Kingdom are still struggling with obtaining the essential equipment (networks, laboratories, etc.) necessary for integrating e-learning as a primal part of the education process (Al-Shahrani and Al-Shehri, 2012). More resources and funds are required to improve and expand the infrastructure in the country (Networks, Internet services, etc.) (Al-Asmari, 2005).

Another type of problem is the focus by the government on main cities. According Al-Asmari (2005) and Al-Shehri (2010) there is a focus by the government on educational institutions in the major cities in the Kingdom. Education institutions in rural areas still struggle with the funding, the availability of e-learning materials, and the technological infra-structure in general.

The learners as well still find it hard to cope with the fees of the internet services, the learning materials and many other things which enable them to get involved in an e-learning academic program (Al-Draiby, 2010).

2.5.3 Organisational and Administrative Obstacles

The organisational support and acceptance of e-learning system could be a main obstacle that faces the integration of e-learning in the Saudi educational system. The lack of organizational support has been rehearsed and emphasised by several researchers and it takes several forms. Some examples of such lack of organisational support are the staff members' rejection of the system for various reasons. Some staff members may refuse to use the system due to the feeling that they are not qualified enough to use such a system and they might not deliver the high-quality output they wish to. According to Hussein (2011), there is a lack of qualified staff members in general who can use e-learning systems efficiently and produce high quality education. The problem can also be expanded to include the faculties themselves, according to (Al-Shehri, 2010) who claims that many of these faculties lack the suitable and basic knowledge that is essential to appreciate e-learning in general and they are hesitant to accept it as a new modern method of teaching as they are comfortable with conventional methods.

Another class of staff members who refuse e-learning systems is some of teachers who overly concerned that an e-learning system would substitute their roles and therefore that might lose their jobs if it was adopted (Alwalidi and Lefrere, 2010). Moreover, the bureaucratic attitude and system followed in many Saudi educational institutions makes it harder to implement and adopt these systems, especially that e-learning system might require fast and dramatic changes in the whole structure of the organization and therefore it should rely of speed of decision making.

Most of these issues can be overcome through a suitable strategy that tackles the different aspect of an e-learning environment. For example, training and raising awareness about the benefits and advantages of adopting e-learning style of education could help to motivate different class of staff member and reduces their fear about such adoption (Al-Asmari, 2005, Alkhalaf et al., 2014). Other techniques could include the adoption of rewarding system for staff members who excel at using and promoting the e-learning system. Rewards could include financial and moral supports and increases in salaries and job status for staff members who are actively involved in the process of adopting e-learning in the educational institution (Alqurashi, 2009; Al-Shehri, 2010).

2.5.4 Other Obstacles

There are some other obstacles that have been mentioned in the literature but do not fit under the previous categories. For example, there are some legal barriers that lessen the chances of students benefiting from the advantages of the e-learning system and the opportunities it offers. For example, the Saudi Ministry of Higher Education put a condition on approving any academic degree; the student must physically attend as a full-time student in the country where that degree is obtained. This condition or regulation prevents Saudi students from benefiting from other international universities e-learning degree, if they can not travel due to any circumstances (e.g. financial, health, family commitments) and it also prevents international students to benefit from the academic degrees the Saudi universities offer through distance learning if the students can not travel to Saudi Arabia (Al-Mushasha and Nassuora, 2012). Furthermore, for any student who is looking to get enrolled in a PhD programme, he legally has to be totally dedicated to that programme; thus, he or she can not have a job while studying for a PhD degree. This puts a further burden on the shoulders of the students in general and reduces the chances that they get involved in PhD programmes offered through e-learning systems (Hiltz and Turoff, 2005).

Culturally speaking, there is a disbelief in the quality of the e-learning systems and the output they produce. This includes some of the academics who work with these systems, according to (Al-Draiby, 2010). According to the results of his study, Al-Draiby claims (2010) that only 9.5% of the surveyed academics believe that e-learning systems in the Kingdom are of high quality.

2.6 Theories for Studying e-learning CSFs

Many theorists have attempted to investigate different aspects of e-learning systems implementation on different stages of that process. Some studies have focused on investigating the pre-implementation stages, others focus on identifying the determinants of adoption and usages of these systems. Reviewing the literature reveals five main theories which were used for these purposes. These theories are Technology Acceptance Model (TAM), Information System Success Model (ISSM), Social Cognitive Theory (SCT), Motivation Theory (MT), and Critical Success Factors (CSF) identification approach. These theories are described in turn in the following subsections.

2.6.1 Technology Acceptance Model

The Technology Acceptance Model (TAM) is one of the most famous and used models in Information Systems (IS) literature (Alenezi, 2011). TAM was originally proposed by Davis (1989) to measure the ease of use, and usefulness of and IS. Since its proposal, TAM has gone through several extensions (TAM 2, UTAUT, and TAM 3). The main four components of TAM are the perceived usefulness, perceived ease of use, attitude towards using, and behavioural intention to use the system in concern. Considering the external variable impacts on these components gives the researcher the actual use of the system being investigated. In brief, TAM investigates the user's acceptance of a certain IS. Figure 1 depicts these constructs and the relationships among them.

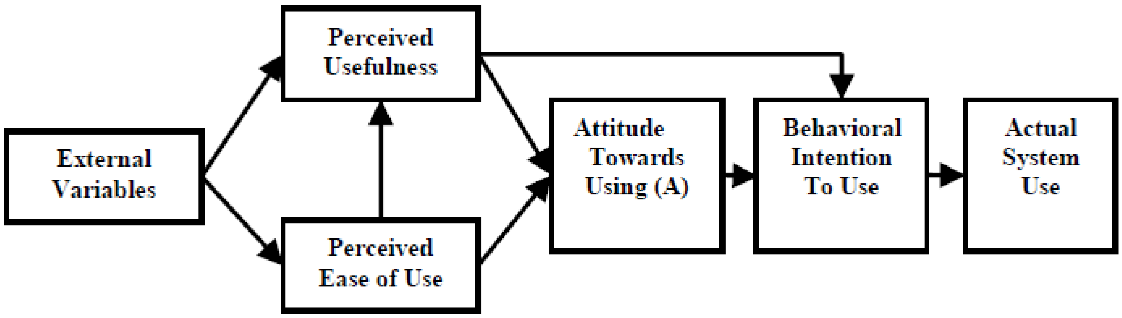

Figure 2.2: Technology Acceptance Model (TAM) (Davis, 1989)

TAM, in its original structure, has been used to study the acceptance of many types of IS. This includes e-Mail systems, e-Government systems, e-Banking, and many others (Deng et al., 2005). Several researchers have integrated TAM with other theories to measure the acceptance of specific types of systems. For example, to study the acceptance and adoption of e-Government systems by citizens, Warkentin et al. (2002) have integrated TAM with trust, culture, and other theories. In terms of e-learning systems acceptance measurement, several researchers (e.g. Sheng, Jue, and Weiwei, 2008; Liu, Liao, and Pratt, 2009) have used TAM. All these studies agree that system's ease of use and its acceptance by the users play a major role in these users' behavioural intention to actually use the e-learning system being investigated.

2.6.2 Information System Success Model (ISSM)

One of the most known models in the IS literature is Information System Success Model originally proposed by DeLone and McLean (1992) and then altered by the same authors in 2003. According to the amended model, there are six constructs that specify the success of an IS system and they are: net benefits, intention to use system, user satisfaction, system quality, information quality and service quality (DeLone and McLean, 2003). The latter three constructs are independent variables. Wang and Wang (2009) define these three independent variable constructs in context of e-learning as follows: System quality refers to the availability of help functions in the e-learning systems which can the user to facilitate learning through the system. Information quality refers to the enhancements in the users' knowledge as a result of using the e-learning system. And lastly, Service quality refers to the providence of a suitable support so the user can obtain optimal usage of the e-learning system.

Focusing on e-learning systems success, Chiu, Chui, and Chang (2007) and Roca, Chiu, and Martínez, (2006), Wu et al. (2010), Chen (2010), Lin (2007), Ozkan and Koseler (2009), and Wang and Wang (2009) are some of the research studies that used Information System Success Model to evaluate and examine e-learning system and the relationships between the different constructs.

2.6.3 Social Cognitive Theory

The main aim of Social Cognitive Theory is to analyse the human behaviour, predict his or her potential actions, and explain the reasons behind any changes in humans' behaviour (Yi and Hwang, 2003). In terms of IS literature, the SCT has been used to study the end users' adoption of an IS system. More specifically, the theory attempts to study how the environmental and personal factors impact the users' decision whether to adopt or not adopt an IS system. Furthermore, the SCT identify two key elements which influence the human behaviour and they are: the outcomes expectations and users' self-efficacy (Gong, Xu, and Yu, 2004). Outcome expectation is the users' internal belief that they will achieve a certain outcome through using the system in concern while self-efficacy is the internal user's belief that they have the technical maturity and the required skills to optimally use that system (Henry and Stone, 1994). These two key have been found to be influential on the users' decision to use the IS system and the intention behind that use. These two determinants affect each other. More accurately, the self-efficacy is important in the SCT as it can affect the outcome expectations (Yi and Hwang, 2003). Several studies have used SCT to study the users' satisfaction with e-learning systems. These studies include the works of Hussein et al. (2007), Wu et al. (2010), and Brown (2002).

2.6.4 Motivation Theory

According to Ryan and Deci (2000), the motivation theory specifies two main types of motivation: intrinsic and extrinsic. Intrinsic motivation stems from the joy a doer gets from carrying out a certain activity, while extrinsic motivation refers to the enjoyment of achieving a certain goal or purpose by carrying out an activity (Meyer and Gagné, 2008). Law, Lee, and Yu (2010) and Sheng et al. (2008) have used the motivation theory to study the role of motivation on the use and acceptance of an e-learning system. According to both studies, intrinsic and extrinsic motivation types play an important positive role in students' self-efficacy and their behavioural intention to use the e-learning system.

2.6.5 Critical Success Factors Identification

The last and most used theory to evaluate e-learning system is to identify the factors that have critical impact on the success of the e-learning system. Reviewing the literature shows much more focus on using and discussing this approach by theorists and authors than other approaches and it is different contexts. This research project follows this approach and therefore the remaining parts of this chapter will focus on different aspects of e-learning CSFs.

2.7 Critical Success Factors-Definitions

Rockart (1979) cites a definition for CSFs which was originally proposed by Daniel (1961) and Anthony et al. (1972) who defined these factors as the *"the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization".* Another definition of CSFs was proposed by Bruno and Leidecker (1984: 24) who defined them as "characteristics, conditions or variables that, when properly sustained, maintained, or managed, can have a significant impact on the success of a firm competing in a particular industry". In addition, CSFs are also defined as "those factors addressed significantly to improve project implementation chances" (Amberg, Fischl and Wiener, 2005).

According to Rockart (1979: 87) applying the CSFs approach "helps the manager to determine those factors on which he or she should focus management attention. It also helps to ensure that those significant factors will receive careful and continuous management scrutiny". Masrom et al. (2008) argue that the results of CSFs identification process should be a set of CSFs that are measurable, controllable, and few in numbers.

Boynton and Zmud (1984) affirmed that the CSFs are those few things, characteristics, conditions, or variables that when properly sustained, maintained, or managed can have a significant impact on the success of the system.

Recently, attempting to identify CSFs for different fields has gained a wide attention from researchers and theorists in these fields. Nonetheless, most of the studies which attempted to classify e-learning CSFs were based on some theoretical theory. The next section looks into the factors that affect the success of an e-learning system implementation as they were presented in the literature.

2.8 Research into e-learning in Critical Success Factors

Investigating and identifying e-learning CSFs has received attention from several authors in the literature. Selim (2007), Puri (2012), Taha (2014), Menchacaa and Bekele (2008), and Musa and Othman (2012) are examples of these research works. An in-depth literature review has been performed. A few of the research works that were found considered as suitable to be included in this literature as they have met simple criteria. First, they have considered one or more of the study populations that this thesis studies (e.g. academic staff, experts, or students); second, they have clearly listed a set of factor or categories of e-learning CSFs as their results so they can be compared to the results of this thesis. Their main focus is to identify e-learning CSFs. Reviewing these research works and many others has revealed certain trends and themes of the conducted investigations.

The first observation, which was noticed while reviewing the literature, is the lack of a unified categorisation of e-learning CSFs. While some authors have divided these factors into five categories (e.g. Menchaca and Bekele, 2008) other have divided them into four categories (e.g. Taha, 2014). Some authors (e.g. Selim, 2007a; Selim, 2007b) have divided them into seven categories. Even in the cases where two or more authors agree on number and names of e-learning CSFs categories; that does not mean agreeing on the actual factors within these categories. For example, both Taha (2014) and Selim (2007a) have a category called students characteristics; while Taha (2014) include 4 factors within this category, Selim (2007a) includes 22 factors within the same category.

Yet another trend is the focus of some researchers on investigating all possible e-learning CSFs from one or more perspectives (e.g. students, students and instructors, experts, etc.) while others have focused on a partial set of these potential e-learning CSFs (e.g. students' characteristics, technical infrastructure, etc.) from one or more perspectives. The work produced by Selim (2007) and Puri (2012) are two examples of attempting to produce a comprehensive list of e-learning CSFs from a certain e-learning users group perspective. On the other hand, Masrom (2008) and Al-Homod (2013) have focused on partial sets of e-learning CSFs; or at least that what their articles titles claim. Masrom (2008) specifies that they investigate the "technological and institutional support" e-learning CSFs. Al-Homod's (2013) article title and description claims that he investigates the technical e-learning CSFs. However, reviewing these two articles shows that the factors which they have considered fall under more than these the categories they claim to investigate. As it is shown in Chapter Five, many of the factors investigated by these authors actually fall under different categories than those they claim to investigate. This observation and the previous one shows a lack of agreement among the researchers and theorists who are interested in investigating e-learning CSFs.

The third observation are the differences in the locations and contexts of the conducted studies. While there are some studies (e.g. Odunaike, Olugbara, Ojo, 2013; Cheawjindakarn, Suwannatthachote, and Theeraroungchaisri, 2012) that provided a generic review of the literature regarding e-learning CSFs, many other had context specific studies. For example, Bhuasiri, 2011) studied the subject within developing countries context while some other restricted the scope of their studies to a single country (e.g. Bathaeian, 2009). A few studies have focused on the Saudi context, which is the main concern of this research study. These studies and their results will be reviewed in more details in the next chapter.

The fourth and most obvious trend are the investigated perspectives. While the majority of authors (e.g. Selim, 2007a, Masroom, 2008; Mosakhani, 2010) have focused on a single perspective (e.g. students, academic staff/instructors, e-learning experts), some other researchers have focused on two perspectives (students vs. academic staff/tutors, academic staff vs. experts). As far as the researcher is aware, only one study (FitzPatrick, 2012) attempted to investigate three different perspectives (students, academic staff/instructors, e-learning experts) in one study.

This research project attempt to cover all these shortcomings. The researcher has carried an intensive literature review to check the available categorisation and potential factors in each category. These categories and factors will be presented in Chapter Five (Research Design). Moreover, this research is argued to be the first of its kind that investigates all possible categories of e-learning CSFs from all possible perspectives. That will allow a deeper understanding of the subject and the development of several comparisons which can help e-learning practitioners to focus their efforts and the available resources on the factors that matter the most for the success of the e-learning systems.

The results of the previous relevant studies will be presented based on the perspectives they have investigated. Thus, the first part will focus on the studies that studied students, academic staff/instructors, and e-learning experts' perspectives separately. Then the studies that investigated two perspectives will follow; and lastly the results of the studies that investigated all the three perspectives will be presented.

2.8.1 Students' Perspective

Two of the most cited studies in the literature are those conducted by Selim (2007a) and Selim (2007b). Both studies report the results of the same research which followed Exploratory Factor Analysis (Selim, 2007a) and Confirmatory Factor Analysis (Selim, 2007b). The study was conducted in United Arab Emirates University (UAEU) where 900 undergraduate students have participated. The study aimed at exploring students' perspective on e-learning CSFs. The initial list of CSFs was designed based on a literature review conducted by Selim (2007) and it included four initial categories of e-learning CSFs (instructor characteristics, student's characteristics, information technology, and university support). Subjecting the collecting data to EFA has resulted into a new categorisation which contained eight different categories (Instructor A, Instructor B, Student computing, Student collaboration, Student content, Technology A, Technology B, and Support). Each of these categories has grouped a set of a related factors. In terms of importance or criticality, the results of Selim (2007a) and Selim (2007b) have shown that students have considered instructors characteristics as most important category of CSFs while instructors have considered students as the least important category.

Another study which focused on exploring students' perspective is the one conducted by Puri (2012) and it has followed a quantitative methodology to analyse the data collected from 214 undergraduate and postgraduate e-learning students of various professional courses at Amity University, Noida campus. EFA was also used by Puri (2012) and the results have shown that the initially factors collected from the literature have been divided into six categories (Pedagogical, Institutional Administrative Affairs, Technological, Evaluation, Resource support, and interface design). The total number of factors within these categories is 27. It was noticed that Puri (2012) refers to categories as factors while he refers to factors as variables. It was also noticed that the naming of the categories (factors) are different from the most common one. Pedagogical categories, according to Puri contains 7 factors that focus on educational aspects such as students' commitment, instructor facilitation of learning, speed of feedback, usage of multimedia tools, etc.) Institutional Administrative Affairs contains 5 factors which focus on the administrative part of running the e-learning system such providing the required training, training willingness to learn the new technology, the cost of implementing and running the system, etc.). The Technological category focused on the factors which concerns the hardware and software parts of the e-learning system. This includes internet speed, error tracking, reliability of the software and hardware resources, backup facilities, etc.). The Evaluation category covered the aspect of learning progression using the e-learning system such as online examination, efficiency of education, etc. The resource support focused on factors such as language support, IT support, availability of support, etc. Finally, Interface design focuses on the e-learning interface interactivity in certain ways. This category included two factors and they are being user friendly and the ability to return to unfinished tasks.

The analysis results show that the surveyed student have ranked the Pedagogical category as the most important while ranked the Interface design as the least important category. Within these categories, willingness to learn the new technology by staff was ranked as the most important factor in the Pedagogical category which makes it the most important factor among all factors considered by the study. Moreover, the ability to return to the unfinished tasks was ranked as the least important in the interface design category which makes it the least important among all factors considered in Puri (2012) study. If a match can be done, it can be noticed that a partial set of Selim (2007a) and Selim (2007b) can be matched with some of the factors included in Puri (2012) pedagogical category (e.g. the instructor as a facilitator). Moreover, it can be noticed that Selim's studies and the factors considered in them are tailored to match students' experiences with the e-learning system they are using; however, this is not the case with Puri's study as it was noticed that some of the considered factors could be beyond the understanding, speciality, and experience of individual students. For example, asking the students about the costs of implementing or running an e-learning business or asking them about the staff willingness to learn the new technologies are believed to be beyond the comprehension of the students.

Mosakhani and Jamporazmey (2010) have also attempted to identify the 'eLearners' (students) perception on the most important factor that affect their acceptance of the e-learning system. The authors based their initial list of factors based on a literature review which identified seven categories of factors (instructor characteristic (3 factors), student characteristic (4 factors), content quality (3 factors), information technology quality (6 factors), participants' interaction (2 factors), educational institutions support (3 factors), and knowledge management (1 factor)). In total, these categories contained 22 factors that the respondents were asked to rank based on importance. The results of their analysis have shown that instructor characteristics was ranked as most important. In particular, the instructor's attitude to e-learning was classed as most important factor of all. The least important category and factor was the application of knowledge management tools in the e-learning system. It can be noticed that Mosakhani and Jamporazmey (2010) have directed question to the students which could be beyond their comprehension or experience with the e-learning system such as the financial support a university give to its e-learning system and the degree of applying knowledge management tools. This could be an indication of the reasoning for ranking this category as least important. It was also noticed that within the educational institutions support category, the 'proper feedback' factor was repeated twice despite that the mean, standard deviation, and other statistical value for both versions of the repeated factors are different. This could be due to a typo but it was important to mention it as it can affect the overall analysis results.

Attempting on identify the students' perspective, Musa and Othman (2012) choose to focus on two categories of e-learning CSFs, namely 'students characteristics' and 'richness of information technology'. These two categories contained a total of 36 e-learning CSFs divided as 13 factors that designated to measure the richness and reliability of the information technology used in implementing the e-learning system and 23 factors that designated to evaluate student's characteristics. These factors were selected from a literature review the authors have conducted. One of the first observation that can be noticed on this study is that while the authors claim that the study focused on two categories only as mentioned above, the actual factors they have selected are similar to those in wider set of categories in other researchers' work. For example, 4 or 5 of the factors listed under Technology category have been listed under interface design, support, and instructor characteristics by other researchers (e.g. Selim, 2007a; Selim, 2007b; Puri, 2012). A similar observation can be made on the student's characteristics factors; thus, several factors that are listed under that category are actually listed under different categories by other researchers. For example, the factors that concern the sufficiency of course content and its relevance to the course itself; also, the clarity of the instructions provided on how to use e-learning components. While these two example are argued to be unsuitable to be listed as 'students' characteristics' as they are more relevant to the system itself, they are also believed to have been listed in different categories by other researchers. The point is that while Musa and Othman (2012) have claimed to focus on technology and students' characteristics, they actually covered many factors beyond these two categories which is in a way can make their results partially unsuitable to compare with as they measure different factors from student characteristics as identified in the research arena. The study used a quantitative research methodology and utilised a questionnaire to collect data from 450 undergraduate students from the Faculty of Computer Science and Information Systems (FSKSM) at the Universiti Teknologi Malaysia. EFA was also used to analyse the data. The analysis results showed that the work of Musa and Othman (2012) followed a very similar style in dividing students' characteristics categories into sub-categories (i.e. students computing (10 factors), students collaboration (5 factors), and students content (7 factors)).

The technology richness and reliability category was ranked as most important category. In term of exact factors within this category, the students ranked the internet browsing speed as the most critical success factor. The second most critical category is the 'student computing with learning' by participation as the most important factor within that category. In third place was the Student collaboration with 'instructor participation in discussion group' as most important factor. In the least important position is the 'student content' category with 'placing course material in e-learning website on timely manner' as most important factor in the category.

A final example of studying the student's perspective on e-learning CSFs is the work presented in Abdel-Gawad and Woollard (2015). The authors have used a mix research methods (questionnaires and focus groups) to gather the data from the respondents. Four focus groups and 65 students' questionnaires respondents have participated in the data gathering stage. Moreover, it is important to notice that the work of Abdel-Gawad and Woollard (2015) is that they conducted semi-structure interviews with 3 academic staff out of total 5 interviews they have held. The authors clearly state that the aim of their research is to "is to identify the learners' views regarding classless e-learning and lecturers' opinions regarding the design and implementation of the e-learning system". Despite that, the results the authors have reported were mainly based on the analysing the focus groups data. There is no indication in Abdel-Gawad and Woollard (2015) on how the questionnaires data were analysed or what exactly their results are. As for the reported results by Abdel-Gawad and Woollard (2015), the authors states that 'the nature of the curriculum' category has been ranked as most important category of e-learning CSFs. In particular, this category as explained by the focus groups members focus on the content of the curriculum and the ability to include it or adopt it in an e-learning environment. The nature of the curriculum is divided into theoretical and pragmatic contents. In the second position of importance is the 'instructors' characteristics' category which contained three factors and they are the instructor computer competency, his or her attitude toward e-learning and their support for the students when using the e-learning system. The student (learner) characteristics were ranked in in the third place. This category contained three factors and they are the student's computer competency, their level of English language, and their learning style. Finally, in the least important position is the technology category which contained two factors and they are the usability of the used IT and its affordability and infrastructure.

2.8.2 Instructors' Perspective

Reviewing the literature has revealed that very limited research was dedicated to study the instructors' perspective on e-learning CSFs. The work presented by Ahmed (2013) argues that the identification of the factor that have the higher impact on instructors' intention to use the e-learning system has been neglected in the research arena, especially in the developing countries. To fill this gap, Ahmed (2013) carried out a series of in depth interviews and distributed a self-administrated questionnaire on instructor from 6 Egyptian universities. The questionnaires and the interviews questions were based on a model the author has constructed which contains 3 categories (dimensions) which contained a total of 10 factors. The instructor category contained the instructor's 'experience with Internet' and his or her Experience with computers'. The system category contained 5 factors and they are 'perceived ease of use', 'perceived complexity', 'perceived compatibility', 'Perceived trail-ability', and perceived visibility. Finally, the organisational category which contained the 'university culture' and 'university size' factors.

Based on analysing both interviews and questionnaire data, Ahmed (2013) concluded that the most important factors which affect the instructor's intention to use an e-learning system are the university culture which had the highest effect on instructors' intention, followed by experience with Internet, perceived usefulness, university size and perceived complexity.

Menchaca and Bekele (2008) have relied on a literature review to understand the factors which affect the success of Online Learning Environment (OLE) (i.e. e-learning). The main focus of Menchaca and Bekele (2008) is to obtain the perspectives of students (learners) and academic staff (faculty members). The authors have carried a longitudinal literature review study to cover the shortage of a comprehensive studies that identify OLE CSFs.

82 studies published in major journal were investigated and the resulting factors were divided in five categories. These categories are (a) human factors which included ICT competency,

motivation, attitude, experience, learning view, knowledge view, technology view, view of technology, and role in learning factors. (b) Technology related factor and it included asynchronous tools, synchronous tools, multimedia, friendly, dependable, layout, alternative tools, and speed factors. (c) Course related factors and it included structure/organization, quality content, activities/projects, relevance, clear goals, clear expectations, motivating, challenging, flexible factors. (d) Leadership factors and it included technology/provision, staff training, staff development, help desk, ICT laboratories, support teaching staff, and other logistics factors. (e) Pedagogic factors which included collaborative, interactive, feedback oriented, problem-based, process oriented, learner centred, and face to face learning.

The authors then collected data using surveys and focus groups from a sample of these students and academic staff in 23 campuses of California State University (CSU). In total, they collected data from 72 master's degree students who were then asked to participate in focus group for follow up discussions. Six academic staff, trainers and administrators were also part of the data collection process. The results of analysing the data gave a new categorization which included some and new categories and factors that were not part of the original investigated categorization. According to the results, both students and staff members considered technology related factors as most important for the success of an OLE. In particular, a highly repeated factors in the respondents answers in the availability of multiple tools which allow the users (especially learners) to carry out different tasks. Moreover, technical proficiency by both students and staff was considered of high importance by the respondents. Asynchronous and synchronous communication tools were also highlighted as important by both students and staff members. The order of importance of these factors slightly differed between students and staff. While the two groups agree that the availability of multiple tools is the most important factor followed by technical proficiency as second most important factor, students considered asynchronous tools as third most important and synchronous as the least most important. On the other hand, staff considered synchronous tools as third most important and asynchronous as the least most important.

Pedagogic strategies category was the second in important according to its repetition in the respondents answers. Within that category situated learning which refers to the cooperation between learners and between learners and their instructors, face-to-face (f2f) learning, change, and faculty importance were considered as important for the success of an OLE. Face-to-face refer to partial provision of actual classes even for some introduction and initial meetings and change refer to motivating students to accept the change in the way learning is carried out and to be able to tolerate ambiguity when exists. The order of importance for these factors from the most to the least important is as follows. Students: situated learning, face-to-face, change, and faculty importance; teachers: situated learning, faculty importance, face-to-face, and change. The third important category that emerged after analyzing the data by Menchaca and Bekele (2008) was the programmatic issues and it included three factors and they are: overall experience which refers to the positive impression the respondents have about the systems; enrolment which refer to the importance of being able to enrol in an online course. Program difficulty refers to the difficulty of using the course tools (communications, working with groups, etc.). The students gave the overall experience the highest importance followed by enrolment as second most important factor in this category and program difficulty as the least important factor. On the other hand, teachers gave overall experience the highest importance followed by program difficulty as second most important; noticeably, teacher gave no importance for enrolment.

2.8.3 Instructors/Students Perspectives Compared

Another study that focused on investigating the perspectives of academic staff and students is the one conducted by Taha (2014). The research has carried her study in Bahraini high schools and used a quantitative research methodology. A survey was used to collect data from a sample of 180 academic staff and 360 students. As a starting point, Taha (2014) has surveyed the literature for e-learning CSFs and divided the outcomes into four categories similar to those used by Selim (2007a) and Selim (2007b). Thus, the four categories were students' characteristics, teacher's characteristics, role of technology, and content and design. Students' characteristics included student motivation, computer skills, and student attitudes towards e-learning factors. Teacher's characteristics category included teacher attitudes toward e-learning, pedagogy and teaching Style and teacher's control of technology factors. Technology related factors category included quality of technology and effectiveness of IT factors. And lastly, design and content category included the perceived ease of use of the system and quality of content factors. According to the analysis results, students' characteristics were considered as the most important category of factors. In particular, students' attitude towards the e-learning system was considered as the most influential factor among the investigated ones. This factor was followed by the students' motivation, and lastly the students' computer skills. Students also considered the teachers' characteristics as of a high importance to the success of the implementation and the usage of the e-learning system.

Another finding that Taha (2014) discusses is the role of communication between the involved parties and it importance in the success of the e-learning system. Moreover, the students suggested that the teacher's skills and their characteristics play a vital role in the success of e-learning systems. In Particular, the students emphasised on the teachers' attitude while educating the students using the e-learning system and their mastery of the techniques and tools offered and used in an e-learning-based environment. Their enthusiasm during the teaching process motivates the students to be more engaged and involved in learning using the technology offered by the e-learning system.

It was noticed that Taha (2014) focused more on comparing the perspectives of different demographic groups within the students and the teachers' samples. For example, she described in great details the differences between male and female students and teachers regarding a certain point of the e-learning system. What Taha (2014) has slightly missed is the importance of contrasting the two main perspectives in her research and their detailed opinions about the factors that motivates the success and failure of an e-learning system. Figure 2.3 shows the final model proposed by Taha (2014) for e-learning system success.

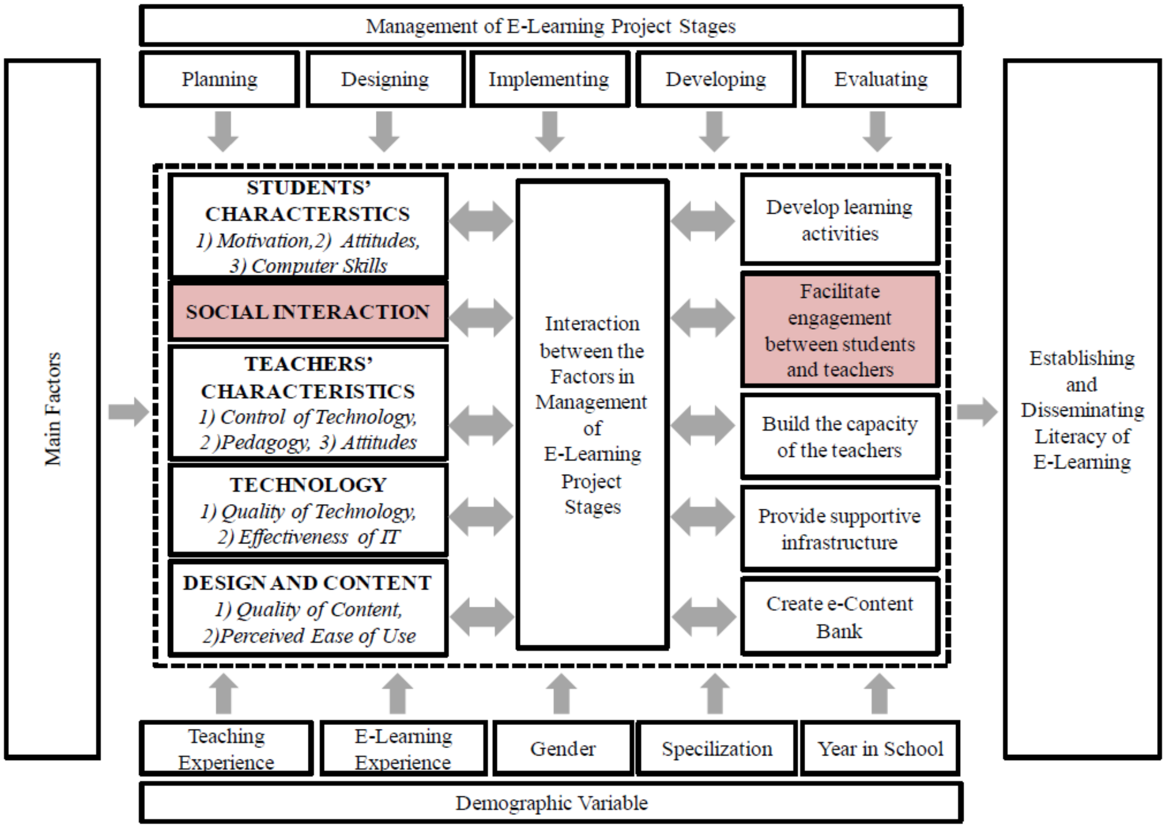

Figure 2.3: e-learning success framework (Taha, 2014)

Based on previous studies on the topic, Bhuasiri et al (2012) has developed an initial model which contained seven different categories of e-learning CSFs in developing countries. These categories are "learners' characteristics, instructors' characteristics, e-learning environment, institution and service quality, infrastructure and system quality, course and information quality, and motivation". Each of these categories was filled with relevant e-learning CSFs based on previous studies in the literature. The model was then used as the bases for constructing a questionnaire that was used to investigate the perspectives of ICT experts and academic on the importance of certain e-learning CSFs over other factors. Bhuasiri et al. (2012) then used AHP software to calculate the weight of each factor in the collected data from a sample of 82 experts in e-learning and e-learning academics. Based on the results, there was a between experts and academic on which are the most important categories and factors within these categories. The order of importance for ICT experts was learners' characteristics, Instructors' characteristics, Institution and Service Quality, Infrastructure and System Quality, Course and Information Quality and the least important was Extrinsic Motivation. On the other hand, teachers ordered the same categories based on their importance as infrastructure and System Quality, Learners' characteristics, Instructors' characteristics, Course and Information Quality, Extrinsic Motivation, and Institution and Service Quality.

Within the categories themselves, the views between ICT experts and teachers have also differed on the level of importance of different factors. For example, within learner's characteristics, ICT experts have considered students attitude toward e-learning is the most important while student's internet self-efficacy as the least important. In contrast, teachers have considered student's computer self-efficacy as the most important and attitude toward learning as the least important. In the instructor's characteristics, differences have also showed. ICT expert gave the timely response factor the highest important while giving interaction fairness as the lowest importance. In their turn, teachers made attitude toward students as the most important factor while placing focus on interaction in the lowest position of importance. A noticeable difference in the instructor's characteristics category ranking is that teachers gave no importance for internet fairness when ICT expert gave her the lowest importance. Yet another noticeable observation is that both ICT experts and teacher have given an identical ranking for all factors in the Course and Information Quality and Extrinsic Motivation categories. Thus, both groups have ranked course quality as the most important factor in the Course and Information Quality category while ranking Course Flexibility as the least important factor in the same category. In the extrinsic motivation category, Perceived Usefulness was ranked as more important than Clear Direction factors. The last category included only these two factors.

Bhuasiri et al (2012) conclude with a statement that specify the most important five factors from all categories that should be carefully considered when designing and implementing an e-learning system. According to Bhuasiri et al (2012), "computer training, perceived usefulness, attitude toward e-learning, computer self-efficacy, and program flexibility are the top five influential factors that impact e-learning success in developing countries from an ICT expert's perspective. Perceived usefulness, attitude toward e-learning, program flexibility, clear direction, and course quality are the top five essential factors that influence e-learning success in developing countries from a faculty perspective".

2.8.4 Students/Instructors/Experts Perspective Compared

Another contribution in the literature which has explored different perspectives of some of the parties in the e-learning environment is the work presented by FitzPatrick (2012). In this study, an initial model for e-learning CSFs was built which categorized these factors into 5 categories including 30 different factors. The initial categories were technology, human, design, support, and evaluation although it is not explained how the 30 factors are divided between the five categories. Mixed research methods was used to explore the perspectives of different groups and parties involved with the e-learning system regarding these categories and factors. First, in depth interviews were conducted with four types of experts in the field of e-learning. e-learning policy makers, education policy makers, e-learning instructors and teachers. This was followed with a questionnaire distributed to 394 students, 45 teachers, and 22. To analyse the data thematic analysis was conducted on the data collected in the interviews and SPSS was employed to analyse the quantitative data collected using the questionnaires. The results of analysing the data were presented per group and for all the respondents (mainly based on the questionnaire responses). According to the results, the mean of all respondents' shows that the order of the five categories give technology the highest level of importance; this is followed by the system design as second most important category. In 3rd, 4th, and least important category are human, support, and evaluation categories respectively. These rankings differ among the respondents groups. Students ordered these categories from the most to the least important as follow: technology, design, evaluation, human, and support. For teachers it was human, support, design, technology, and evaluation. Experts ordered them as human, technology, support, human, and evaluation. In terms of actual factors, FitzPatrick (2012) selected the most important 3 factors in each category. In the technology category, the results show that availability, connectivity, and reliability are the most important factors based on all respondents' average. In the human category, the most important three factors are pedagogy, attitude, and communication; thirdly, in the design category the results show that content, interface, and framework are the most important factors. Fourthly in support category, feedback, resources, and training factors; and finally, in the evaluation category assessment, usability, and quality factors are the most important. Figure 2.4 summarises FitzPatrick's (2012) work

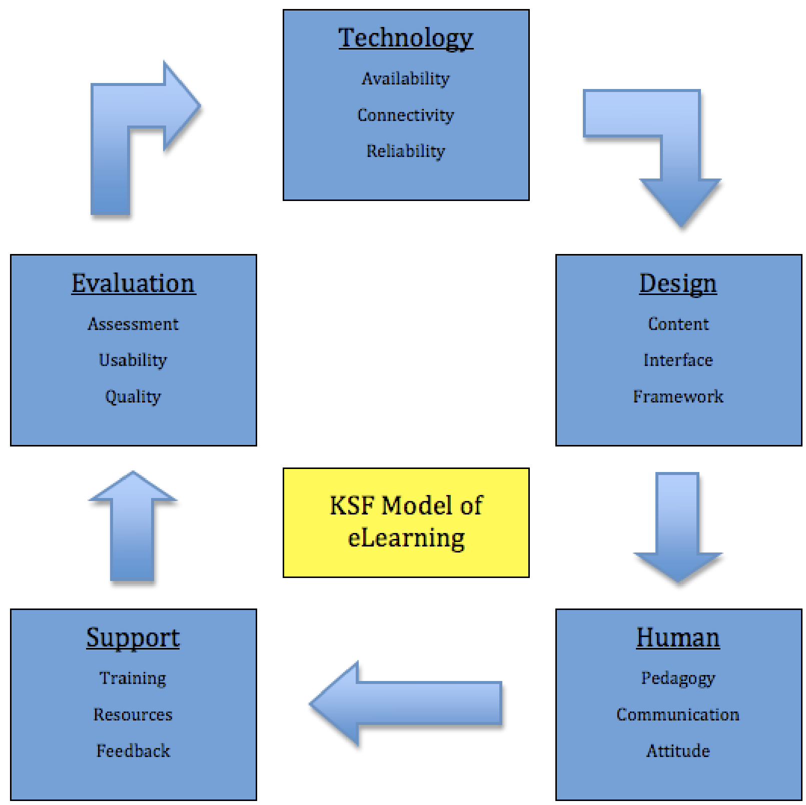

Figure 2.4: Key Success Factors of e-learning model (FitzPatrick, 2012)

As it can be noticed from these examples of related research works, the differences between researchers in the e-learning arena occur on different levels. For example, the perspective they investigate, the number of categories and factors they consider and the results they conclude with. It was shown, the majority of the research work presented in the literature have focused on a singular point of view or two points of view at the most. Apart from FitzPatrick's work, nearly none of other researcher has developed a comprehensive study where all the involved parties in an e-learning system have been investigated. This is especially true in a Saudi context where the research on this subject is even more limited than on a global level. The next chapter will present similar subjects to those introduced in this chapter, however, the main focus will be on the Saudi context where the available research works will be discussed and the gap that this research project covers will be made even clearer.

2.9 Research into e-learning Critical Success Factors in KSA

Reviewing the literature has shown very limited focus of studying e-learning CSFs in a Saudi context. The researcher has found a few studies that explicitly state that they are aiming to investigate e-learning CSFs in some Saudi context.

The most comprehensive study was conducted by Fryan and Stergioulas (2012) and aimed at identifying e-learning CSFs in Kingdom of Saudi Arabia. To do so, the researchers have used a triangulation of primary and secondary data collection processes. Literature was the main source for secondary data and it was surveyed for any e-learning success factors. This process resulted in 39 CSFs, according to the authors. The authors then conducted a series of interviews and questionnaires in 5 different Saudi universities and training centres in order to validate the outcomes of their literature review of e-learning CSFs and to be able to order these CSFs according to their importance. According to Fryan and Stergioulas (2012), a general mutuality was found between the results of the literature review and the primary data collection results (Interviews and questionnaires); nevertheless, the interviews and questionnaires have identified 7 additional e-learning CSFs to those found in the literature. However these additionally found factors were not accredited to any specific reason. In total, the authors have identified 52 different e-learning CSFs that are relevant to the Saudi context.

It is important to notice that despite the claim the authors made that their research aims at identifying the importance of e-learning CSFs, they did not specify how exactly they did that or showed that in the results.

Another important study which focused of investigating and identifying e-learning CSFs in Saudi Arabia is the one conducted by Al-Tameem (2005). The author has focused on one class of e-learning CSFs which is the technical (engineering) CSFs. The study has followed a similar approach to that of Fryan and Stergioulas (2012). The relevant e-learning CSFs factors have been identified in the literature then a qualitative approach of research was used to get an in-depth insight about their validity and importance in several cases studies in Saudi Arabia. It is not clear exactly what these case studies were or how they were selected. The outcome of the study has identified three classes of technical issues which can largely affect the e-learning systems implementation in Saudi Arabia. These issues are: (1) reliability in the ICT infra-structure. This refers to the availability of the technological infra-structure that allows the implementation of the e-learning system and then the delivery of the learning material; (2) System security: which refers to the *"capability of the online organisation's website to protect user information from potential threats"* (Al-Tameem, 2005). In an e-learning system's environment, this issue refers to the protection of the learning material and the users' private data. The level of the users' trust and confidence that their belongings are protected can affect their intentions whether to use the e-learning system or not; (3) Access (on-site and off-site): This refers to the availability of internet access that the users can utilise to access the e-learning system. The author states that there is a major issue when it comes to the availability of such access in Saudi Arabia. Overpriced and low bandwidth limits are some of the technical issues that challenge the successful implementation of e-learning system in Saudi Arabia, according to the author.

Another study that was found in the literature which focused on identifying e-learning system CSFs is the one conducted by Al-Homod and Al-Shafi (2012) is similar to that of Al-Tameem (2005) in the sense that it has focused on studying the technical class of e-learning CSFS. The study which was conducted King Saud University, has also reviewed the literature to identify the relevant CSFs. The literature review has resulted in 11 different CSFs. These CSFs were then subjected to a validation process through primary data collection which aimed to identity the relevance of literature review-based identified CSFs to the Saudi context and the importance order of them. These CSFs are shown in the table2.4. from Al-Homod and Al-Shafi (2012).

Success factors
Sufficient Users Training
Organization Commitment

Management Support
Technical Support
Positive attitude of users
Easy To Use tools
Sufficient Training to Engineers
Sufficient e-learningin itiatives
Sufficient Man power
Availability of Info on e-learning Website
Support from other Departments

Table 2.5: e-learning technical CSFs (Al-Homod and Al-Shafi, 2012)

The factors are ordered in the table based on their importance from the users' perspective. According to Al-Homod and Al-Shafi (2012), the first 4 factors are highly important while the following 6 are important but they are not critical. The last factor is the least important factor in the identified 11.

The latest and final research work reviewed here was presented by Naveed et al. (2017) which in similar fashion to the studies reviewed above has relied on surveying the literature to identify e-learning CSFs. Based on their literature review, e-learning CSFs were divided into 5 dimension namely student, instructor, design and content, system and technological, and institutional management dimensions. These dimension contained a total of 36 factors which were subjected to validation by a sample of 256 respondents who were a mix of students, instructors, and e-learning staff. The researchers have used a questionnaire for that purpose and it focused on identifying the importance of these 36 factors according to the respondents' perspectives. Using EFA, the authors have analysed the data they have collected from the respondents. Their analysis shows that within the student's dimension which contained seven factors (attitude towards e-learning, student' motivation, computer competency, computer anxiety, interaction with other students, commitment towards online studies, and general internet self-efficacy), student's motivation is the most important for e-learning implementation while the least important factor is the interaction with other students. In the instructor dimension which contained another seven factors (instructor's attitude towards e-learning, instructor's ICT skills, instructor's cultural awareness, easy language communication, interaction with students, appropriate timely feedback, and self-efficacy), appropriate timely feedback has gained the highest ranks of importance among the respondents. Instructor's cultural awareness, on the other hand, was placed in the position of the least important factors when it comes to e-learning system implementation. Under the design and content dimension, eight factors were listed (interactive learning activity, appropriate course design, use of multimedia instructions, user friendly organised, course flexibility, understandable contents, stuffiest updated content, and perceived ease of use). According to Naveed et al. (2017), user friendly organised factor was placed as the most significant while course flexibility is the least significant factor that influence an e-learning system according to the respondents. Fourthly, the system and technological dimension contained another seven factors and they are appropriate system, ease of access, technical support for users, good internet speed, efficient technology infra-structure, ease of use, reliability, and network security. Among these factors, good internet speed was voted as the most important while network security was voted as the least important factor. Finally, in the institutional management dimension, six factors were considered and they are infrastructure readiness, financial readiness, and training for users, support for faculty, ethical and legal issues, and proper feedback. Training for users was ranked as the highest important factor while ethical and legal issues factor was ranked as the least important one.

Based on the average mean of the different factor within a certain category, Naveed et al. (2017) recommends that system and technological dimension is the most important category of the five considered ones while student dimension is the lowest important category.

Naveed's (2017) work is very relevant to the work being conducted in this research project. Nevertheless, it is believed that their work has suffered a few issues which should be mentioned. First, in the abstract the authors stated that the sample was of 257 respondents and that this was a mix of students, instructors, and e-learning staff. However, in the research methods section, the number had decreased to 247 and they were called e-learning professionals without specifying the nature of their involvement with e-learning systems in their institutions. Another issue is that the author claims that they collected data concerning the demographics of the respondents, however, they didn't show how different groups of the sample (students, instructors, and e-learning staff) have responded to the questions differently. A final issue with the work of Naveed et al. (2017) is that the content of the questionnaire (factors considered) could be unsuitable to be evaluated by some members of the sample (assuming that the sample contained different types of respondents). For example, the students will have very little experience with the ethical and legal issues.

The research work that have been presented so far show how limited e-learning CSFs identification research in a Saudi context is. Despite that the vast majority of Saudi universities adopting, fully or partially, some e-learning technologies, the amount of invested resources to research this topic are very limited. This research project attempts to fill this gap through researching this topic from all potential viewpoints and a comparison between these viewpoints will be presented. This will help the involved parties in the planning and implementation to decide which areas of the system they should focus and invest most resources on. Given the allowed resources for this research (i.e. personnel and time), the impact of demographic characteristics of the respondents on the identification of e-learning CSFs might be postponed to a later stage (e.g. future research).

2.10 Summary and Conclusion

Over the past two decades, the adoption of e-learning in the education field has been accelerating. Governments and educational institutions invest huge resources in planning and implementing these processes. However, due to several obstacles and challenges, some of these projects face failures. The research arena has provisioned several approaches to evaluate e-learning process implementation and adoption. This project adopts one of these approaches namely, Critical Success Factors (CSFs) identification which focuses on identifying the factors and areas which are considered important by the parties involved in the using and implementing e-learning systems. The topic of e-learning CSFs identification has been widely discussed in the literature. Differences among researchers emerge in how they define e-learning itself, to the ways and approaches they handle and identify its CSFs. The purpose of this chapter was to develop a thorough background on these issues. The chapter attempted to cover as many concepts as possible and discussed the differences in the research arena about some of them. The material presented in this chapter will form the basis for the following chapters. The results of previous studies presented in section 2.9 will be used to compare with this research project results. Also, in several parts of this chapter, some gaps and issues with the current academic research in the e-learning CSFs field were highlighted; one of the aims of this research project is to fill these gaps. In particular, the research project will aim to develop a comprehensive study that investigates the point of views of students, experts, and academic staff in a Saudi context which does not exist so far as it will be discussed in greater details in the next chapter.

CHAPTER THREE: SAUDI CONTEXT

3.1 Introduction

The previous chapter has laid down the background knowledge required about e-learning, its history, definition, benefits and challenges. The implementation of e-learning system has varied in speed and shape in different context. For example, in developing countries, the speed of such implementation could be slower that in developed counties. Moreover, local cultures, resources, and education systems could influence that implementation. This chapter attempts to focus on the context where this research project is taking place, namely Kingdom of Saudi Arabia. The chapter allows the reader to have a better understanding of the country, its history, culture, economics, education system and a special attention is paid towards the integration of information technology in the education system. As part of that integration process, the adoption and implementation of e-learning system is central. Therefore, current trends in those adoption and implementation of e-learning system in Saudi academic institution also receive good attention in this chapter. To achieve its aims, this chapter is organised as follows. Section 3.1 provide an overview of the formalization of Kingdom of Saudi Arabia, it economy, local laws and culture. Section 3.3 focuses on the educational system in the country. Section 3.4 present the history of integration Information and Communication Technology (ICT) in the Kingdom while section 3.5 complement 3.4 by focusing on the integration of ICT in the Saudi educational system. E-learning in the Saudi context is presented in section 3.6 followed by section 3.7. which focuses on the academic institutions and how they implement their e-learning systems.

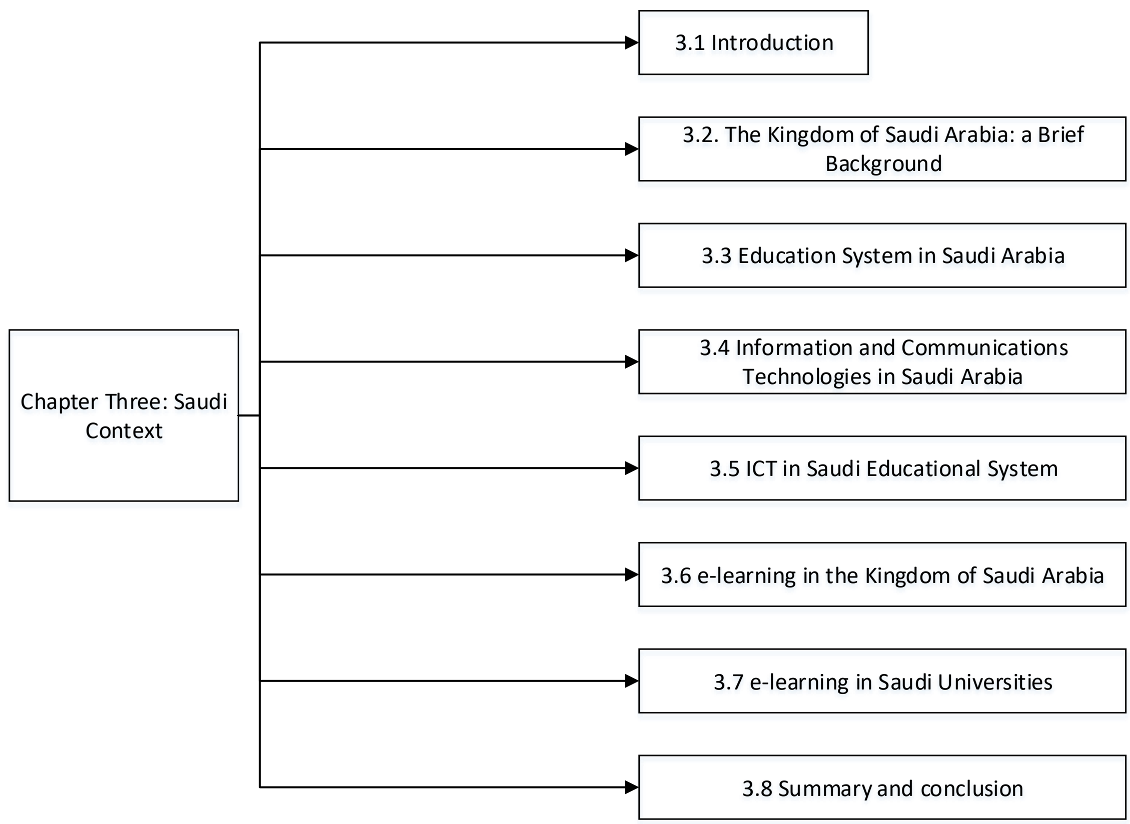

Figure 3.1: Chapter Sections

3.2 The Kingdom of Saudi Arabia: a Brief Background

In 1932, King Abdul-Aziz Bin Saud, who is also known as the Founding King, has found the Kingdom of Saudi Arabia. The Kingdom occupies nearly 80% of the Arab Peninsula and bordered by Iraq, Jordan, and Kuwait to the north, United Arab Emirates, Qatar and Bahrain to the east, the sultanate of Oman and Yemen to the south, and the Red Sea to the west (Al-Othaimeen, 2005). Figure 3.2 shows the map of the Kingdom of Saudi Arabia.

Figure 3.2: map of Saudi Arabia (Al-Othaimeen, 2005)

The country is divided administratively into 13 provinces and they are: (Makkah, Almadinah, Arriyadh, Albaha, Jazan, Asir, Najran, Asharqiyah, Alqassim, Alhodod Ashamaliyah, Hail, Tabukand Aljouf) (Abualieah, 2003).The following figure (3.3) shows the locations of the provinces on the Saudi map.

Figure 3.3: The 13 provinces in Saudi Arabia (Abualieah, 2003)

Arabic is the official language in Saudi Arabia and Islam is the official religion. Saudi Arabia has several features that give it uniqueness from all other Muslim countries which is that Islam has originated in Makkah. Furthermore, two of three most holy places in the Muslim world are located in Makkah and Al-Madinah which gives it more importance among Muslim countries. All Muslims are obliged to travel to Makkah, at least once in their life time, for pilgrimage. Since its founding, Saudi Arabia has been ruled according to the teaching of Islam and Sharia laws. All the concepts of living of Saudi citizens have to adhere to these rules. This of course doesn't mean that modernisation is not taking part in the Saudi society (Ministry of Communications and Information Technology (MOCIT), 2008).

Demographically, the Saudi population is growing fast. According to the latest statistics, the population in Saudi Arabia has reached 27,345,986 by June 2014 (CIA Factbook, 2015). The Saudi population is a young one with nearly 47% of the population is 24 years old or younger. Furthermore, males form about 55.3% of that population. It is important to notice that due to the economical surge in Saudi Arabia due to the discovery of Oil, nearly 30% of the Saudi population are immigrants who moved to Saudi Arabia for economic reasons. This might explain the higher ratio of males in comparison to the females' ratio as most of these immigrants are males who carry out physical labour jobs, especially from Asia (ESCWA, 2015).

The discovery of Oil in 1938 has dramatically changed nearly everything about the Kingdom of Saudi Arabia. From being a backward country, which relied on primitive farming and trade as main source of the national income, Saudi Arabia became one of the richest countries in the World. This hasn't only enhanced the personal income of its citizens but also has helped the governments to launch a national development program that aimed at modernising the Kingdom. This included creating the first national health system, urbanising most of the Kingdom, and creating a nationwide education programme. Nowadays, Oil is the main source of income for Saudi Arabia which has given her a strong international position that helps her to be a major influential player in the international community, especially when it concerns the political and economical issues in the Middle East. There are a few other minor sources for Saudi Arabia income such as gold, silver, copper, zinc, lead, iron, aluminium, phosphate and coal (Ministry of Communications and Information Technology (MOCIT), 2008). Moreover, many of the manufacturing industries in Saudi Arabia rely on services related to the oil industry, however, there are many other industries which are not and focus on services, food, and farming. As mentioned earlier, the oil discovery has made Saudi Arabia an attractive destination for many skilled and unskilled people from all over the world to travel to for the purpose of work. 30% of the Saudi population are foreign workers. This gives the Saudi society a sense of multiculturalism. The education sector in Saudi Arabia is one of the fastest growing sectors in Saudi Arabia. Next section elaborates on this and focuses on higher education sector in the Kingdom.

3.3 Education System in Saudi Arabia

When King Abdul-Aziz Bin Saud founded the Kingdom, only five schools existed in the whole of Kingdom. The actual start of the Saudi education system can be back dated to 1925 when a royal directorate of public education was announced (Ministry of Education, 2008). The first Saudi education policy was established by the Shura Council (councillors' council) in 1929 which laid down the basic guidelines and components for the Saudi educational system. This policy was advanced by the announcement of another education policy by the same council in 1970. According to the Saudi educational system, there are three stages of education; primary, intermediate and secondary schooling. The total number of years a student spends in obligatory schooling is 12 years (Ministry of Education, 2008). The development of the Saudi education system is a continuous process. For example, in 2008, a new project named after the late King Abdullah (King Abdullah Public Education Development Project) was announced with nine billion Saudi Riyals (i.e. 1.51 British pounds) dedicated to it. The main aim of this project is to provide free public education for all Saudi citizens in all regions of the Kingdom (Ministry of Education, 2008).

A special focus of the policy makers in Saudi Arabia is to improve higher education in the Kingdom. For that purpose, a special ministry (Ministry of Higher Education) was established in 1975 to oversee and supervise all the issues and policies that help improving this sector (Ministry of Education, 2008). The first higher education institution in Saudi Arabia is King Saud University which was established in 1957. Since then, tens of different higher educational institutions were established, by both the public and private sectors. Table 2.1 shows just one type (universities) of these higher education institutions. It is important to notice that there are more than 200 higher education institutions (e.g. colleges) which can not be listed to avoid any cluttering.

University	**Foundation**	**City**	**Public/Private**

King Saud University	1957	Riyadh	public
Imam Muhammad bin Saud Islamic University	1974	Riyadh	public
Saudi Electronic University	2011	Riyadh	public
Arab Open University	2002	Riyadh	public
Prince Sultan University	1999	Riyadh	private
Dar Al Uloom University	2005	Riyadh	private
Alfaisal University	2007	Riyadh	private
Princess Nora bint Abdul Rahman University	1970	Riyadh	public
King Saud bin Abdul-Aziz University for Health Sciences	2005	Riyadh	public
Al Yamamah University	2004	Riyadh	private
Shaqra University	2010	Shagra	public
Al Majma'ah University	2010	AlMajma'ah	public
King Abdullah University of Science and Technology	2009	Thuwal	public
King Abdulaziz University	1967	Jeddah	public
Effat University	1999	Jeddah	private
Arab Open University	2006	Jeddah	private
Umm Al-Qura University	1979	Mecca	public
Taif University	2004	Taif	public
University of Dammam	1975	Dammam	public
King Faisal University	1975	Al Ahsa	public
King Fahd University for Petroleum and Minerals	1963	Dhahran	public
University College of Jubail	2006	Jubail	public
Arab Open University	2006	Dammam	private
Prince Mohammad University	2006	Khobar	private
Salman bin Abdulaziz University	2010	Al-Kharj	public
Islamic University of Medina	1961	Medina	public
Taibah University	2005	Medina	public
King Khalid University	1998	Abha	public
Qassim University	2004	Al-Qassim	public
Sulaiman Al Rajhi University	2009	Bakireya	private
Al Jawf University	2005	Sakakah	public
Jazan University	2005	Jizan	public
University of Hail	2006	Ha'il	public
Al Baha University	2006	Al-Baha	public
Najran University	2006	Najran	public
Northern Borders University	2007	Arar	public
Tabuk University	2006	Tabuk	public
Fahd bin Sultan University	2003	Tabuk	private
University of Business and Technology	2012	Makkah	Private

Table 3.1 Universities in Saudi Arabia

As table 3.1 shows, the last 15 years have witnessed a revolution in number of newly established universities; this especially accurate for privately funded universities. These private universities are usually dedicated for non-Saudi students who reside in the Kingdom and not allowed to enrol in the public ones which are dedicated for Saudi citizens only. Such huge increase in the number of universities in Saudi Arabia is believed to reflect both the public and the government belief of the importance of higher education and the increasing growth in the Saudi industrial and economical needs for Saudi skilled people. According to the recent statistics, 1,356,602 is the number of Saudi males and females are enrolled in different higher education programmes in both private and public universities (Ministry of Education, 2015). The Saudi universities offer a wide range of Academic degrees in all different subjects. Following the Islamic rules, all Saudi education institutions (both schools and higher education institutions) segregate between male and female students. This also applies on teaching and administrative staff in most cases (Ministry of Education, 2008). Moreover, the Saudi government also has a special programme which is dedicated to fund Saudi citizens who wish to study abroad. Up to 2009, the programme was responsible for funding the studies of over 70,000 Saudi students who are dispersed around the world. The main aim of the programme is to transfer the educational experience and knowledge from the credited universities around the world to the Saudi society through these students (Ministry of Higher Education, 2009).

The importance of the inclusion of Information and Communication Technology (ICT) has been widely emphasised in most of the policies and literature concerning all education in general and higher education in particular in Saudi Arabia. Next section focuses on the development of ICT infra-structure and policies in Saudi Arabia with special emphasis on ICT in higher education sector.

3.4 Information and Communications Technologies in Saudi Arabia

Over the past two decades and along the global revolution in ICT, Saudi Arabia has invested and grew as one of the fastest markets in the region and maybe in the world for different ICT artefacts. According to Mobily (2015), the investment in ICT services in the Saudi market is estimated to grow to SAR123 billion (i.e. $33 billion). This makes the ICT sector as the second biggest Saudi national income source after Oil.

The current revolution in Saudi ICT on such wide level can be back dated to 1992 when the medical and research institutions were permitted to connect to the internet for the purposes of academic research. Since then, the boom continued. The current estimation of Internet penetration in Saudi Arabia is 59.2% of the Saudi population; thus, more than 17 million internet users. This makes Saudi Arabia as one of the fastest growing Internet market in the world. Furthermore, in 2015, number of mobile phones lines in Saudi Arabia has reached 51 million. That is double the actual population.

The government has largely contributed to the growth of an information society (Ministry of Communications and Information Technology, 2009). The establishment of the City of Information and Communications Technology in Riyadh is one of many governmental initiatives to help supporting and regulating the ICT industry in the Kingdom. The City of Information and Communications Technology does not only regulate the industry but also financially support the growing ICT businesses in the Kingdom. One of the most important projects which the City has initiated and is believed to be the most influential project on the growth of the Saudi ICT sector is the National Plan for Information and Communications Technology in 2006. This plan had the following aims (Ministry of Communications and Information Technology, 2009):

a. Optimising the use the ICT artefacts to help raising the rates of productivity, effectiveness and efficiency of the all other sectors.
b. Disseminating the governmental information and services including health care and other governmental services (e-Government) through the use of ICT.
c. Creating fairer policies and regulations that help finding the balance between attracting investors to the ICT sector while maintaining reasonable and affordable prices of ICTs for the end users.
d. Support the innovation in the ICT sector through encouraging the efforts of the scholars and researchers both nationally and internationally.
e. Support the establishment of a robust Saudi ICT sector that can compete in regional and international markets and generate additional income for the Kingdom.

f. Incorporate technology as an essential part of the educational system in Saudi Arabia in all level to help optimising this sector.

Once the plan has been published, all the responsible parties in health, education, business, and all other sectors started to take action toward implementing the plan's aims. As it can be noticed, the plan has emphasised the personal development and the usage of ICT artefact in educational institutions. The following section elaborates on using ICT in the Saudi educational system.

3.5 ICT in Saudi Educational System

Although computers were introduced in the Saudi secondary schools' curriculum as early as 1985, it is believed that the actual penetration of ICT in the educational system is still immature. Recently, there have been more emphases on integrating ICT as part of the educational process at all levels of the Saudi educational systems. This is clear from the last aim of the Saudi national ICT plans described above. Over the past decade, there were several projects from the government that motivated the integration of ICT as part of educational system. For example, in 2003, the Ministry re-pushed towards integrating obligatory weekly 4 hours of ICT teaching in every secondary school in the Kingdom. In terms of the resources provision, in 2009, the ministry of education started a new initiative to provide a computer laboratory in every school in the Kingdom. This is believed, by the ministry, to give the students a chance to experiment with computers rather than have theoretical knowledge about them. Providing electronic materials (e.g. books) was yet another project conducted by the Saudi Ministry of Education which started the Learning Resources Centres (LRCs) project. The LRCs project aims to integrate electronic materials as part of the schools' libraries.

Digital Technical Centres (DTCs) are yet another new project. They have been established in various educational regions of Saudi Arabia with the aim of meeting educational needs in the areas of digital content and the educational application of ICT. Each of these centres is equipped with a unit for the production of digital interactive educational aids to support school curricula (Al-Shmrany, 2012; Oyaid, 2009).

One of the biggest government projects which focused on the integration of ICT in the Saudi educational system is the National Project (Watani) which was launched in 2003. The project, according to the ministry of education, has six aims and they are (Al-Shmrany, 2012):

a. To develop students' skills by exploiting and using information technology (IT) in education, and thereby prepare students in an effective way for the future.
b. To improve teachers' potential by employing information technology in all educational activities.
c. To provide an information-rich environment, with scientific content and direct educational sources for students and teachers.
d. To improve the outcome of the educational process by pursuing outstanding future generations of graduate students who have mastered the use of information technology.
e. To partake in the creation of a nucleus for an advanced information technology industry in the Kingdom.
f. To promote comprehensive awareness of the benefits of employing information technology in education and disseminating knowledge about information technology throughout the society at large.

To summarise, the Saudi government is clearly aware of the importance of knowing how to use ICT in the future of generations. This awareness has been reflected through several projects funded by the government to enhance the Saudi students' technological skills. The concept of e-learning has also attracted the Saudi government and researchers (Oyaid, 2009). Next section elaborates on the development of e-learning is the Kingdom of Saudi Arabia.

3.6 e-learning in the Kingdom of Saudi Arabia

Although ICT has been adopted in the Saudi educational system very early as it was presented in the previous section, Al-Balawi (2007) states that Saudi Arabia was slightly late in terms of adopting e-learning as means of engaging students who physically unavailable in the educational institute geographical location. He (Al-Balawi), dates that to the second half of the current century. Furthermore, the establishment of the National Centre of E-learning and Distance Learning in 2005 by the Ministry of Higher Education is Saudi Arabia was the official announcement of the shift toward adopting e-learning as part of the Saudi educational system. The centre aims at encouraging Saudi universities and helps them in their efforts to adopt and implement their e-learning system. It also helps in digitalising the hard material (books, curriculums, etc.) (Al-Dosari, 2011).

In addition to the general aim of encouraging the adoption of e-learning in the Kingdom, the National Centre for E-learning and Distance Learning has many other objectives and projects which have been developed over the past several years. Among the repeatedly emphasised objectives of the centre is to transfer the international knowledge and experiences in developing and implementing e-learning systems to the Saudi educational system to aid the responsible parties in avoiding any fatal mistakes committed by other universities around the globe. The Centre's management aims to expand its scope to beyond the Saudi borders by making the suitable e-learning materials and technology available for non-Saudi learners as well as Saudis (Abaalhassan, 2007). The National Centre for E-learning and Distance Learning is believed to be one of the leading examples of similar centres in the Middle East and Arab World.

In terms of the project the centre either developed or developing, the Jusur (bridges) project comes as one of the earliest projects the centre has executed. Jusur is a Learning Management System (LMS) that is used by many governmentally funded universities (public). According to Jusur project website (http://jusur.elc.edu.sa/jusur/), the main objective of Jusur is to allow the universities to register new students, follow their academic progress, and prepare suitable reports about them. This is done in a central fashion; i.e. the experiences are shared between different universities. Furthermore, university exams can also be prepared and conducted through the system.

The Learning Portal in another project that is executed by the National Centre for E-learning and Distance Learning. This project makes online learning materials available for students remotely. It also provides the teacher with teaching skills enhancement tools and learning materials.

A final example of the National Centre for E-learning and Distance Learning projects is the e-learning Award for excellence which is an award that is given to rewarded for the over achieving and creative individuals and institutes in the field of e-learning in an annual ceremony held by the Ministry of Higher Education (National Centre for E-learning and Distance Learning, 2015).

In terms of getting the educational institutions involved, and despite the slow start, according to the National Centre of E-learning and Distance Learning website, it has formed partnerships with about 42 educational institutions so far. The majority of these institutions are universities while the remaining minority are collages and higher education institutions (National Centre of E-learning and Distance Learning, 2015). In addition to the establishment of the National Centre for E-learning and Distance Learning, just like with other initiatives made by the government to encourage education, in 2007, the Saudi government has allocated $125m for the development and integration of e-learning Artefacts which include infra-structure and systems adoption and customisation in Saudi educational institutions.

3.7 e-learning in Saudi Universities

The concept of e-learning has been widely discussed in the research arena over the past decade. These discussions were mainly motivated and increased by the dramatic development and the wide use of Information and Communications Technologies (ICT). This brief survey is in a progress work and it attempts to present the understanding of e-learning in Saudi universities. The original aim of this survey was to identify the definition of e-learning as it is presented on the websites of the Saudi universities; nonetheless, after an initial review of these websites, it was found that they do not offer e-learning definitions per se but there are special deanships for e-learning in some of these universities which are dedicated supervise the development and maintenance of e-learning systems in these universities. Furthermore, it found that there is a special centre called "the national centre for e-learning and distance learning" which coordinates the efforts in the Kingdom of Saudi Arabia towards improving the young experiences in the universities and other concerned institutes in the two fields. According to the centre website, there are 16 partner institutions and they include 11 universities, 3 military institutions, a religious studies collage, and the national human resources development centre. Thus, from 24 governmental, 8 private universities, and 494 collages in 76 counties and cities, only 12 have formed a partnership with the national centre for e-learning and distance learning. As mentioned earlier, it was found that in each of these universities and collage, there is a deanship for e-learning which seems to be part of the partnership with the centre.

King Saud university, which is the main case study that will be used to evaluate e-learning systems CSFs has a separate e-learning and distance learning program that is managed by a dedicated deanship. The deanship, according to its website, is one of the leading deanships in the Kingdom in the field of e-learning. In addition to managing the e-learning system throughout the university, the deanship also managed several projects that contribute to the enhancement and the quality of learning in the university. One of the main projects that the deanship if focused on is the smart city project which compromises a learning website and virtual television studio of its production and documentation centre.

In terms of the actual e-learning system the university uses, Al-Turki et al. (2016) states that a vista blackboard Learning Management System (LMS) is being adopted. This LMS is a modern LMS that is adopted by many educational institutions worldwide. It is important to mention two important observations when discussing the e-learning system that is adopted by KSU. First, clearly the university management has decided to avoid adopting Jusur e-learning system which is a system that has been locally developed by the National Centre for E-Learning and Distance Learning (NCEL) and offered free of charge to national universities. Second, there are several commercial LMS that any educational institution can purchase and amend to suits their end users' needs. This important as the concept of implementing an e-learning system, which has mentioned in several places in this thesis and has been widely mentioned in the relevant literature does not mean to actually create an e-learning system from scratch; it could simply mean choosing an e-learning system from the market that is believed to initially suits the need for that educational institution and then carry the required changes to make it suitable for the needs for the end users in that educational institution in particular.

Blackboard LMS should provide the users with some main components that allow the learning process to be effectively managed. Babu, Singh and Ganesh (2010) specify the main goal of LMS as to achieve clear instructions between the different types of user groups (e.g. instructors and students). To be able to accomplish this goal, the system has to be customisable enough to suit the different needs and levels of technical competency of the different users. Blackboard vista e-learning system is believed to enjoy these features, as it is argued by Sahasrabudhe and Lockley (2014) who state that the system has customisable menus and allows different layers of contents. Moreover, the system gives different levels of authorisation to different levels of users (e.g. teachers).

Blackboard Vista has been subjected to two evaluation studies in the context of KSU. The first study was presented by Al-Hazzani (2014) and focused on examining the students' interaction with the system. The study relied on a triangulation of qualitative (interviews) and quantitative (questionnaire) method to collect data from 19 female students who used the e-learning system as a part of their undergraduate programme. The study focused on answering three main questions that concerned the degree of interaction students have with e-learning environment, is the effect of students' academic level, specialization, experience in computer and number of courses on their perceived levels interaction, and the relationships among students perceived levels of collaborative learning, effect of use of e-learning on their learning styles, attitudes and satisfaction. The results of the study have shown that the students have issues with the difficulty levels of using the e-learning system and it was not enough to change that by enrolling in one or two e-learning based courses. More experience with technology in general and e-learning system in particular is required to be able to efficiently use the e-learning system. Moreover, the technical issues the students have faced while using the system allowed negative impression about the system to grow among these students. On the other hand, some of the students have appreciated the ease of accomplishing some tasks in comparison to traditional classroom settings; for example, the communication with the tutors and the allocations of courses assignments.

The second study that also focused on evaluating the Blackboard Vista system in KSU is the one presented by Al-Turki et al. (2016) which has focused on evaluating the usability and accessibility Of LMS Blackboard at KSU. The study has focused on evaluating the faculty members' perspectives on the subject and used a questionnaire to collect data from faculty members. The results of the study have shown that academic staff largely believe that the system is accessible to them. Al-Turki et al. (2016) have focused on evaluating certain features of the system; for example, the layout of the screens, the security log in windows, the messages that the system provides to guide the users about their actions. Al-Turki et al. (2016) argues that there is a general satisfaction with the level of accessibility the system provides and a general support for further adoption of e-learning system based education in the university.

3.8 Summary and Conclusion

This chapter has aimed to provide a full description of the context for e-learning in Saudi Arabia by introducing Saudi Arab as a country; it history, culture, and economy. Special attention was paid to elaborate on how ICT is integrated in the Kingdom in general and in the education field in particular. The chapter review the historical evolvement of introducing ICT in educational institutions, particularly at universities level. According to the material presented in this chapter, Saudi Arabia is a leading country in terms of ICT integration in the education system in the region. Moreover, the Saudi academic institutions invest large resources and they are keen on keeping up with the trends of moving towards e-learning. However, these institutions still face different kinds of obstacles, which can result in failure of the implemented e-learning systems. On the bases of the outcome of this chapter and the previous chapter, the next chapter provides the research design which will focus on the main factors that are believed to affect the implementation and acceptance of e-learning systems in Saudi institutions.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

The previous chapters have provided background knowledge about the research topic of this thesis. This chapter builds up on the outcomes of these chapters by focusing on presenting the research methodology that will be used to collect and analyse data from the study population and therefore to reach answers for the research questions raised in the first chapter.

In particular, this chapter starts by introducing three research paradigms that are currently the most used in the research arena and they are: positivist, interpretivist and pragmatic paradigms. These three paradigms are usually associated with qualitative and quantitative or a mix of the two research methodologies. These methodologies are also introduced and the relationship between them and the mentioned paradigms are discussed. Associated with these methodologies are different types of research approaches. This chapter will also focus on case study approach which will be adopted for this research project. More recently, theorists and researchers started to advocate the adoption of mixed research methods. These methods are introduced after and the pragmatic paradigm which is associated with mixed research methods is also introduced. The last part of the theoretical research methodology background will discuss the different types of data collection instruments which are also associated with the paradigm and therefore the methodologies.

The second part of the chapter presents justifications for selecting a certain set of research methods to be adopted to carry out this research project. This set of methods will be presented then the application of these research methods on this particular research project will be discussed; this includes a presentation of the different case studies where the research will take place, the selection of the samples among the study population and the reasoning for that selection and the design of the data collection instruments for the different types of samples. The design of the instruments will include the initial design of the instrument then several iterations of checks and tests to ensure that the proposed instruments are valid and reliable enough to be used for this project. Finally, the chapter briefly presents the essential ethical consideration that the researcher will adopt while carrying out the different phases of this research project.

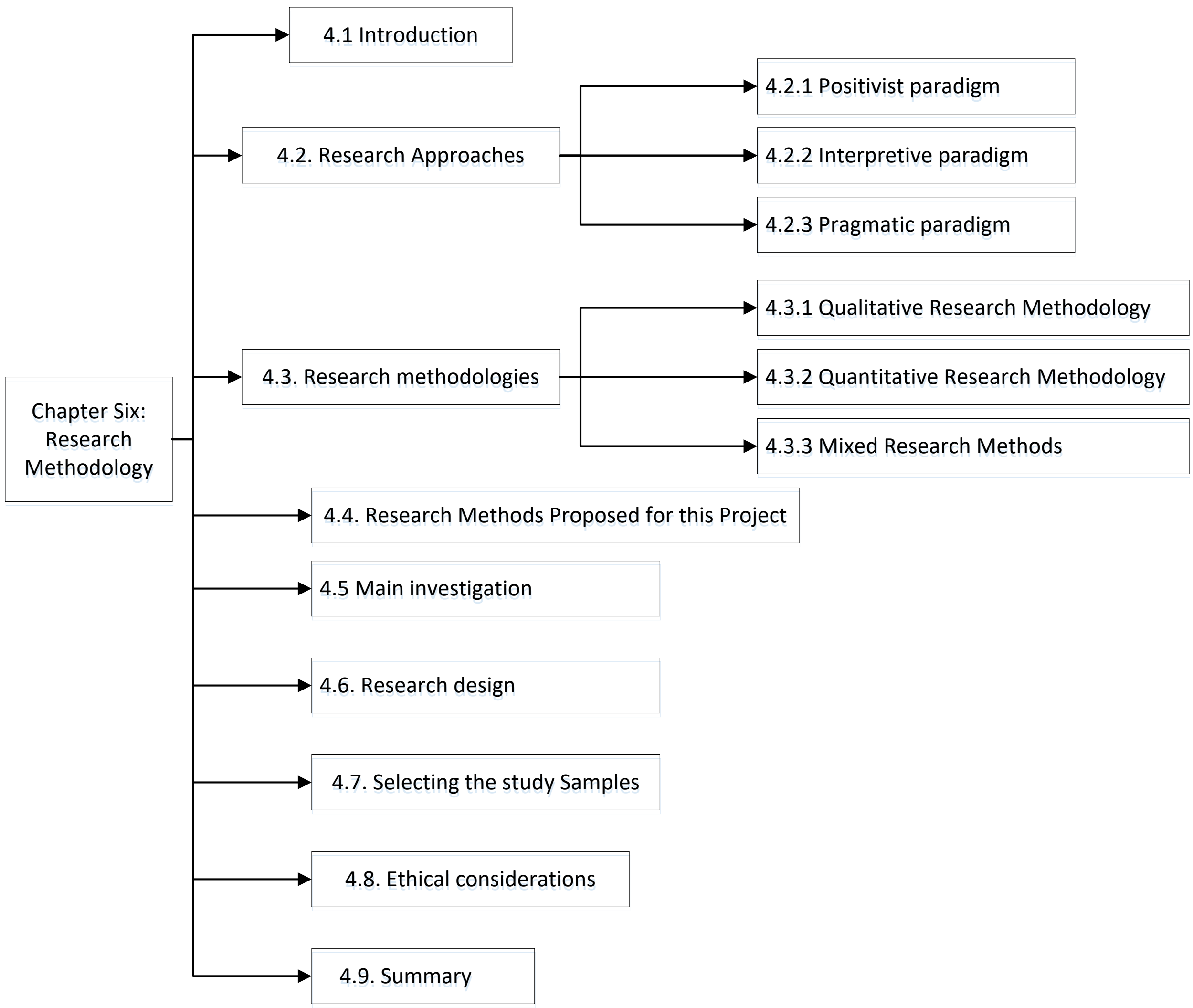

Figure 4.1 Chapter sections

4.2 Research Approaches

An academic research study, according to Mertens (2005), is an investigation that targets data collection, analysis, and interpretation of that analysis and the goal is to "*understand, describe, predict or control an educational or psychological phenomenon or to empower individuals in such contexts*". Guba and Lincoln (2005) argue that a desirable starting point for conducting any research study is to set the philosophical beliefs the researcher holds about his or her research project. These philosophical beliefs specify the nature of the project, the type of evidence the researcher is looking for to prove the research assumptions or propositions or to achieve the answers for the research questions he or she has raised at the start of the research project. Clearly setting these beliefs about the project also helps the researcher to know what limitations, obstacles, and out of control issues that might face the project. These beliefs are coined as research paradigms. A research paradigm, according to Bogdan and Biklen (1998) is "*a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research*". Over the years, different research paradigms have been invented to distinguish the different views among theorists on how to conduct an academic research study in the different science fields. The list of these paradigms is pretty long and it includes the positivist, interpretivist, pragmatic, critical, and several other paradigms. Each of these paradigms is related to a certain era and usually associated with a certain discipline of science. For example, the positivist paradigm is normally associated with natural sciences (physics, chemistry, etc.) while the interpretivist paradigm is usually associated with humanitarian and social sciences (e.g. management, educations, etc.). Pragmatism came last to overcome some of the limitations positivist and interpretivist paradigms put on the researcher, as it will be discussed in further detail in Section 4.3.3. The selection of a certain paradigm relies on the nature of the project in concern and how the researcher views that project. The following two subsections elaborate on positivist and interpretivist paradigm as the oldest and most used paradigm in research literature.

4.2.1 Positivist Paradigm

Positivism school of thinking is one of oldest schools in the research arena. According to Bhattacherjee (2012), the founder of positivism is the French philosopher Auguste Comte (1798–1857) who blended rationalism and empiricism to come up with positivism. Positivist paradigm *"has the elements of being reductionist, logical, an emphasis on empirical data collection, cause-and-effect oriented and deterministic based on priori theories"* (Creswell, 2007, p.20). The most known principle about positivist paradigm is that everything in this world, including social phenomena, can be described is a law-like style; thus, every phenomenon has a cause which leads to an effect (Chen and Hirschheim, 2004); thus, the aim of conducting a study using positivist paradigm is to prove or disprove that relationship between the causes the affect. The relationship can take the form of a hypothesis or proposition that is in question and to proof its correctness or falseness (Wynn,2001). Typically, the positivist approach uses quantitative research methods to collect and analyse data from a sample of the study community in order to inference the relationship between the cause and the effect of the phenomenon (Klein and Myers, 1999).

Following the positivist approach, the knowledge generating process attains three principles; empiricism, determinism, and generality (Cohen et al, 2007). Empiricism refers to the way knowledge is generated or obtained from experience and in a positivist paradigm; this is attained through the help of experimentation. Determinism refers to the chain of events in a phenomenon. Determination of these events and the external circumstances that causes them is vital for prediction the future and to control the future events (Dash, 2005; Cohen et al, 2007). Generality means that the outcomes of a research study can be further generalised to wider range of similar phenomena. Through positivist approach, generality starts from a certain observation or statement on the research problem, the researchers follow a deduction approach to generalise the results to world at large (Cohen et al., 2007, p.11).

Traditionally, positivist paradigm has been used in natural sciences such as physics and chemistry (Checkl and Holwell, 1998); however, many researchers adopt positivist paradigm for studies in other fields including some social studies. Furthermore, positivist paradigm relies on collecting and analysing quantitative. This point will be discussed further when the quantitative methodology is presented later in this chapter. The positivist paradigm’s strengths can be summarised as follows.

- **Generalisation**:

The results and theory from one study can be generalised to other contexts. Johnson and Onwuegbuzie (2007) state that a researcher following positivist paradigm "*an generalize a research finding when it has been replicated on many different populations and subpopulations"*, (Johnson and Onwuegbuzie, 2007).

- **Future predictions:**

Johnson and Onwuegbuzie (2007) also claim that due to the quantitative nature of the data a positivist paradigm relies on, patterns are possible to detect and therefore, future prediction are also possible.

- **Further research studies:**

Johnson (2014) argues that quantitative nature of data allows researcher to have further assumptions and therefore motivate further research studies.

On the other hand, the positivist paradigm has also accused of having several weaknesses and they are as follows.

- **Inapplicability to social phenomena:**

Houghton (2011) argues that application of positivism on social phenomena might not be possible all the tie as objectivity and empiricism cannot always be achieved in these phenomena.

- **Potential bias:**

Cohen (2007) argues that researchers might not be able to totally detach themselves from the starting hypotheses. In the few cases in which the researcher can manages such detachment, it can go to the other extreme and can harm the research process.

- **Abstract understanding of the phenomena:**

Johnson and Onwuegbuzie (2004) claim that the knowledge generated from positivist paradigm based studies can be too generic. Such generic understanding of the phenomena is hard to apply on specific situations.

- **Potential inaccuracy of scientific data:**

As it will be discussed later, quantitative data are usually collected through surveys and other quantitative methods. The data collected through these methods can be subject to many inaccuracies due to manipulations or due to the participants choosing random answers. Such inaccuracies can alter the results of the study at large. This true especially with the inflexibility of positivist paradigm in the sense that everything can be measured and calculated and therefore the researcher is obliged to abide by the outcomes of the data analysis (Johnson, 2014).

4.2.2 Interpretivist Paradigm

Researchers adopt the interpretivist paradigm believe that a subjective understanding of the individuals' experiences with the phenomenon being investigated is the main source of knowledge for a research study. Interpretivists don't believe that absolute correct or incorrect theories exist. Instead, they believe in the meanings the participants in the research problem make of it. In-depth field investigation of the phenomenon is the main route interpretivists prefer to follow in order to develop understanding of how the people who are involved in the research problem preserve it; thus, the main aim of the researcher adopting the interpretivist paradigm is to collect and analyse data from a sample of the research population through asking them about their experiences with that phenomenon (Chen and Hirschheim, 2004). The collection of the understandings of these participants describes or explains that phenomenon to the outside world. Unlike the outcomes of a positivist paradigm based study, the outcomes of an interpretivist paradigm based study is not a total generalisation for all similar phenomena and it is not law-like (Nandhakumar and Jones, 1997). As mentioned above, field studies are usually adopted as best approach to conduct an interpretivist paradigm based research study (Chen and Hirschheim, 2004); thus, the phenomenon is investigated within it is natural environment. This leads to that the outcomes of interpretivist study could be influenced by the contextual and cultural factors of the study (Myers, 1999). Moreover, Reeves and Hedberg (2003) argue that putting the analysis of the research problem within its context is essential following the interpretivist paradigm. More importantly, following the interpretivist paradigm, the researcher does not need to specify a set of research variables (dependent or independent); instead, the researcher focuses on developing a comprehensive understanding of people's understanding and interpretation of their experiences with the research phenomenon (Kaplan and Maxwell, 1994). Walsham (1995) argues that an interpretivist researcher does not aim at developing new theories but to re-evaluate and refine existing theories about the research.

4.2.3 Pragmatic Paradigm

Without attaching the research work to a certain set of beliefs or assumptions on how to solve the research problem, pragmatic paradigm focuses on the research problem itself (Mertens, 2005). Pragmatic researchers emphasise the "what" and "how" of the research problem and not on tackling it according to a predefined philosophy (Patel, 2012); thus, the research methods, data collection methods, and data analysis techniques are chosen based on what is seen by the researcher as the most suitable to solve the research problem at hand. Howe (1998) argues that pragmatists believe that both positivism and interpretivist are valid to be used in the same research process. Morgan (2007) argues that pragmatic research is driven by applied philosophy; however, it can be impacted by the cultural and circumstantial conditions of the research problem. Furthermore, some authors (e.g. Tashakkori and Teddlie, 1998) believe that while pragmatism believe in the external reality of the world (i.e. positivism) fully determining the truth is not always possible.

Yet another long debate that can be found in the literature is which research methodology should be used when adopting a certain research paradigm. Next section defines research methodology and presents the matching between research paradigms and research methodologies.

4.3 Research Methodologies

According to Leedy and Ormrod (2001), a research methodology is *"the general approach the researcher takes in carrying out the research project"*. In the research literature, the two most dominant methodologies that are discussed and used are qualitative and quantitative research methodology. Recently, several researchers (e.g. Giacobbi, Poczwardowski and Hager, 2005) have been advocating the use of a mix of the two methodologies in the same research study. Furthermore, the researchers are usually advised to use a quantitative research methodology when adopting a positivist research paradigm. Moreover, a qualitative research methodology is advocated as more suitable when using an interpretivist research paradigm. Finally, as it is briefly mentioned earlier, a pragmatic paradigm allows the researcher to use whichever methodology that he or she believes as most suitable to tackle the research problem in concern.

The following section looks at these methodologies in greater detail and discusses the research methods that can be used to carry a research study using each type of these methodologies.

4.3.1 Qualitative Research Methodology

According to Borbasi and Jackson (2012), a qualitative research aims at studying or tackling a research problem based on the involved humans' experience without relying on statistical data analysis. Moxham (2012) associates a qualitative research with naturalistic inquiry which focuses on explaining complex experiences based on humans' beings interactions. Burns and Grove (2009) argue that in a qualitative research, the researcher aims at developing a new theory through exploring a new pathway. Furthermore, these authors (Burns and Grove, 2009) compare the qualitative to the quantitative research methodology through the data collected and analysed to solve the research problem by emphasising that in a qualitative research, humans' experiences are the main object for collection and analysis in comparison to numbers and statistics which a quantitative study relies on. Hoffmann et al. (2013) highlight that a qualitative research study digs deep in the research problem through humans' experiences and feelings and does not simplify it by reducing it to mere numbers and statistics.

Nieswiadomy (2012) observes that a qualitative research study does not start with hypotheses, which is the case with quantitative methodology. Instead, a qualitative methodology can start with an observational question or a research problem statement that helps narrowing the research process down to a specific focus which the researcher can use as a guideline for his or her research. Creswell (2008) adds that a qualitative research study should be carried out in its natural settings. This, according to Creswell, helps the researcher to develop a deeper understanding of the research problem through his or her involvement. Another characteristic of qualitative research studies is that they are less structured if they were with quantitative research studies. This is due to the theory seeking nature of these studies (Leedy and Ormrod, 2001). Yet another characteristic of a qualitative study is that it relies on inductive reasoning rather than deductive one.

Trochim (2006) differentiates between inductive reasoning from deductive one by defining induction as the movement from the specific points to more generic points while deduction is the movement from generic to more specific position.

Thus, the research problem solving starts from a generic question and it gets narrowed to a specific theory as a result of the study.

A qualitative study can follow different approaches and techniques, therefore, different qualitative research studies can have dramatically different results. In principle, there are several approaches that a qualitative research study can follow. Some of the well-known among these approaches are case study, ethnography study, and content analysis study. These approaches are described next.

4.3.1.1 Case Study

Gummesson (2000) argues that there is no agreed definition of a case study; however, several authors attempted to identify case studies as a research method through identifying the goals a researcher aims to achieve through using it. For example, Creswell (2003) states that through case study method, a *“researcher explores in depth a program, an event, an activity, a process, or one or more individuals”.* Yin (1994, p.23) describes a case study as *"an empirical inquiry that:(1) investigates a contemporary phenomenon with in its real-life context when (2) the boundaries between phenomenon and context are not clearly evident and in which (3) multiple sources of evidence are used"*.

A case study method can be used to study an organisation, an event, a phenomenon, or even an individual. Within the case study method, sources for data collection can vary from observations, interviews, survey, document analysis and many other data collection instruments; thus, when adopting a case study method, quantitative and qualitative data collection instruments can be combined to obtain the most desirable data that answer the raised research questions (Grazinao and Raulin, 2004).

The case study method has several advantages. For example, Gummesson (2000) states that “*the* *detailed observations entailed in the case study method enable us to study many different aspects, examine the min relation to each other and view the process with in its total environment. Consequently, case study research provides us with a greater opportunity than other available methods to obtain a holistic view of a specific research project.* Moreover, Yin (2003) argues that through case study method, the researcher is allowed more flexibility to turn attention towards issues that matter.

Case study method has also been a subject to criticism. For example, defining the boundaries of the case study is one of the most pressing issues the researcher might face. Some case studies might have a clean-cut boundary where the insides of it are clear from the external environment. However, many of potential case studies cannot be identified within such clear boundaries and therefore, the researcher has to create his or her own boundaries of the case study (Creswell and Clark, 2007). Another disadvantage of case study approach, according to Bryman (2004), is the researcher lack of ability to generalise the results of case studies. What can be found in one organisation or event is not necessarily applicable on every similar organisation or event. Yin (2003) discusses yet other disadvantage of case study by arguing that as we as they consume long time and many resources in the data collection process itself, the also produce huge amount of unreadable documents. This leads to limiting the number of case studies a researcher can consider in a single project.

4.3.1.2 Ethnography Study

According to Creswell (2003), ethnography is a study *"in which there searcher studies an intact cultural group in a natural setting over prolonged period of time by collecting, primarily, observational data"*. The main difference between a case study and an ethnography study is that a case study can be dedicated to an organisation, an event, or even an individual. On the other hand, an ethnography study only attempts to investigate a whole group of individuals who share common cultural values (Leedy and Ormrod, 2001). In ethnography, the researcher tries to identify the different social norms, values, attitudes and attempt to detect the changes patterns in the group's culture over the period of the study. One of the main disadvantages of ethnography is that the results of a research study might be limited to the certain group where the study took place. To be able to conduct an ethnography study, the researcher needs to get involved in the daily lives of the individuals forming the group in concern. This helps the researcher in understanding the local culture and how to interpret the different social norms (Creswell, 2008). Through a gradual process, the researcher can identify the main figures in the group who will eventually use as informants to collect the data from using interviews, in addition to his or her personal observations. Once the data collected, the results report should show why the group has been chosen, what is the common culture the group shares, and how that culture did evolve over the course of the study (Leedy and Ormrod, 2001).

4.3.1.3 Content Analysis Study

The main aim of a content analysis study is to analyse the different forms of human communications. This includes books, official and unofficial documents, media documents (e.g. films), newspapers, and many other forms of human communications. Through such analysis, the researcher aims at finding patterns, misconducts, biases, and misinformation if found. Leedy and Ormrod (2001) define this method as *"a detailed and systematic examination of the contents of a particular body of materials for the purpose of identifying patterns, themes, or biases"*. To collect data for a content analysis study, the researcher has to first to create a table that count the repetition of the pattern, characteristic, or quality in a document, then a statistical report that shows the results of the first analysis. Conclusion can be drawn based on these two steps. It is important to notice that content analysis can also take the form of a quantitative method; nevertheless, many authors mainly consider it as a qualitative approach.

4.3.2 Quantitative Research Methodology

In comparison with qualitative research, a quantitative methodology involves collection data that can be quantified and statistically analysed and then used to either proof or disproof a certain claim (Creswell, 2003). Creswell (2008) claims that the origin of qualitative research methodology comes from the natural sciences fields such as physics, mathematics, and chemistry. Just like with the qualitative research studies, there are several approaches, which the researcher can follow to conduct a quantitative research study. These approaches are explained next.

According to Leedy and Ormrod (2001), there are three types of a quantitative research inquiry; descriptive, experimental and causal comparative inquiries.

4.3.2.1 Descriptive quantitative study

In the descriptive studies, the researcher aims at describing a certain phenomenon through its characteristics. The researcher can also use a descriptive quantitative research to describe the correlation between two phenomena. The descriptive research approach is a basic research method that examines the situation, as it exists in its current state. Descriptive research

involves identification of attributes of a particular phenomenon based on an observational basis, or the exploration of correlation between two or more phenomena.

4.3.2.2 Experimental

During the experimental research, the researcher investigates the treatment of an intervention in to the study group and then measures the outcomes of the treatment (Leedy and Ormrod, 2001).

4.3.2.3 Casual Comparative

The third type of a quantitative research study is the causal comparative research in which the researcher attempts to examine the effect of the dependent variables on the independent variables.

4.3.2.4 Correlational Research Study

In the correlational research study, the research examines the differences between the two characteristics of the study group. Leedy and Ormrod (2001) felt that it is crucial to observe the extent to which a researcher discovers statistical correlation between two characteristics depending on some degree of how well those characteristics have been calculated. Hence, validity and reliability are important components that affect correlations efficient. Bold (2001) noted that the purpose of a correlational study is to establish whether two or more variables are related. Creswell (2002) defined correlation as a statistical test to establish at terns for two variables. The statistical analysis of their search question can be conducted through a progression or sequence of analyses using a standard test for correlation (Cooper and Schindler, 2001).

During the development design, the researcher explores how characteristics may change over time within a study group. Two types of development designs include cross-sectional and longitudinal. In the cross-sectional study, the researcher compares two different groups with in the same parameters. Whereas, the longitudinal study is commonly used in child development research to better understand a phenomena of particular age groups or to study a group over a specific period of time (Leedy and Ormrod, 2001). In the observational study method, the researcher observes a particular aspect to human behaviour with as much objectivity as possible and records the data. This research method may provide an alternative to various qualitative research methods. In the survey research method, there searcher tends to capture phenomena at the moment. This method is used for sampling data from respondents that are representative of a population and uses a closed ended instrument or open-ended items. A survey research is one of the ways to gather data in the social sciences. The following table (4.1) (based on Godfrey and Callaghan, 2003 and Bernard, 2000) summarises the differences or compares the qualitative and quantitative research methodologies.

Method.	Features	Research approaches	Data collection tools	Strengths	Weaknesses
Quantitative	-Collected data have a numeric format. -Terms and concepts must be measurable. -Validity and reliability of data are very important. -Tend to use formal language.	-Survey -Longitudinal -cross sectional correlation	-Questionnaires -Experiments -Tests -Scales	-Classifying features and identifying patterns is easier with numerical data. -The results of data collection from a sample can be generalised on the study population. -Analysing the data is easier with the aid of computer systems. -Accuracy in the results tends to be high. -Graphical analysis is possible.	-The results can lack depth of the full image of the situation, in comparison to qualitative data results. -Data collection and analysis can be time consuming and costly. -The population can be hesitant to participate in the research. -Often requires computer analysis.
Qualitative	-Collected data are in the form of words, emotions, experiences of the people involved in the research problem. -The people are the main focus of the researcher. -The social interaction between researcher and respondents is vital for the data collection. -Informal language is used	-Case study -Action research -Historical research	-Interviews -Observations -Document reviews -Visual data analysis	-A richer image of the research problem can be developed based on qualitative data. -It is easier to identify any ambiguity in the human behaviour when a qualitative data methodology is used.	-Analysing qualitative data can be hard. Special skills are required by the researcher. -There is a possibility of bias in the analysis. -It is not always possible to generalise the results on wider populations. -Qualitative data faces difficulties in terms of comparison. -Can yield to lower levels of accuracy.

Table 4.1: a comparison between qualitative and quantitative research methodologies

Recently, some theorists started to advocate the usage of mixed research methods; thus, in the same research project, a selected set of qualitative and quantitative methods are used. Mixed research methods are described next.

4.3.3 Mixed Research Methods

Considering the weaknesses and shortcomings of quantitative and qualitative research methodologies as described in Table 4.1, recently researchers started using a mixture of research methods that allows them to overcome these issues. Reviewing the literature shows some disagreement between the authors on what constitutes a mixed methods research. For example, Brannen (2005) states that using a mixed research methods could mean using a mixture of research methods that have the same nature and philosophical principles (i.e. paradigm). For example, adopting a mixture of quantitative research method or a mixture of qualitative research methods or using different research methods from different paradigms to investigate different parts of the research problem. For example, using qualitative research methods to investigate some part and quantitative research methods for another part of the research problem.

However, authors such as Johnson et al. (2007) disagree with Brannen (2005) and argue that using different research methods from different paradigm can be considered as mixed method research. When a researcher uses multiple research methods from the same paradigm, it is can referred to as 'multi-method research'.

Another important point in the discussion is when it is appropriate to use a mixed methods research. Halcomb and Hickman (2015) argue that the researcher should measure the benefits sought from adopting mixed methods research against the costs of adopting it. Moreover, they recommend that a mixed methods research should be used when there is multiple perspectives that the researcher is trying to obtain.

The debate over the advantages and disadvantages of following a mixed research methods approach have been a subject for several research papers. The authors of these papers (e.g. Johnson, Onwuegbuzie and Turner; 2007, Brannen; 2005, Creswell and Clark; 2007; Halcomb and Hickman, 2015) argue the case for using this approach while they provide warnings concerning the hardship and the costs of using it. For example, Brannen (2005) argues that following mixed research methods approach will harness, widen, and strengthen the research skills of the researcher, especially with high demand for skilled researchers in the market and the high competition between the applicants for research positions. On the other hand, Creswell and Clark (2007) argue that using a mixed research methods approach requires substantial set of research skills that not many researchers enjoy. They also argue that the amount of resources, both financial and on the personnel level are higher than using a singular approach.

However, this increasing costs of adopting a mixed research approach to conduct a certain study comes with several benefits; for example, it is nearly agreed by all the researchers who compared this approach with singular approach (whether qualitative or quantitative) agree that adopting the mixed research approach allows a better, deeper, and more comprehensive understanding of the phenomenon being studied.

Researchers such as Greene, Caracelli and Graham (1989) and Halcomb and Hickman, 2015 argue that using multi methods to study the same phenomenon could lead to clearer, more validated and better illustrated findings. Greene, Caracelli and Graham (1989) also argues that the finding obtained from one methods of research can be used as the base for further development of the research using a different method. For example, conducting an interview with a professional who is familiar with the current status of the phenomenon before designing a questionnaire to collect the data about that phenomenon from multiple respondents. In this case, the interview allowed the researcher to get a fresh and better understanding of the phenomenon before pursuing the research using the quantitative methods. Other benefits and advantages of using mixed research methods include that they allow the researcher to detect any contradictions and ambiguities in the research questions and design; they also open venues for expanding the scope of research through allowing different parts of the phenomenon to be studied using different research methods.

In short, triangulating different research methods from different paradigms can allow the researcher to explore the research subject in a deeper and better way than using a single paradigm methods; however, this comes at a cost therefore as long as the researcher is prepared and have the suitable skills, then it is more recommended to adopt this approach.

Following this recommendation, this thesis is adopting a mixed methods research where the researcher decided to expand and update his knowledge concerning the e-learning systems in Saudi universities before delving into the main investigation about these e-learning systems CSFs. The methods which were followed to achieve answers for the research questions of this thesis are presented in the next section.

4.4 Research Methods Proposed for this Project

In the past, science fields were easy to separate and therefore, selecting a certain paradigm was easy; modern fields of science, however, tend to be multi-disciplinary; thus, the same field of science could incorporate several branches of science fields some of which could be of natural science nature while others have social science nature (Straub et al., 2005). This is true on the Information System (IS) field which this research project falls under. The IS field is related to natural, mathematics, management, behavioural, and engineering sciences at the same time. Therefore, the selection of a paradigm to suit IS project is a challenging task (Galliers, 1994). For this research project, the researcher decided to use a pragmatic research paradigm which allows him to use different research methodologies to collect and analyse data from the phenomenon population. As stated in Chapter One, this research project attempts to identify the CSFs that impact the success of implementation and adoption of e-learning systems in Saudi universities. The main constructs of this overall aim are the e-learning systems in Saudi universities, the planning, implementation, and management of these systems, and the usage of these systems by different groups of users. To achieve this overall aim, the viewpoints of all the involved users groups of e-learning systems in Saudi universities should be considered; thus, the viewpoints of the e-learning systems management should be first considered to explore the approaches and current status of the implemented e-learning systems. Moreover, three main groups of users can be identified for an e-learning system and they are the students, academic staff, and experts. Experts in this sense refers to the professionals of e-learning systems who work within an institute. These viewpoints should be also explored to identify their levels of satisfaction with the implemented e-learning system and to identify the factors that these users group believe to be more influential than other on the acceptance and success of these e-learning systems.

While usually users' or customers' satisfaction studies are conducted using a positivist paradigm (i.e. a quantitative methodology), decision makers opinions are preferred to be explored using a qualitative research methodology where the researcher is able to investigate in more depth these decision makers' opinion about matters in concern. Relying purely on quantitative research methods using numerical and statistical data to explore these viewpoints can fail to deliver the desired depth of these viewpoints. For those reasons, a qualitative research is more suitable to investigate the planning, implementation, and management of e-learning systems.

On those bases, the researcher decided to divide the research methodology followed in this research project into two main stages that allow the exploration of all these viewpoints in a suitable manner that fulfils the planned objectives. First, experts at e-learning management stage which aims at exploring the current status of e-learning systems in Saudi universities in terms of their implementation and the degree of importance of different categories of factors in terms of their influence on the success of e-learning system. This stage also aims at creating an up-to-date knowledge of e-learning system in different Saudi universities. This investigation targets experts at e-learning systems management level point of view therefore it follows a qualitative methodology. The actual methodology, data collection and analysis of this stage has been presented in Chapter Six (Preliminary Study chapter).

The second stage of this research project build up on the outcomes of the first stage and focuses on identifying the most important CSFs from the potential users' point of view. This stage follows a quantitative research methodology and explores the viewpoints of experts, academic staff and students as main users' groups. Moreover, this stage focuses on one Saudi university rather than three universities, which were used as a sample in the first stage. The remaining parts of this chapter presents the research methods proposed for this stage. The following graph shows the progress of this research project.

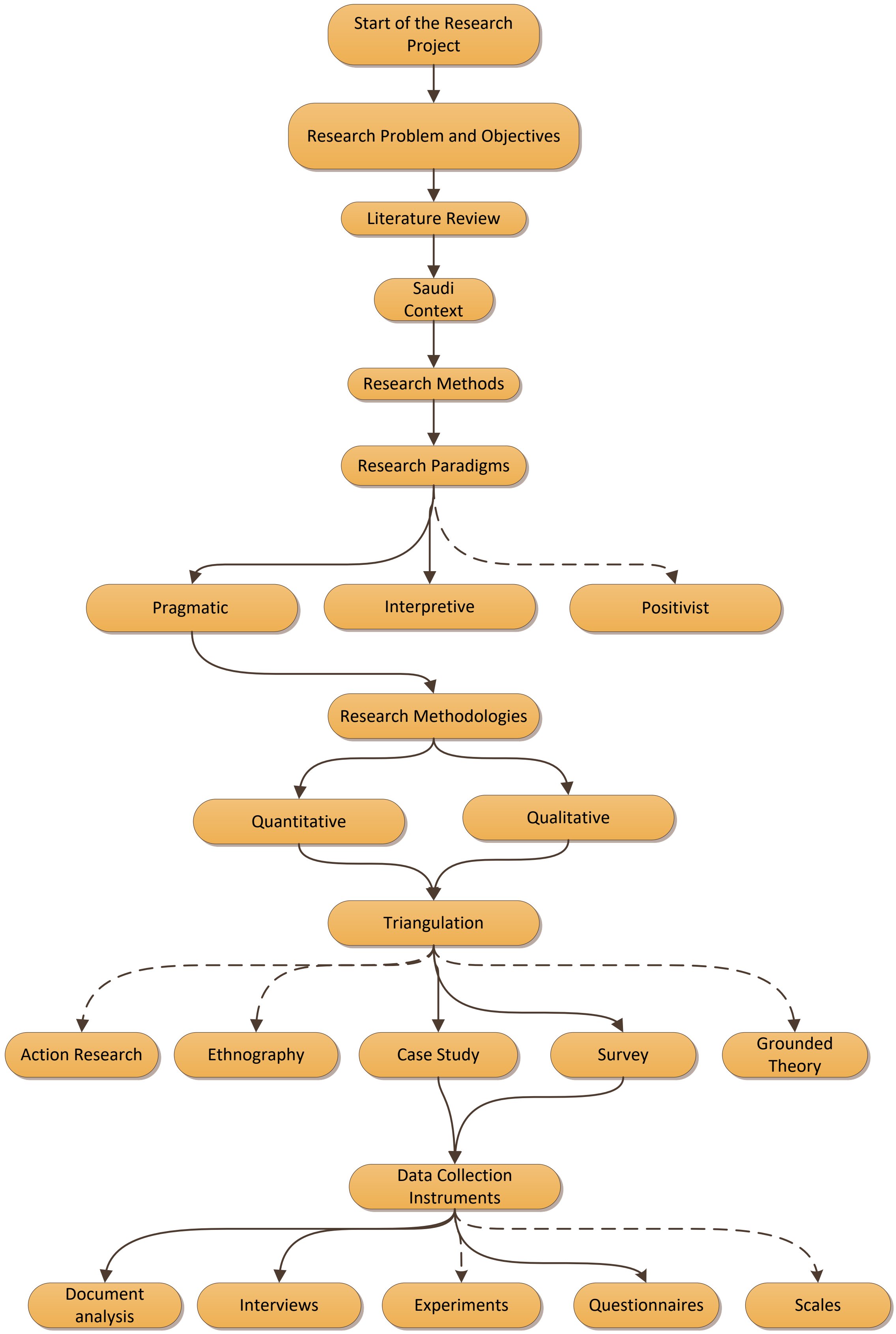

Figure 4.2: Stages of this research project

The following sections elaborates on the different stages of the proposed research methods for this research project.

4.5 Main Investigation

The second part of the proposed research methods for this research project composes the main investigation that aims at identifying the CSFs of e-learning in Saudi Arabia from a wider angle by getting more user groups involved. This stage targets collecting data from three main groups of e-learning systems users of e-learning system in one Saudi university. This stage also adopts a case study approach similar to the first stage; nevertheless, instead of using three universities as case studies as it was the case in the first stage, this stage uses one case study only. This will allow the researcher to gather data from more participants in students, academic staff, and experts categories. The selected case study is King Saud University. This stage has adopted a case study approach for similar reasons that approach was adopted in the first stage; thus, the ability to get deeper insights on the research problem and to be able to identify the borders between the research problem and its environment. Furthermore, reducing the number of case studies from three to one in the second stage will hopefully help the researcher to get even deeper insights on the research problem through the focus of data collection and analysis on one example of an e-learning system in a Saudi university. This is in light of the facts that King Saud University is the oldest university in the Kingdom; moreover, the University was one of the first Saudi academic institutes to implement an e-learning system. In term of its population, King Saud University is the biggest university in the Kingdom as well. Another reason which supports the decision to choose King Saud University as a case study for the main investigation stage is the fact that the researcher is an academic staff in the university which allows him to access more resources and reach more people both through his personal contacts and through the support of the university management.

Different from the first stage, this stage argues that a quantitative methodology is more suitable for data collection and analysis. More specifically, the second stage (the main investigation), uses a survey approach.

4.6 Research Design

In research design, the overall preparation of the survey method is the main focus. In this step, the researcher focuses on identifying the dimensions that represent the different aspects of the research problem he is investigating. This step also includes designing the actual data collection instrument, its validation, and conducting pilot studies to check the suitability of the proposed design for the potential respondents.

4.6.1 Dimensions (variables) Identification

Pre to writing to the actual survey questions, the researcher focuses in this stage on identifying the main factors or categories of factors that he or she is trying to measure. This helps the researcher to identify the suitable questions that represent the different aspects of these dimensions. Dimensions in this sense refer to the variables that represent the different sides of the research problem and affect or get affected by other factors (Fraenkel and Wallen, 2004). The identification of these variables helps the researcher to design and divide the survey questions that target each variable separately (Arleck and Settle, 2004). Based on their influence, research variables can be divided into dependent and independent variables. Dependent variables are those can be influenced by other variables while independent variables are those that can influence the other variables. In order to identify these variables, the researcher carried out a literature review which was presented in Chapter Two and Chapter Five.

Dimension	Items	Sources
Instructor characteristics	Instructor's enthusiasm while teaching using e-learning tools	Selim (2007), Taha (2014), Puri (2012), FitzPatrick (2012), Paechter, Maier and Macher (2009)
	Instructor's ability to motivate the students to use the e-learning system	
	The clarity of instructor's explanation of the e-learning components	
	Instructor's ability to use the e-learning system effectively	
	Instructor's style of teaching using e-learning technologies	
	Instructor's friendliness in general and while teaching	
	Instructor's ability to motivate students to get engaged in online discussions	
Student characteristics	Students' willingness to participate in e-learning.	Puri (2012), Taha (2014), Selim (2007), Paechter, Maier and Macher (2009)
	The student's learning style affecting the use of e-learning.	
	The student's ability to find things in eLearning system	
	Student's experience and knowledge about computers	
	The level of student's enjoyment while using technology	
	The student's understanding of the e-learning system parts	
Technology Infrastructure	Easy access to internet.	Taha (2014), Ahmed (2013), Musa and Othman (2012), Selim (2007), FitzPatrick (2012), Paechter, Maier and Macher (2009)
	Browsing is easy	
	Availability of online communication tools.	
	Internet speed	
	Availability of multimedia tools/technologies	
	Ability to search for learning material using the website	
	Availability of sufficient computer labs	
	Reliable technical infrastructure.	
e-learning systems and Online learning resources	Ease of registration on e-learning course	Taha (2014), Wannasiri, Xaymoungkhoun and Ciganek (2009), Puri (2012), Selim (2007), FitzPatrick (2012)
	Access to the e-learning resources on and off campus	
	The layout and design of information	
	Ease of learning material preparation	
	Language Support	
	Sufficiency of the learning materials	
	Course interactivity	
	Availability of communications with the instructor in the eLearning system	
	Availability of online test/quizzes	
	Option to return to unfinished tasks	
	Measurement of learning progress	
	Whether the learning material is up-to-date	
Support and training	Availability of offline technical support	Madina (2014), Puri (2012), Selim (2007), FitzPatrick (2012)
	Friendliness of support team	
	Availability of online help desk	
	Availability of training	
	Availability of on campus printing facilities	

Table 4.2: a summary of literature review findings on e-learning CSFs

researchers' work on similar cases and to check what variables and factors they have considered. The following three tables show the results of this literature review.

Yet another category that has been considered by researchers is the demographic characteristics of the potential respondents. Other researchers have considered different demographic characteristics when collected data from students than when collecting them from academic staff and experts. The following table shows the demographic factors which were considered when collecting data from academic staff and experts.

Factor	Sources
Age	Selim (2007), Taha (2014), Puri (2012), FitzPatrick (2012), Albalawi (2012), Siri et al. (2009)
Gender	Selim (2007), Puri (2012), Taha (2014), Albalawi (2012), Alshangeeti, Alsaghier, and Nguyen (2009), Siri et al. (2009)
Nationality	Albalawi (2012), Siri et al. (2009)
Education level	Albalawi (2012), Alshangeeti, Alsaghier, and Nguyen (2009)
Academic faculty	Albalawi (2012), Alshangeeti, Alsaghier, and Nguyen (2009)
Academic department	Albalawi (2012)
Academic position at the university	Albalawi (2012), Siri et al. (2009)
Years of teaching experience	Taha (2014), Alenezi (2012), Alshangeeti et al. (2009)
Years of e-learning based teaching	Taha (2014), Puri (2012), Selim (2007)
How often do you use the internet (for personal or professional purposes)?	Albalawi (2012)
How often do you use the internet for work purposes?	Taha (2014), Albalawi (2012), Alenezi (2012)
How many e-learning workshops have you attended?	Albalawi (2012), Abu-Bakar and Ayub (2009)

Table 4.3: Literature review summary on demographic data for academic staff and experts

For students, the considered factors were moderately different. The following table shows the found factor and the source studies.

Factor	Sources
Age	Selim (2007), Taha (2014), Puri (2012), Patrick (2012), Al-Balawi (2012), Siri et al. (2009).
Gender	Selim (2007), Puri (2012), Taha (2014), Albalawi (2012), Al-Shangeeti, Al-Saghier, Nguyen (2009), Siri et al. (2009), Puri (2012)
Nationality	Albalawi (2012), Siri et al. (2009)
Academic faculty	Al-Balawi (2012), Al-Shangeeti, Al-Saghier, Nguyen (2009)
Your academic department	Al-Balawi (2012)
Year of study	Taha (2014)
Study level (postgraduate vs undergraduate)	Al-Balawi (2012)
Years of e-learning based learning	Taha (2014), Puri (2012), Selim (2007)
Frequency of using the internet	Albalawi (2012)
Frequency of using the internet for study purposes?	Taha (2014), Al-Balawi (2012), Al-Enezi (2012)
Length of internet usage sessions	Al-Balawi (2012).
Experience with e-learning systems	Taha (2014).

Table 4.4: Literature review summary on demographic data for students

Based on this literature review and the researcher's understanding of the research problem, and the following figure shows the independent and dependent variables for this research project.

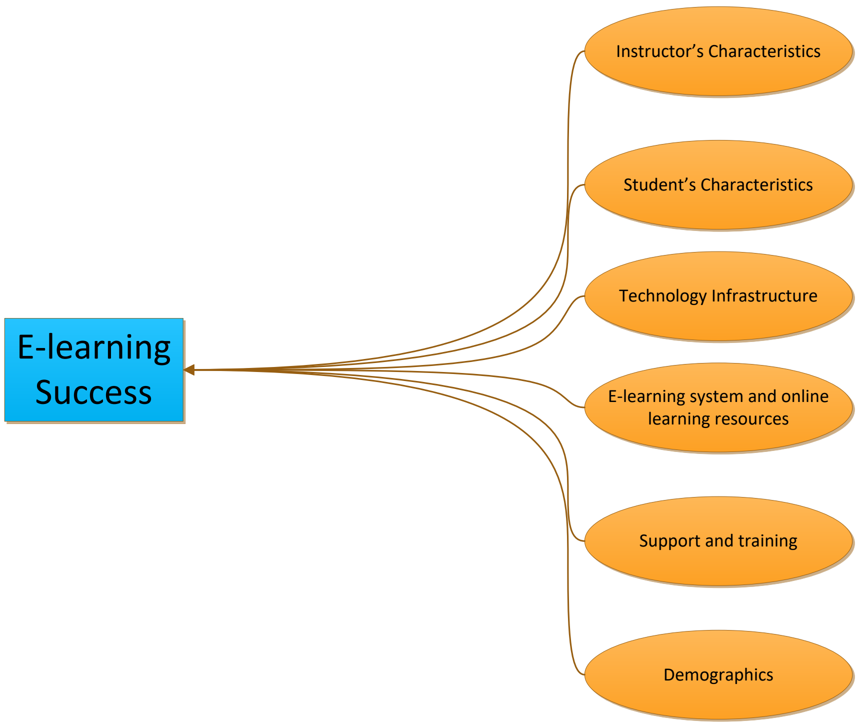

Figure 4.3: The relationship between independent and dependent variables.

Figure 4.2 above shows six independent variables (the orange ovals) and one dependent variable (the blue rectangle). These variables have been identified based on an intensive literature review of relevant research studies.

4.6.2 Preparing the Instrument

Once the research variables have been identified, the researcher needs to decide on the format in which the questions that measure these variables will be presented to the respondents in. Fraenkel and Wallen (2004) categorise surveys into three different types based on their questions formats.

- **Questionnaires.** In a questionnaire, the subjects respond to the questions by writing or, more commonly, by marking an answer sheet.
- **Self-Checklists.** A self-checklist is a list of several characteristics or activities presented to the respondents which they are required to study and place a mark opposite the characteristics that matches them.
- **Attitude Scales**. These are based on the assumption that attitudes of respondents can be obtained through the analysis of their answers to a set of statement of preference.

In this research project, questionnaires are believed to be the most suitable format of survey to achieve the objective of identifying the most CSFs that impact the success or failure of an e-learning system. This is due to the fact that questionnaires allow the researcher to collect deeper data than self-checklists and attitude scales at the same time while allowing the respondents to express their opinions about the matter in concern more freely. According to Babbies (1990*), "a questionnaire is defined as a document containing questions and other types of items designed to solicit information appropriate to analysis" (p.377).* Once the format is decided, the researcher can actually start writing the questions. The researcher is not obliged to develop a set of unique questions that never been used before to investigate similar events or phenomenon. Reviewing other similar survey studies in literature can help as guidance for the researcher on how to write his or her questions (Fowler, 2002). Researchers tend to follow the same format to write all the questions in one survey. This helps general consistency of the survey in addition to reducing the ambiguity and cognitive load of the respondents (Singleton and Straits, 2002).

There are several considerations in designing the questions that the researcher should take into account. For example, the same question should mean the same for all respondents; thus, the same question will have the same interpretation by all respondents. Moreover, a question should start with accurate assumptions about the respondents. For example, a question such as "*are you satisfied with our new product*" has the assumption that the respondent has actually acquired the product in concern in the past. Nevertheless, if the researcher is not sure about the respondent's experience with the product or service, a leading question should be first provided; for example, "have you consumed our product before?", and then the main question can be asked (Fraenkel and Wallen, 2004).

4.6.3 Designing the e-learning CSFs Questionnaire

Following the guidelines discussed in the previous section, the researcher started the process of designing the actual questionnaires. The design was in light of the literature review developed in the Chapters Two and Five concerning the CSFs that impact e-learning systems success on an international scale and the results of analysing data collected in the first stage presented earlier in this chapter which specifically shed a light on these CSFs in a Saudi context according to experts in Saudi universities.

As mentioned earlier in section 4.3.2 , the quantitative research approach will be used to collect data from three samples of academic staff members, experts and students; thus, a sample from each of these populations will be asked to fill a questionnaire that covers the different research variables and their impact and importance in terms of e-learning system success. The questionnaires were designed in a similar style and contain three main parts, which include several subsections. Collecting data from different respondent groups using similar data collection instrument facilitate conducting comparative analysis of the attitude between these groups regarding the point they are being asked about.

More specifically, the proposed questionnaires design starts by a general introduction that is suitable for the intended respondents' populations (e.g., academic staff, experts or students). The introduction introduced the research project and the purpose of carrying out such research, and thanked the respondents for dedicating time to complete the questionnaire.

The remaining of the questionnaires composed of two different sections, each focuses on collecting certain type of data that can help achieving the aim of this research project; CSFs section focuses on identifying the importance the respondent give for different e-learning CSFs.

The demographics section collects data about the respondents' demographics status. The purpose of adding a demographic data section is to allow carrying out comparisons of attitude toward the point in concern with the same group of respondents. For example, do final year students respond different or evaluate the system differently from first year's students. Moreover, are there any differences in attitude between male and female respondents?

While there are clear differences between students and academic staff and experts in the demographic section, the other sections are majorly similar to each other in both questionnaires. However, the language used in each questionnaire is selected to suit the respondents of that questionnaire. For example, when asking the students about their characteristics, the question used "my" before the main question statement; for example; "my enthusiasm to use the e-learning system". The same style has been applied on academic staff and experts' questionnaire. These parts are explained further next.

4.6.4 CSFs Importance

The first part focused on measuring the importance that the respondents give to the different proposed CSFs that are found in the literature and identified in the first stage of this research. This part contained 39 different questions that are divided on five different categories of CSFs. Each of these categories is explained in more details in the following subsections.

4.6.4.1 Instructor's characteristics

The instructor's characteristics category contained seven different Likert scale questions that ask the respondent to specify the level of importance of eight different instructor's characteristics from unimportant to very important. These instructor's characteristics included their enthusiasm during teaching using e-learning tools, their ability to motivate the students' to use e-learning tools, the clarity of instructor's explanation of e-learning components, their ability to use e-learning tools effectively, their style and approach of teaching while using e-learning tools, their relationships with the students and students' comfortability while the instructor uses e-learning tools to explain the learning materials, their ability to motivate the students to get involved in online discussions.

4.6.4.2 Student's characteristics

The second category of e-learning CSFs focused on measuring the importance of student's characteristics in impacting the success of the e-learning system. This category includes six different Likert scale and they attempted to measure the importance of the student's readiness to use e-learning tools, their style of learning, their ability to find things in e-learning system, their level of knowledge with computers and technology in general, the level of enjoyment they have while using e-learning tools, and their ability to understand of the purpose of the different components of an e-learning system.

4.6.4.3 IT infrastructure

The third category of CSFs focused on the importance the respondents give to the technical parts of the e-learning environment. More specifically, this category attempted to measure the importance of the IT components which the e-learning system is built upon. This art contained another eight Likert scale questions and they attempt to measure the importance of the ease of accessing the internet, the difficulty of free browsing, the availability of communications channels over the internet, the internet speed, the support of multimedia facilities, the availability of search facility to look for learning materials over the internet, the availability of enough computer laboratories, the availability of trustworthy IT infrastructure.

4.6.4.4 e-learning System and Online Resources

The largest category of the five categories in terms of the considered factors number has focused on the e-learning system itself. This category contains 12 different factors in the academic staff questionnaire and 11 factors in the students' questionnaire. These factors followed Likert scale questions which allow the student and the academic staff to rate the importance of a factor from unimportant to very important. The 12 factors concerning the e-learning system and the online resources focused on ease of registration on e-learning course, access to the e-learning resources on and off campus, the layout and design of information, ease of learning material preparation, language Support, sufficiency of the learning materials, course interactivity, availability of communications with the instructor in the e-learning system, availability of online test/quizzes, option to return to unfinished tasks measurement of learning progress, whether the learning material is up-to-date. The only factor that is not listed in the students' questionnaire is the ease of learning material preparation as it is not part of the students' usage of the e-learning system.

4.6.4.5 Support and Training

The last category has focused on obtaining the label of importance the respondents give to the availability of training and support facility as part of the e-learning environment. Five different factors have been considered under this category and they concerned the availability of technical support; the friendliness of the technical support team; the availability of online support centres; the availability of training on how to use the e-learning system; and the availability of printing service within the campus.

4.6.5 Demographics

The last part of the questionnaire focused on collecting the demographic data of the respondents. These data will help the researcher to understand the differences between the different demographic groups of respondents (e.g. males vs. females) opinions on the CSFs that affect the success of an e-learning system. For both students and academic staff, this part contained 12 different questions that took a multiple answer questions format. Nonetheless, some of these questions are different between students' and academic staff questionnaires.

In the students' questionnaire, these questions collected data about the age of the student, their gender, their academic faculty, their academic department, their academic year, their level of study (undergraduate or postgraduate), years of e-learning based education, the frequency of, number of times the students use the internet for studying purposes, length of periods the students use the internet, and whether the student have use an e-learning system or not.

In the academic staff questionnaire, the questions were targeting collecting data about the academic staff's age, gender, nationality, academic level, academic faculty, academic department, academic position in the university, years of teaching experience, years of e-learning based teaching experience, number of times the respondent uses the internet for both personal and work purposes, number for times the respondent uses the internet for work purposes only, and number of workshops and courses the that concern e-learning the respondent attended.

4.6.6 Pre-Pilot and Pilot Studies

van Teijlingen and Vanora Hundle (2001) suggest that a pilot study can be used as an imitation of the actual study, however, in a much smaller scale. This will prepare the researcher for the actual research study in terms of what to expect, the required time to conduct the data collection, and what issues might arise during the actual study. Moreover, a pilot study can help the researcher in checking that the designed data collection instrument will actually collect the desired data that measures the specified research variables and to eliminate any issues in the designed data collection instrument (van Teijlingen and Vanora Hundle, 2001).

In this research project, two stages of pilot studies have been performed. A pre-pilot study and a pilot study. The pre-pilot study was conducted by 5 Saudi students and 4 Saudi academic staff who are currently studying in the UK. The purpose of this pre-pilot study is to check for any major issues in the questionnaire design. The researcher handed a printed version of the questionnaire to the respondents who were randomly selected as long as they are either student in a Saudi university (before they come to study in the UK) or they held an academic position (before they come to do postgraduate studies in the UK). In the pre-pilot study, the researcher has personally explained the questionnaire and the purpose of the research project to each of the respondents. In some cases, the researcher needed to explain certain parts of questions of the questionnaire to certain respondents. Once the questionnaires were filled and collected from the respondents, the researcher have analysed the collected data with a focus on issues the respondents faced while filling the questionnaire. The results of this analysis have shown a few issues in about 8 different questions in both students' and academic staff questionnaires. The respondents faced certain difficulties in understanding some questions. This is an issue as vague questions may not communicate the intent meaning and limit the usefulness of the results and consequence inaccuracies. The following table (4.4) illustrate the problematic questions, why they were a problem fort the participants as well as, how these questions can be improved in order to give a clearer intended meaning.

A pre-pilot study			
Instructor characteristics			
N	**Problematic Questions**	**The Problem/Confusion**	**improved Question**

I4	Instructor's ability to use the different e-learning system parts effectively	It was not clear for the participate as to the meaning of *'using different e-learning system parts effectively'*	Instructor's ability to use the e-learning system effectively.
I8	Instructor's care for students on personal level in educational settings	The participants required further explanation of the conveyed meaning. They also stated the irrelevance of stating in educational settings"	Instructor cultivating a caring relationship with the student.
		Student characteristics	
S2	My learning style	The question was seen as double-barrelled and incomprehensible; Participants suggested clarifying the meaning by giving more details of the intent question.	My learning style is affecting my use of e-learning.
		Technology Infrastructure	
T2	Problem free browsing	This question was also seen as double-barreled and vague. Participants suggested omitting the term "problem" or adding some words to clarify the meaning.	Browsing is easy.
T7	Availability of enough computer stations	This question was seen double-barreled and conveyed more than one meaning, also being unclear. Participants questioned if the number of computer labs is what the question was asking.	Availability computer labs.
		e-learning systems and Online learning resources	
E2	Language Support	The participants believed that this factor is under the inappropriate title and relevant to the Support and training factors category.	No change is required
E9	Availability of communications with the instructor.	This question was seen as repeated to question E13 (course interactivity with instructor and student)	No change is required
		Section B: Demographic statistics	
D10	How often do you use the internet (for personal or professional purposes)?	Participants saw the irrelevance of asking about their personal use of the internet.	No change is required

Table 4.5: Correction based on the pre-pilot studies

While the researcher believes that the respondents were right in facing issues in the six questions in the previous table; the researcher also believes that the last three questions in the table are clear enough therefore they were left without much changes

The first version of the questionnaire was prepared in English language. This is mainly due to the fact that the vast majority of the related research was the e-learning CSFs in the questionnaire came from were in English language and to be able to present the questionnaire and any relevant work to the supervisor. Nonetheless, this research project aims at identifying e-learning CSFs in Saudi Arabia; thus, the respondents' main language is Arabic; therefore, it is vital to translate the questionnaire into Arabic.

To do so, the researcher has first prepared his own translation of the questionnaire. This version was presented to two different translators who have experience in translating from English to Arabic and vice versa. The translators have suggested several changes which were implemented on the questionnaire. Once the translated questionnaire was ready, the next step was to carry out a second pilot study, which was wider in the scope and more resembling to the actual research study as it was conducted with respondents who are currently students or academic staff in a Saudi university. To conduct this pilot study, the researcher used his personal contacts with academic staff in King Saud University who helped him to collect data from both students in the university and other academic staff. The researcher relied on electronic mediums to send a single copy of each questionnaire, which then was printed out locally in the university and distributed to the potential academic staff and students by a colleague in the university. The colleague has distributed 50 copies of each questionnaire. Nevertheless, 21 students and 12 academic staff have actually returned the filled questionnaire. Once the filled questionnaires were delivered back to the UK through the post, the researcher have analysed the data in these questionnaires. The results have shown that the respondents have faced issue with five different questions and some have suggested removing them. These questions and the issues raised by the respondents are presented in table 4.6 below.

Pilot study			
Instructor characteristics			
N	**Problematic Questions**	**The Problem/Confusion**	**Developed Question**
I8	My cultivating a caring relationship with the student	Does not add much more than what I6 add to the questionnaire	To be removed
Student characteristics			
S3	The student's ability to navigate the different parts of the e-learning system	Ambiguity	The student's ability to find things in e-learning system.
S6	The student's understanding different parts of the e-learning system	Too generic	The student's understanding of the purpose of different parts of the e-learning system
e-learning systems and Online learning resources			
E3	The presentation of information on the website.	Ambiguity	The layout and design of information.
E6	Sufficiency and relativity of the learning materials to the courses.	Can be shortened for clarity	Sufficiency of the learning materials
E8	Availability of communications with the instructor.	Too generic	Availability of communications with the instructor in the e-learning system.
E12	The currency of the available learning material.	Ambiguity	Whether the learning material is up-to-date.
E13	Computer network is reliable	Already covered in technology infrastructure T8.	To be removed

Table 4.6: Correction based on the pilot studies

While the above table have shown only the structural problems in the questionnaire (problem in its design), there are a few other questions were the Arabic translation was not

clear to the respondents. Therefore, a tighter and more professional translation is required.

4.7 Selecting the Study Samples

As it was mentioned in several places of this chapter, the data will be collected from three different groups of e-learning system users; academic staff, experts, and students. As collecting data from each expert, member of staff and each student is not possible due to their large numbers, a sample of each groups of users is usually selected to represent that group. Selecting a sample of the study population is a well-known technique in academic research practice. According to Fink (2003), *'a sample is a proportion or subset of a larger group called a population...A good sample is a miniature version of the population of which it is a part – just like it, only smaller.'* Over the years, theorists in research methods arena developed several ways for selecting a representative sample from the study population.

Rowley (2014) discusses two main approaches to selecting a sample and they are probability and non-probability sampling. Probability sampling means that every member of the population has a known chance(probability) to be selected as a member of the sample. An advantage of this approach is that the results from analysing the data collected from a probability sample can be generalised on the wider population. On the other hand, non-probability sampling, the chance for a member of the population to be included in a sample is not know which leads to that the sample might not accurately represent the population. They are different techniques that can be used with each of these approaches and they are discussed next.

4.7.1 Simple Random Sampling

One of the well-known probability sampling techniques is simple random sampling. As the name of this approach reflects, it is the simplistic yet very effective approach to select a sample from the study population. This approach relies on a simple principle which is that every member of the study population has the same opportunity to qualify as a member of the selected sample. The researcher puts no previous criteria that a member of the study population needs to fulfil in order to qualify as a sample member. The researcher randomly collects data from any member of the study population until achieving certain numbers (the recommended sample size (discussed later in this chapter) of respondents.

4.7.2 Stratified Random Sampling

Another technique to select a sample from the study population following the probability sampling approach is the stratified random sampling which is similar to the random sampling approach, nevertheless, before randomly selecting sample members, the study population is divided into different classes based on a given criteria (e.g. males vs females, employed vs. unemployed). The basic principle of stratified sampling approach is to select enough members from a certain class that represent the weight of that class in the study population. For example, if the ratio of males to females was 2 to 1, then for every randomly selected female, two males are also selected. The most important step in thee stratified random sampling is to find the right criteria that divide the study population into classes and the ratio of each class in the study population based on these criteria. The following diagram shows a population that is divided into males and females' classes where the number of males is double the number of females.

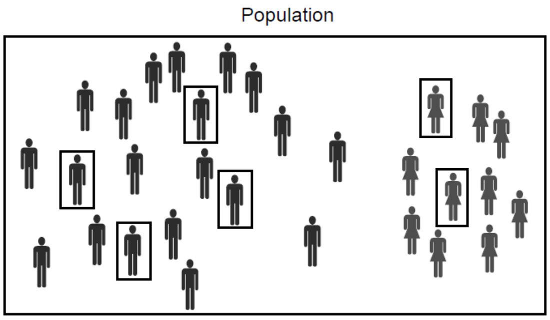

Figure 4.4: Stratified sampling technique

4.7.3 Systematic Sampling

Systematic sampling is one of the techniques that are used following non-probability sampling. It is straightforward one and it relies on the researcher specifying certain gaps between a chosen sample member and the next member to be selected. For example, the researcher chooses the multipliers of three to be the location of the population members that will be selected for the sample. Thus, the third, sixth, ninth, twelfth, etc. The following diagram shows how the systematic sample is selected.

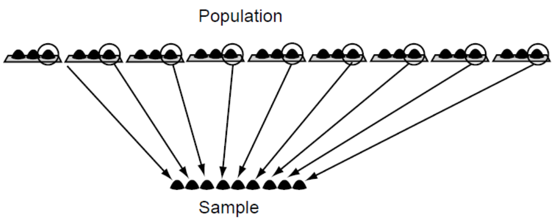

Figure 4.5: Systematic sampling technique

4.7.4 Convenience sampling

Another technique that is used following the non-probability approach for sampling Is called convenience sampling. The name comes from that the researcher rely on collecting data from population member who he or she can conveniently access. Moreover, the population is usually has clear borders where the researcher can identify the members (e.g. an organisation, geographical area, a membership to a club etc.)

Convenience sampling has been followed in this research project as it allows faster data collection while being less expensive and time consuming. This is mainly due to the fact that the researcher has carried all the research work on his own which limit the available resources in terms of time, money, and personnel.

4.8. Ethical Considerations

An essential part of carrying a research study is to do it according to a certain ethical code. Working with human participants, just like the case of this research project has made ethics followed during the conduction of a research study an important subject for a wide research work. This is due to the social and moral responsibilities put on the researcher's shoulder to guarantee the safety and confidentiality of the human participants in the research (Ghauri and Gronhaug, 2005). It's the researcher's responsibility to protect the participants in the research from any physical or emotional harm that they might be subject to due to the unethical methods of research. Another form of participants' protection during a research is the protection of their identity or any other personal information that can be compromised by unauthorised parties. Anonymity of the participants should be protected all the time. The researcher should be aware of the participants' cultures and social values. Obtaining a clear consent from the participants to be part the research study is yet another ethical consideration that the researcher should put in mind.

While conducting this research project, the researcher tried to follow these ethical considerations and many others. Among the consideration that are specific to this research project is the local culture where the project is taking place (Kingdom of Saudi Arabia). Saudi culture is particularly centred around religious and tribal value where segregation between males and female is strictly applied. This would affect the research in the sense that data collection will be facilitated through the help of some female assistant to collect data from female academic staff members, students, and experts

During the data collection stage, the researcher will provide a detailed overview of the research project and its objectives. Agreeing to fill the questionnaire by either the students, the staff members, or the experts will be treated as consent. As it was shown in the questionnaire design, no data that might lead to revealing the identity of the respondent is intended to be collected.

Another dimension of the ethical code the researcher has followed while collecting the data is respecting the respondents' time and convenience. This is especially true when interviews were conducted as the researcher made sure that the selected time and place for the interviews were chosen by the respondents according to their schedule. The researcher made sure to turn up on time and to leave without causing distraction to the respondents.

In terms of the relationship between the researcher and the respondents, the researcher made sure that professional level of communications is always maintained. Once the data collection process concluded, the researcher left his contact details in case the respondent required further information about the research and to assure them about the professionalism followed when dealing with the collected data.

4.9. Summary

The research methods proposed to carry out this research project are divided into two parts; a qualitative research methodology to conduct a preliminary study (Chapter Six) and a quantitative methodology to conduct the main investigation that focuses on the perspectives of three e-learning users' groups in KSU and they are students, academic staff, and experts.

The chapter presented the main research paradigms discussed in the relevant literature and argued to use a pragmatic paradigm as the most suitable to serve the purpose of this research project. Associated with the pragmatic paradigm, mixed research methods were argued to be more beneficial in order to reach the desired answers for the raised research questions. Mixed research methods entail using both qualitative and quantitative research methods. As such, the qualitative research methods will be used in Chapter Six which aims at updating the current status of e-learning CSFs research in three Saudi universities. Building on the outcomes of Chapter Six and on an intensive literature review that surveyed the relevant research that investigated similar research problems within other contexts, the research methods which are used in the main research investigation. In particular, the proposed research methods are of a quantitative nature and they are proposed to collect data from academic staff, students, and experts in King Saud University as a case study and a sample of Saudi universities. These quantitative methods are represented by proposing a design of two questionnaires. The design of these two questionnaires, pilot studies, and relevant corrections were also presented. The last part of the chapter elaborated on the ethical consideration that the researcher will put in mind while carrying out the research procedures (e.g. interviews and questionnaires). The material provided in this chapter prepare for the actual research to be done and presented in the following two chapters where the results of collecting and analysing the data will be presented and explained.

CHAPTER FIVE: RESEARCH DESIGN

5.1 Introduction

On the basis of what has been presented in the previous chapters, this chapter provides the main e-learning CSFs that will be considered in this research project which will be used build research instruments in the next chapter. This chapter is composed of one main section (5.2) which introduces five different categories of e-learning CSFs (i.e. instructor characteristics, students' characteristics, technology Infrastructure, e-learning systems and online learning resources, and support and training categories). Each of these categories is explained and the factors considered within it are presented. The chapter is summarized in section 5.3.

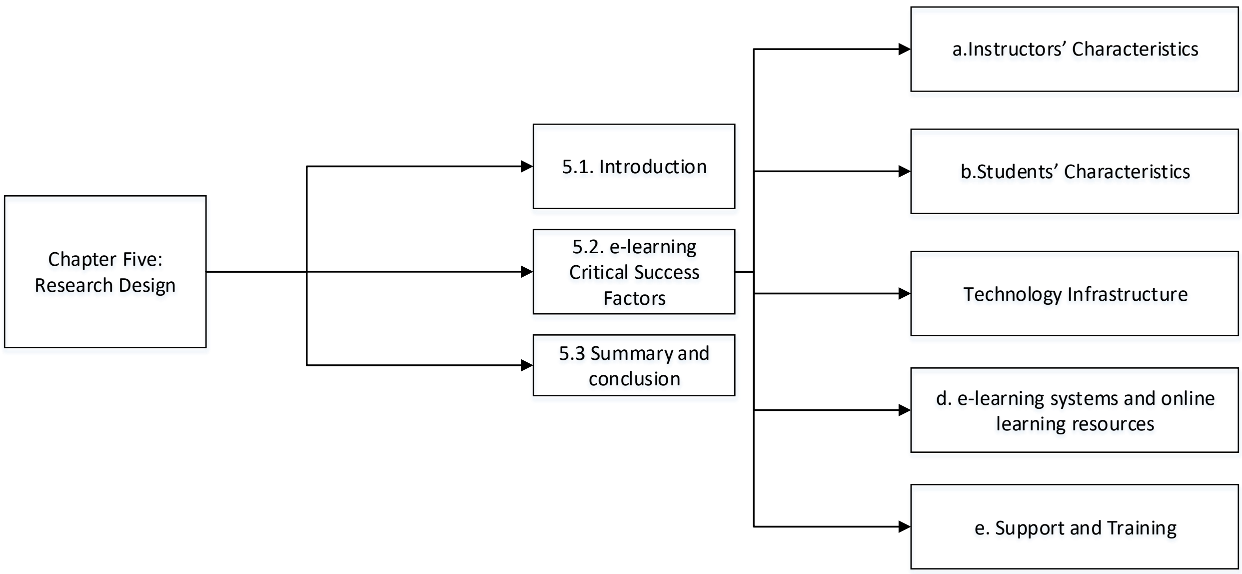

Figure 5.1: Chapter sections

5.2 e-learning Critical Success Factors

Since the emergence of the e-learning concept, numerous authors have been attempting to identify the CSFs for e-learning projects around the globe. Reviewing the literature has shown that there is no agreed scope, approach, or focus between these studies. The differences between these studies can be summarised in four points. First, the perspective they focus on. In this regard, it can be noticed that within academic institutions, three main perspectives have been studied by researchers and they are the experts' management's, the staff', and the students'. While some of the researcher have focused their studies on singular perspective (i.e. experts', the staff', and the students') (e.g. Selim, 2007a), others have decided to conduct some comparative studies between more than one perspective (e.g. students' vs. staff') (Menchacaa and Bekeleb, 2008). One of the main contributions of this research study is that it considers all the three perspectives and it compares their stand on e-learning CSFs.

The second point which these studies differ in is the scope of the study. As it will be explained shortly, e-learning CSFs cover different categories of factors that concern the human, technological, and management sides of the system. While the majority of the studies found in the literature attempted to identify all these categories, some of these studies have focused on a single or couple of dimensions only (e.g. Technological, Human, etc.).

The third point of difference which was clearly noticeable between the different studies is how they categorise e-learning CSFs. Different categorisation of e-learning CSFs were found in the literature. The shortest and most basic categorisation of e-learning CSFs was proposed by authors such as Volery and Lord (2000) and it contains three main categories and they are: students' characteristics, instructors' characteristics, and technology related factors. These three categories have been listed by the majority of the studies with some additional categories. For example, Selim (2007a) and Soong et al. (2001) have added a fourth category concerning institutional support and collaboration factors to the three basic categories suggested by Volery and Lord (2000). Frimpon, (2012) also uses a similar categorization to that of Selim (2007a) and Soong et al. (2001), however, the names used are slightly different as he calls his four categories as student role, faculty role, technology role, and institution role. Malik, (2010) proposes a five categories list; he maintains the students, the instructors, and the technical categories; nevertheless, he removes the institution role or supports and adds design and course categories. Other studies, (e.g. Sun et al., 2008) have expanded the categories even further by proposing six different categories and they focus on students' dimension, instructors' dimension, course dimension, technology dimension, design dimension and finally environment dimension. The longest list of e-learning CSFs categories that could be identified in the literature is the one proposed by Mosakhani and Jamporazmey (2010) who proposed seven different categories and they focus on instructor characteristics, student characteristics, content quality, information technology quality, participant interaction, educational institutes' support and knowledge management.

The fourth point of difference between the found studies are the number of factors they identify within each category; thus, even two studies agree on including a certain category, that does not main that both studies will have the exact number and names of factors in that category. Therefore, different studies identify different numbers of factors. In the following subsections, a set of tables will show which factors are identified by which article or authors.

In this research, five categories are proposed and they are believed to contain the most important and echoed factors in the literature. The five categories are instructor characteristics, students' characteristics, technology Infrastructure, e-learning systems and Online learning resources, and support and training categories. The following subsections shed a light on each of these categories and explain the e-learning CSFs identified within each category.

5.2.1 Instructors' Characteristics

As it was shown earlier, instructors' characteristics category has been listed in vast majority of the studies that identified e-learning CSFs. This shows how important this category is. This emphasis on listing this category in the literature reflect how the qualities and skills an instructor should enjoy impact the success or failure of an e-learning system. Collis (1995) emphasises this meaning when he states that "it is not the technology but the instructional implementation of the technology that determines the effects on learning.".

The literature shows several characteristics an instructor should have in order to support the success of an e-learning system. In this research, seven of these characteristics were chosen as the most echoed in the literature and they are (1) Instructor's ability to motivate students to get engaged in online discussions which focuses on importance of communications between the students themselves and the students with their instructors and the need that the students to be motivated to get engaged in these communications. This in comparison with traditional education in physical classrooms where are involved parties are present and communication occur naturally (Selim, 2007a). (2) Instructor's enthusiasm while teaching using e-learning tools. This characteristic also falls under how the instructor can motivate and enable the students' acceptance of the e-learning system and therefore its success. The instructor should show a positive attitude and energy while using the e-learning system tools to support the students' acceptance and engagement using these tools (Chen et al., 2009). (3) Instructor's ability to motivate the students to use the e-learning system which is in a way similar to the previous characteristic and it focuses on the importance of the teachers' explicit motivation to use of the tools and resources made available via the e-learning system. To enhance the students' learning skills through practical experiences in the e-learning system, students must be motivated and committed by themselves or by the instructions from teachers (Wands and Blanc, 2001). (4) The clarity of instructor's explanation of the e-learning components. To be able to effectively use any e-learning tools or resources, students should understand them; this relies on the instructors' ability to provide clear explanation and description of the different parts of the system to the students (Menchaca and Bekele, 2008). (5) Instructor's ability to use the e-learning system effectively. The instructor himself should be able to use the e-learning system in a fashion that allows best knowledge delivery and best system explanation to the students. Moreover, depending on technology as mean medium for learning, might also result in many technical and access problems for the students; the instructors should master these technologies to aid the students overcome these technical issues, especially if the educational institute technical support is not available (Haynes et al., 1997; Bhuasiri et al, 2009). (6) Instructor's style of teaching using e-learning technologies. In contrast with traditional learning, in an e-learning based environment, the instructor is a facilitator of learning rather than a controller of the learning process.

In the e-learning environment, the instructor should promote self-learning and creativity through engaging them in online discussions (Puri, 2012; Selim, 2007). (7) Instructor's friendliness in general and while teaching. The relationship between the instructors and their students is a built on equality rather than authority. A positive relationship between the two sides plays an essential role in the success of any learning process and that includes learning through an e-learning system. (Selim,2007)

These then are the main characteristics that were found to be important in the instructors' characteristics category. The following table give some example of the articles which these characteristics were found in the literature.

Table 5.1: Instructor characteristics

Categories	Factors \ Sources	Selim (2007)	Menchaca and Bekele, 2008)	Bhuasiri. (2009)	Mosakhani, (2010)	Musa and Othman (2012)	Puri (2012)	Ahmed (2013)	Taha (2014)	Abdel-Gawad (2015)
	Sample type	S	S and A	A and E	S	S	S	A	S and A	S and A
	Country	UAE	USA	Developing countries	Iran	Malaysia	India	Egypt	Bahrain	Egypt
Instructor characteristics	I1. Instructor enthusiasm while teaching using eLearning tools	√			√	√		√	√	√
	I2. Instructor ability to motivate the students to use the eLearning system	√	√		√			√		
	I3. Instructor clarity of explanation of the eLearning components	√					√			
	I4. Instructor ability to use the eLearning system effectively	√	√	√	√		√	√	√	
	I5. Instructor style of teaching using eLearning technologies	√							√	
	I6. Instructor friendliness in general and while teaching	√		√			√	√		
	I7. Instructor ability to motivate students to get engaged in online discussions	√	√	√		√	√			

Key:
S: Students
A:Academic Staff
E:Experts

5.2.2 Students' Characteristics

This category of factors might be the most important and most studied category amongst the rest of e-learning CSFs categories. As a main concept behind e-learning approach to allow more flexible education and facilitate faster communications between students and their teacher despite the geographical barriers, students are core players in this process. Their acceptance or rejection of the e-learning system decides the fate of that system (Masoumi, 2006).

The main focus of this category is to study the students' characteristics which influence the e-learning project acceptance and usage by these students. Many of the found research studies have either fully (e.g. Masrom et al., 2008) or partially (e.g. Volery and Lord, 2000) focused on studying these characteristics. Reviewing the literature revealed many student's characteristics which have been studies in the literature, nevertheless, six of these characteristics were chosen and they believed to cover the main concepts in the literature concerning students' characteristics which influence e-learning system success. These characteristics are (1) Students' willingness to participate in e-learning. While students' willingness to participate in any learning process is essential to any learning process, it even more important when it comes to e-learning based education. This mainly because e-learning relies largely on the students' initiative to learn using the available resources, with the support and facilitation offered by the instructor (Musa and Othman, 2012). Lack of this characteristics can lead to lack of usage of the system and therefore its failure. (2) The student's learning style affecting the use of e-learning. An e-learning system can offer the same learning materials in different formats (e.g. audio, video, text). The suitability of these format to meet the students learning style is an important for the success of the e-learning system; thus, if the learning style of this student does not match the offered material format, this can negatively affect their acceptance of the system (Puri, 2012). (3) The student's ability to find things in e-learning system. This characteristic concerns students' understanding of the system, the instructor explanation clarity, the availability of resources on the system, and the student's willingness to do his or her part of the learning. All these sub factors affect the student's ability to find then learning material and therefore the usability of the system (Musa and Othman 2012). (4) Student's experience and knowledge about computers; this is an essential skill for all the users of the system to obtain in order to use the system. The higher their technology knowledge the better and more effective and efficient they will be able to use and accept the system. Moreover, If the students are comfortable with using the system, their educational gains will be better. Malik (2010) also investigate students' characteristics and reiterate the importance of students' computer efficacy to the success of the system. The lack of suitable computer knowledge can lead to higher anxiety level as claimed by Selim (2007) which can lead to limited benefits to be gained from the whole learning process. (5) The level of student's enjoyment while using technology. Relevant to some other characteristics (IT knowledge, motivations, etc.), being heavily dependent on the students' commitment and willingness to participate and use the e-learning system, being enjoyable to use and keeping the students engaged re essential characteristics of the system. Thus, the higher the joy a student feels while using the e-learning system, the higher chances he or she will accept that system (Taha, 2014). (6) The student's understanding of the purpose of different parts of the e-learning system. This is relevant to the fourth instructors' characteristic which concerns the clarity of explanation as it affects the students' understanding of the system and therefore allow them to use it more effectively and will lead to a higher level of system acceptance and success. The following table restates these characteristics and list a sample of the sources where they were investigated.

Table 5.2: Students' characteristics

Categories	Factors \ Sources	Selim (2007)	Menchaca and Bekele, 2008)	Bhuasiri. (2009)	Mosakhani (2010)	Musa and Othman (2012)	Puri (2012)	Ahmed (2013)	Taha (2014)	Abdel-Gawad (2015)	Malik (2010)
	Sample type	S	S and A	A and E	S	S	S	A	S and A	S and A	S
	Country	UAE	USA	Developing countries	Iran	Malaysia	India	Egypt	Bahrain	Egypt	Pakistan
Students characteristics	S1.Students' willingness to participate in e-learning	√	√	√		√	√	√			√
	S2. The student's learning style affecting the use of e-learning					√		√		√	
	S3. The student's ability to find things in e-learning system.	√				√	√		√	√	
	S4 Student's experience and knowledge about computers	√	√	√		√	√	√			√
	S5. The level of student's enjoyment while using technology	√				√	√	√	√		
	S6. The student's understanding of the purpose of different parts of the e-learning system	√			√	√	√	√		√	√

Key:
S: Students
A:Academic Staff
E:Experts

5.2.3 Technology Infrastructure

Technology is the backbone of an e-learning system. Without technology, e-learning would not exist. Charistie (2003) compares the importance of technology to e-learning with importance of printing houses to conventional learning. Moreover, the utilisation of technology has moved the education approach from instructor-centred (conventional learning) to student-centred (e-learning).

Given that importance, Malik (2010) highly emphasises on the importance of used technology in an e-learning system as it can affect the success of the system in many ways. Malik (2010) argues that Information Technology (IT) is a main enabler of the successful implementation of any e-learning system. Technology Infrastructure has been widely studied in the context of e-learning. Different aspects and factors have been investigated. Out of these, eight factors were chosen to cover this category of e-learning CSFs. These factors are (1) Easy access to internet. This is an important factor especially when the learning is fully delivered over the internet (e.g. distance learning). Availability of internet in general will allow both students and instructors to effectively use all the available sources and course management system. In other words, without easy access to internet, the fast majority of e-learning systems will not be able to operate (Masrom, 2008). (2) Browsing is easy. In this sense, usability of the e-learning system is a main concern. Designing the e-learning system to allow easy search for resources, easy communications between different parties, and many other functions will help the users to accept the system. According to Zewayed et al. (2011), one of the main factors that users rely on to accept or reject the system is how they perceive the ease of use of the used technologies in general. The less required computer and technical skills the more likely the system will be accepted and adopted by these users. (3) Availability of online communication tools. One of the most important aspects of e-learning systems is the communications between the students and their instructors and among the students themselves. This has been also emphasised in the instructor's characteristics category. The system should allow enough and suitable forms of communications channels between the involved parties (Selim, 2007). Examples of these communication channels could be emails, live chats and forums. The availability of these tools will allow better learning materials delivery and will build a relationship between these parties which will eventually help building a friendly relationship between them. According to Pituch and Lee (2006), the better and more efficient the communication facilities in the system, the more acceptable and usable the e-learning system is. (4) Internet speed. This characteristic, in a way, is relevant to first characteristic which is the availability of internet access. While it is true that availability of internet is important, it is also important that such internet is of a suitable speed to allow the full potential usage of e-learning resources (FitzPatrick, 2012). This is particularly true when learning materials are offered in multimedia formats (audio and video) which require high bandwidth connections to be able to downloads it or stream it. (5) Availability of multimedia tools/technologies. In the previous section, it was mentioned that different students have different learning styles. The availability of multimedia technologies have made designing learning materials more suitable for different students even easier. Khan (2005) for example, argues that using multimedia, represented by simulations in this case, supports the students understanding of the e-learning materials through analysing and changing the constructed models. Similar results were reached by Jethro et al. (2012) who argues that using multimedia can support a higher cognition among students through tailoring the presented learning materials to suit their individual needs. This is particularly true when special cases of students are involved such as students with hearing or vision difficulties. In short, multimedia utilisation is important for the success of the e-learning system as it support a higher level of the system acceptance. (6) Ability to search for learning material using the website. The students' efforts play a vital role in the success of the e-learning system. One of the important tasks that a student performs on regular basis is to search for learning materials. This could be as part of the learning process or as a part of the collaborative learning with their instructors or their peers. Having that facility available and efficient is very important for the students to feel that the system is usable for their tasks and therefore for their acceptance of the whole system (Dargham et al., 2012). (7) Availability of sufficient computer labs. Some e-learning systems (e.g. Hybrid systems), do not rely fully on distance learning; students still come to the actual campus and do some of their work. In these systems, as part of their infrastructure, it is vital that there are enough computer stations that can be used by both instructors and their students to do their work. Lack of these computer station can negatively affect the student's perception of the whole system (Masrom, 2008). (8) Reliable technical infrastructure. This factor summarises all the previous factors and focuses on the general concept of technology infrastructure and how important it is to the acceptance of the e-learning. This include, in addition to the previous factors, reliable networks, reliability of other hardware technologies used in the e-learning process, and many other components of the e-learning environment. Broadly speaking, it is accepted in the literature that quality of the used technology and its perceived effectiveness can largely affect the image of the e-learning system in the eyes of its users (Selim, 2007; Friedrich and Hron, 2010). This is particularly true when the system is a hybrid e-learning system where part of the user's tasks relies on the technologies used in the campus and not their personal technologies (Ahmed, 2010). The following table summarises these factors and specifies some of the sources where they have been investigated.

Categories	Factors / Sources	Selim (2007)	Masrom (2008)	Menchaca and Bekele, 2008)	Bhuasiri. (2009)	Mosakhani (2010)	Musa (2012)	FitzPatrick (2012)	Puri (2012)	Ahmed (2013)	Taha (2014)
	Sample type	S	S	S and A	A and E	S	S	S,A and E	S	A	S and A
	Country	UAE		USA	Developing countries	Iran	Malaysia	Thailand	India	Egypt	Bahrain
Technology Infrastructure	T1. Easy access to internet	√	√		√	√	√	√		√	
	T2. Browsing is easy	√	√	√	√		√		√		
	T3. Availability of online communication tools (e.g.-mail)	√	√	√	√			√		√	
	T4. Internet speed	√	√				√	√	√		
	T5. Availability of multimedia tools/technologies			√		√			√	√	
	T6. Ability to search for learning material using the website.	√					√	√			
	T7. Availability of sufficient computer	√	√		√		√			√	
	T8. Reliable technical infrastructure	√	√		√	√	√	√	√	√	√

Table 5.3: Technology Infrastructure items

Key:
S: Students
A:Academic Staff
E:Experts

5.2.4 e-learning Systems and Online Learning Resources

In addition to the previous three categories of e-learning critical success factors, the way the system is designed and the scope of the assistance a user receives from the system while using it is of a vital importance in the determination of that user's decision to accept or rejects that systems. The fourth category focuses on this dimension. Some authors list part of these categories under knowledge Management system (KMS) and they claim that the KMS is the core component of any e-learning system and it is responsible for most of the functions an e-learning system performs such as examination, learning materials delivery, facilitating communications, etc. other authors(e.g. Al-Ammary and Hamad, 2010) investigates some of the factors of this category under the contents category which focuses on how accurate, designed, and delivered the learning materials are. The results of these studies and others (e.g. Hassanzadeh et al., 2012; Sun et al., 2008) show that there is a direct relation between the higher contents quality and higher rates of reusing the e-learning system and therefore, higher levels of adopting the e-learning system as a main style of learning approach among students. Under this category, 13 different factors were selected to represent the factors that have been discussed by other researchers and authors in the literature. These factors are (1) Ease of registration on e-learning course. As the title of this factor states, the amount of difficulty or ease the students face when they want to enrol in an e-learning based course determines their satisfaction with the system as a whole. Enrolling in a course should be as easy as possible (Selim, 2007). (2) Access to the e-learning resources on and off campus. The second factor focuses on the availability of the e-learning system and its resources beyond the geographical scope of the educational institution. This factor is particularly important when the e-learning system is full web-based mode; thus, students do not attend the university and there is no face to face communications between the students and their teacher. Making sure that the students can access the e-learning system and all its resources at which ever geographical location is important (Taha, 2014; Selim, 2007; Musa and Othman, 2012). (3) The layout and design of information. Related to ease of registration and to other factors which will be discussed next, the way the system is designed, the colours, themes, and general appearance of the e-learning system also plays an important role in users' acceptance and adoption of that system (Selim, 2007; FitzPatrick, 2012; and Koseler, 2009). (4) Ease of learning material preparation. This factor focuses on one group of e-learning system users which is the instructors group. Similar to the concept of ease of enrolling in an e-learning course factor discussed earlier, this factor focuses on the ease or difficulty instructors face when they want to add more learning materials to an online course. The easier that process is, the higher the potentials that these instructors will be satisfied with the system and therefore adopting it. (5) Language Support. The fifth factor focuses on situation where additional languages are used by students and instructors. Offering additional languages support could make the e-learning system and its resources more likely to be used by certain groups of users which will aid their satisfaction with the system. Language support as an e-learning CSF has been investigated by (Puri, 2012) and (FitzPatrick, 2012). (6) Sufficiency of the learning materials. The sevenths factor in this category could be argued to be important for both traditional and e-learning based education. Having enough learning materials is a core concept to achieve the desired learning outcomes (FitzPatrick, 2012). (7) Course interactivity. This is one of the most echoed factors in the literature and it focuses on how interactive the online course is. The higher interactivity is related to a higher engagement and joy experienced by students and therefore the higher satisfaction with and adoption of the e-learning system (Menchaca and Bekele, 2008; Mosakhani and Jamporazmey, 2010). (8) Availability of communications with the instructor in the e-learning system. Communications between the different groups of users has been discussed widely in the literature. It has also been discussed in the instructors and students' characteristics categories. For these factors to exists, the e-learning system itself should make enough and suitable communication tools available to be used by the users (Selim, 2007). (9) Availability of online test/quizzes. In an e-learning environment, traditional examination process is not always possible. This is especially true in full web based e-learning mode. The system should allow suitable facilitates where students can be examined online (Puri, 2012). (10) Option to return to unfinished tasks. The tenth factor is in line with the nature of e-learning system usage. As there are no specific class time (in some cases), the students use the system on their pace, the system should be flexible to allow the students (and other users) to save tasks and return to them when it is suitable. (11) Measurement of learning progress. Through examination and other tasks, the system should provide suitable tools and facilitates to allow the instructors and the students to measure the learning progress. This factor is important in an e-learning environment with the physical attendance is not always an option therefore, personal communication which the instructor can use to measure the students' progress is not possible (Puri, 2012). (12) Whether the learning material is up-to-date. Finally, a factor that is important for both conventional and e-learning based education is the updatability of the learning materials. Updated contents has been proved to be important by researchers such as Olugbara and Ojo (2013) and Mosakhani and Jamporasmey (2010). The following table (5.4) shows these factors, some of the literature sources where they were investigated.

Table 5.4: e-learning systems and online learning resources

Categories	Factors \ Sources	Selim (2007)	Menchaca and Bekele (2008)	Bhuasiri. (2009)	Mosakhani (2010)	Musa (2012)	FitzPatrick (2012)	Puri (2012)	Ahmed (2013)	Taha (2014)	Abdel-Gawad (2015)
	Sample type	S	S	A and E	S	S	S,A and E	S	A	S and A	S
	Country	UAE	USA	Developing countries	Iran	Malaysia	Thailand	India	Egypt	Bahrain	Egypt
e-learning systems and Online learning resources	E1. Ease of registration on e-learning course.	√	√			√			√		
	E2. Access to the e-learning resources on and off campus	√				√			√	√	
	E3. The layout and design of information	√	√		√	√	√	√		√	
	E4. Ease of learning material preparation.	√									
	E5. Language Support	√		√			√	√	√		√
	E6. Sufficiency of the learning materials.	√		√	√				√	√	
	E7. Course interactivity.	√	√		√	√	√	√			
	E8. Availability of communications with the instructor in the e-learning system.	√	√			√	√		√		
	E9. Availability of online test/quizzes.							√	√		
	E10. Option to return to unfinished tasks.								√		
	E11. Measurement of learning progress.	√			√		√		√		
	E12. Whether the learning material is up-to-date.				√		√			√	

Key:
S: Students
A:Academic Staff
E:Experts

5.2.5 Support and Training

Moving from the conventional style of learning (i.e. face-to-face) to more of technology based education (i.e. e-learning) put an extra cognitive load and challenges on both the students and the academic staff (Mcpherson and Nunes, 2006). Therefore, when deciding to adopt a new e-learning project, it is essential for the project managers to carefully consider the support needs that these e-learning system users might need in order to achieve the success of such a system (Salmeron, 2009). The availability of university support has been indicated as a CSF for both e-learning (Salmeron, 2009) and conventional learning (Selim, 2007). Furthermore, the availability of support can affect the users' acceptance and their rating of the e-learning environment (Masrom et al., 2008).

Support and training factors have been studied by many authors such as Selim (2007), Frimpon (2012), and Abdel-Gawad and Woollard (2015). Five factors have been chosen in this category and they are (1) Availability of offline technical support; thus, users should be able to communicate with support team and help desk in person when it is possible. Availability of technical support has been emphasised by several researchers such as Fripmon (2012) and Olugbara and Ojo (2013). (2) Friendliness of support team. The second factor falls under the relationship between the users and the management of the e-learning system. Away from the technical aspects of the e-learning system and similar to the relationship between students and instructors discussed earlier in the instructor's characteristics section, a friendly relationship should develop between the support team and the different groups of users. This should help the user to develop a higher acceptance of the system in general. This factor applies on both online and offline support provided by the support team (Menchaca and Bekele, 2008). (3) Availability of online help desk. The easiest and most straightforward way to help the student solving any technical problems they face is to make a help desk available (Bacsich, Bastiaens and Bristow, 2009). This help desk does not have to be an actual physical desk, it could be a paper manual that instruct the student on how to use the system or how to trouble shoot or an online manual that does the same function. The possibility of direct assistance through both offline and online technical support teams is always an option to make available (Puri, 2012). In an e-learning environment, students and staff will rely more on online assistance from the support team. Live chats, email communications, and discussion forums are all different forms of online help desk that should be provided to the users. (4)

Availability of training. This type of support focuses on upgrading the e-learning system competent ices to become more efficient in using the e-learning system resources (Taha, 2014; Puri, 2012; Alhomod and Shafi, 2013). Moreover, such training should aid the e-learning system users to have a better relationship with technology in general and be more interactive with it (Bacsich, Bastiaens and Bristow, 2009). Such enhancements of the users' technological skills should improve their acceptance for the system and their motivation levels to use it (Cruz, 2010). (5) Availability of on campus printing facilities. Essential to the services provided by an e-learning is to make printing services available to the students especially with the reduction or elimination of physical classrooms environment where instructor can provided printed learning materials to the students. The following table summarizes these support related factors and the literature sources they are cited from.

Categories	**Sources** / **Factors**	Selim (2007)	Masrom (2008)	Menchaca and Bekele (2008)	Mosakhani (2010)	FitzPatrick (2012)	Puri (2012)	Ahmed (2013)	Taha (2014)	Abdel-Gawad (2015)
	Sample type	S	S	E and S	E	S, A and E	S	S	S and A	S andA
	Country	UAE	USA	USA	Iran	Thailand	India	Egypt	Bahrain	Egypt
Support and training	ST1. Availability of offline technical support	√	√	√		√	√	√	√	√
	ST2. Friendliness of support team	√	√	√	√		√			
	ST3. Availability of online help desk			√				√		
	ST4. Availability of training		√	√		√	√	√	√	
	ST5. Availability of on campus printing facilities	√	√					√		

Table 5.5: Support and training items

Key:
S: Students
A:Academic Staff
E:Experts

5.3 Summary and Conclusion

This chapter built upon the outcomes of the previous chapter by introducing five categories which are believed by the researcher to be the most iterated and important in the relevant literature. The next chapter uses some of the outcomes of this chapter to collect data from experts in the field of e-learning in Saudi Arabia.

CHAPTER SIX: PRELIMINARY STUDY

6.1 Introduction

Having introduced the Saudi context in the Chapter Three, suggested a set of research methods in Chapter Four, and investigated the relevant literature in Chapter Five, this attempts to get closer to that context by conducting an initial investigation of e-learning CSFs through asking experts about the factors, which they believe to be important in the Saudi context. The aim of this chapter is to have a closer look at the e-learning system in Saudi Arabia and the factors, which have been considered by these experts and therefore the decision makers. To fulfil this aim, section 6.2 argues for the research methods, which will be adopted in this initial investigation. In Particular, the section argues for using interviews as an instrument to collect data from the experts. The section also presents the sample used to collect data from. Section 6.3 Provide an initial list of e-learning CSFs categories, which the questions of the interviews will be focused on. That list is developed based on reviewing the relevant literature. Section 6.4 focuses on presenting the interviewing process while section 6.5 and 6.6 focus on presenting the data analysis process and its results respectively.

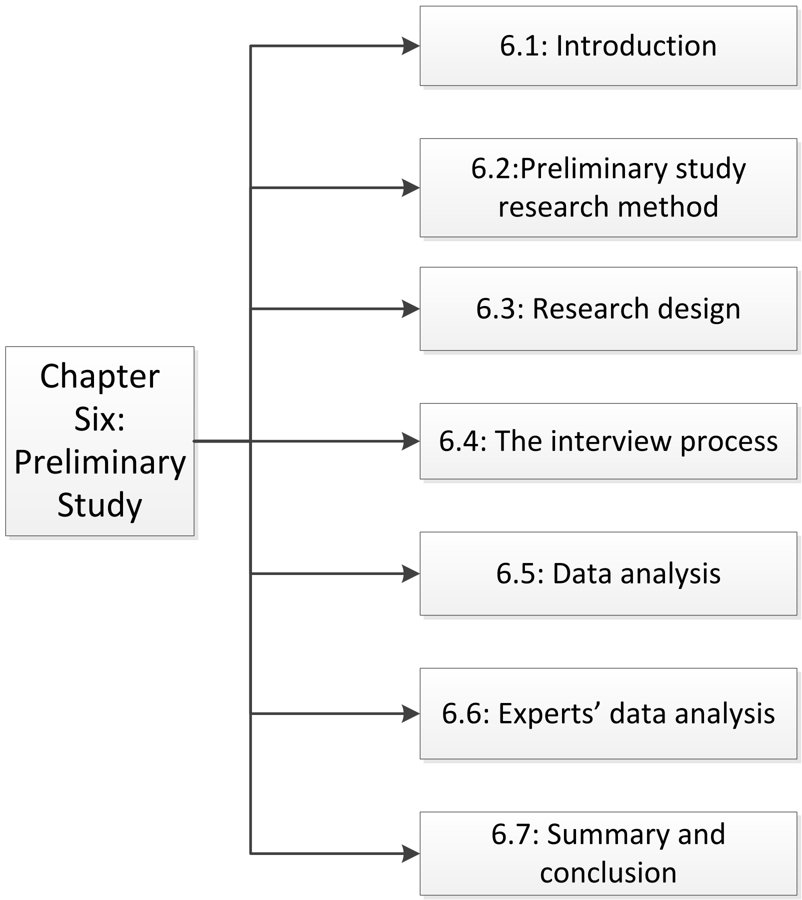

Figure 6.1: Chapter Sections

6.2 e-learning Preliminary Study Research Methods

The first stage aimed at exploring the current status of e-learning systems and the important factors that affect their success from their management's point of view. To achieve this aim, this stage adopted a qualitative research methodology. More specifically, a case study approach was adopted to study these systems in three different Saudi universities. To collect data from the management members, interviews were chosen as a data collection instrument. Interviews, as argued in the research methods literature part of this chapter, are suitable to gain a wider and deeper understanding of the participants' experiences with the research problem.

While preparing any data instrument, the researcher is always motivated to choose the type of questions and the language to phrase these questions in a way that motivated the respondents to give as much information and knowledge as they can (Yin, 2003). Many advantages have been iterated in the literature for interviews as a data collection instrument and for the process of preparing the interviews and listing the potential questions to be asked to the participants. For example, to prepare the interviews, the researcher has to review the relevant literature concerning the interview topic. Through this review, the researcher's knowledge about the research problem grows immensely. Furthermore, interviews allow more self-expression and better communication for both the interviewer and the interviewee (Kahn and Cannell, 2004). DiCicco-Bloom and Crabtree (2006) categorise interviews based on question types used into three categories. (a) Structured interviews which are constructed of polar questions or yes-no questions. (b) Semi-structured interviews which rely on a mixture of polar questions and open-ended questions that allow the respondent to freely answer the question. Question types such as like 'why', 'how', and 'what' fall under this category; and (c) unstructured interview which solely rely on open ended questions. Every type of these interviews has its advantages and disadvantages as a data collection instrument. For example, structured interviews allow the researcher to collect straightforward data. Transcribing and analysing data collected from structured interviews is the easiest among the three types. Moreover, structured interviews give the interviewer full control over the progress and the duration of the interview as the interviewee has no control on his or her answers other than saying yes or no. On the other hand, structured interviews permit the shallowest depth of knowledge among the three types due to the restricted answers the interviewee can give during the interview. Semi structured interviews have the advantages of giving some control over the interview to the interviewer while allowing the interviewee to give extended answers for certain questions. Therefore, interview control and depth can be balanced. Unstructured interviews allow the deepest gain of understating of the research problem as the interviewees can express themselves as much as they wish and provide detailed answers. Nevertheless, the interviewer can lose control over the length and the direction of the interview (Creswell, 2007). These are then the interviews advantages and disadvantages. For the investigating e-learning system management point of view, the researcher decided to use semi-structured interview due to balance of depth and control they allow. In term of designing the interviews themselves, the researcher reviewed the relevant literature to check for topics and questions that can give better insights and understanding of e-learning systems and the importance of certain factors more than other on the acceptance and the success of these systems.

Furthermore, case study approach is suitable to adopt when the researcher needs to develop a holistic view of the organisations where the research is taking place. For the purpose of investigating the e-learning Management perspective, three case studies of Saudi universities were chosen. The reasons behind the choice of this number of case studies and the selection of these specific three case studies relied on the responsiveness and cooperation of the contacted Saudi universities; thus, as part of the preparation of the first stage, the researcher prepared a list of potential Saudi universities who he believed to be active in the field of e-learning. Moreover, the list contained the universities that are within the geographical reach for the researcher given the time dedicated for this stage and the researcher's available resources. All the universities in that list have been formally contacted to ask for their cooperation and involvement in the proposed research. Out of the universities in that list who were contacted, three of them have replied with a positive answer to the researcher request. These universities were Kind Saud University, Majmaah University, and Qassim University. These universities were selected because of their high level of commitment to e-Learning initiatives. In addition, extending the study to three universities enabled exploration of any differences in perceptions of critical success factors that might derive from other differences between the three universities. All three of the universities take both male and female students.

University	Number of students	Location	Type of students	Implementing e-learning
Majmaah	24288	Majmaah	Undergraduate and postgraduate	2013
King Saud	63098	Riyadh city	Undergraduate and postgraduate.	2012-2008
Qassim	52000	Qassim city	Undergraduate and postgraduate.	2013

Table 6.1. The participating universities profile

In terms of the actual participants in the data collection process, seven staff members who are believed to be involved in decision making regarding e-learning systems in the involved universities and to have their own research activities in the same field have been selected. The academic positions these participants play in the universities were also carefully selected to reflect current status of the e-learning in these universities. The following table gives some details about the sample of participants.

<table>
<tr><th></th><th>Job role</th><th>University</th><th>experience/yrs</th><th>e-learning projects</th></tr>
<tr><td>1</td><td>Vice dean for academic affairs, Deanship of e-learning</td><td rowspan="3">King Saud University</td><td>5</td><td rowspan="3">1. Digital content improving tools.
2. Learning management system.
3. Virtual classrooms.
6. Educational community system.
5. Training management system.
6. Mobile learning.
7. SMS services.
8. Reporting System.</td></tr>
<tr><td>2</td><td>Head of the e-learning Program, Information Science department.</td><td>9</td></tr>
<tr><td>3</td><td>Director of quality assurance unit, Deanship of e-learning</td><td>10</td></tr>
<tr><td>4</td><td>Vice dean of e-learning</td><td rowspan="2">Majmaah University</td><td>5</td><td rowspan="2">1. implementation Desire2Learn.
2. Television production education.
3. Development of virtual labs.
6. E-content development.
5. Technical support programme development.</td></tr>
<tr><td>5</td><td>Head of computer science department</td><td>4</td></tr>
<tr><td>6</td><td>Vice dean for academic affairs, deanship of e-learning.</td><td rowspan="2">Qassim University</td><td>10</td><td rowspan="2">1. Development of e –courses programme.
2. Learning management system.
3. Training courses for faculty members.
6. Mobile learning.
5. Virtual classrooms.
6. The use of podcasts in education.
7. Technical support programme development.</td></tr>
<tr><td>7</td><td>Head of computer science department.</td><td>6</td></tr>
</table>

Table 6.2. Experts respondents profiles

6.3 Research Design

At this point, the researcher has chosen to use semi-structured interviews to collect data from e-learning system management in the 3 selected universities as presented above. The next step is to actually design these interviews. In order to achieve this goal, the researcher conducted a literature review which focused on checking what similar studies in other contexts have focused on and what e-learning CSFs factors they have considered when they investigated the perspectives of different e-learning systems users and managers groups.

Article	Selim (2007)	Menchacaa and Bekele (2008)	Mosakhani and Jamporazmey (2010)	Hassanzadeh, Kanaani, And Elahi (2012)	Bhuasiri et al. (2012)	Caporarello And Sarchioni (2014)	Abdel-Gawad and Woollard (2015)
Sample members	Students	Students/Lecturers	Students	e-learning experts	experts/Lecturers	Students	students/lecturers
Country	UAE	USA	Iran	Iran	Thailand	Italy	Egypt.
Factors category							
Instructors' Characteristics	x	x	x	x	x		x
Students' Characteristics	x	x	x	x	x	x	x
Information Technology	x	x	x	x	x	x	x
Support	x		x		x	x	x
Technology Knowledge			x		x	x	x
Course		x		x	x	x	
Instructional Design		x	x	x			x
e-learning Environment					x		x
Level of Collaboration			x		x	x	x
Knowledge Management			x		x		

Table 6.3. e-learning CSFs factors

The above listed factors in table 6.3 are not necessarily comprehensive. More factors can be found in the literature. Nevertheless, these factors are believed to be a good representative sample of the literature concerning the e-learning CSFs. It is important to notice that the listed categories above are titles for more detailed factors. Thus, under students' characteristics, there are several factors which cover aspects of the students' demographic and educational characteristics. Also, as shown in the table, the authors differ in number of categories they classify these factors in. While some of the authors divide e-learning CSFs into as little as four different categories (e.g. Selim, 2007; Chen, Liao, and Chen, 2009), other authors expand this list to include as many as ten different categories (e.g. Hassanzadeh, Kanaani, and Elahi, 2012)

Based on the literature review, the repetition of the different categories and the specific factors within them, the researcher has developed a five categories list of e-learning CSFs and it includes students' characteristics, instructors' characteristics, learning environment, instructional design factors and support related. While the names of these categories appear similar to those in Table 1, some of these categories include factors from more than one category in Table 1 while other are a result of merging more than one category from that table.

In this chapter, this list of e-learning CSFs will be adopted to guarantee as comprehensive coverage as possible of all possible factors. The following subsections present five categories classification of e-learning systems which is believed to cover all the suggested e-learning CSFs in the literature.

6.3.1 Students' Characteristics

This category of factors might be the most important and most studied category amongst the rest of e-learning CSFs categories as it appears in Table 1. All the summarised research papers have listed this category. The main focus of this category is to investigate the students' characteristics which influence the e-learning project acceptance usage by these students. Some of the students' important characteristics in category include students' pace of learning, their level of commitment to and attitude towards e-learning, and their level of motivation (Salmeron, 2009; Masrom et al., 2008; Leidner and Jarvenpaa, 1993). Other students' characteristics which can impact their usage of an e-learning system are their previous knowledge with computer systems in general, their demographic characteristics (gender, age, level of academic programme, etc.) (Colley et al., 1994).

To enhance the students' learning skills through practical experiences in the e-learning system, students must be motivated and committed by themselves or by the instructions from teachers (Blanc and Wands, 2001). In addition, students will learn better if they are motivated to learn in the first place (Pawlowski, 2002). Moreover, the reinforcement will create awareness; for example, the rewards from a student's efforts make that student want to repeat the behaviour. Transmission is dependent on the performance of students with new learning skills that can be applied directly in the workplace (Blanc and Wands, 2001). Instructor' feedback should be made available in the forms of immediate and adequate after students have attempted on online interaction (Blanc and Wands, 2001; Pawlowski, 2002; Selim, 2007; Schreurs et al., 2009). Moreover, the students' attitude to IT has been largely emphasised in several studies. If the students are comfortable with the Learning Management System (LMS) (explained later in this report), their educational gains will be better. Online assignments could also motivate students. Finally, multimedia has been included in LMSs in the last years, which could provide additional motivation for students (Salmeron, 2009). To summarise, the students' characteristics which will be considered for further investigation in Saudi Arabia context are Students' pace of learning, Level of commitment, Attitude towards e-learning, Level of motivation, Knowledge with computer systems, and their Demographic characteristics (Gender, academic programme, etc.)

6.3.2 Instructors' Characteristics

The instructors' characteristics have been mentioned as much as students' characteristics (see table 1). Some authors, nevertheless, have merged both students and instructors' characterises under a broader human factors category. There many qualities that an instructor should enjoy so he or she can contribute to the success and acceptance on an e-learning system. Amongst these qualities are his or her attitude towards students, their teaching styles, their attitude towards and skills to use the available technologies, and their ability to motivate the students in general and to learn using an e-learning system in specific. Collis (1995) states that "it is not the technology but the instructional implementation of the technology that determines the effects on learning."

Webster and Hackley (1997) argue that the instructors' positive attitude promote the use of technology and advocate distributed learning can also positively the students' learning gains using these technologies. Furthermore, to overcome the feeling of isolation that the students might face as a result of heavily depending on technology in learning rather than a traditional class room environment, the instructors' can replace that by making their office hours more flexible to cover the students' needs. Depending on technology as mean medium for learning, might also result in many technical and access problems for the students; the instructors should master these technologies to aid the students overcome these technical issues, especially if the educational institute technical support is not available (Haynes et al., 1997).

To summarise, instructors' characteristics which will be considered are positive attitude, office hours more flexible, knowledge with learning technologies, teaching styles, and ability to motivate the students.

6.3.3 Learning Environment

Just like in a conventional learning environment, there are some aspects of the e-learning environment which utilise much better learning. According to Blanc and Wands, 2001, people tend to learn better in a learning environment that is casual, they trust, and they feel conformable while using. Many authors have described certain aspects of the e-learning environment that are believed to have impacts on the learning outcome of the students. These aspects can be summarised as follows:

- Learning Management System(LMS)

Learning Management System (LMS), which is also known as Knowledge Management System (KMS) in some studies, is the core of an e-learning environment (Huddlestone and Pike, 2008). Amongst the functionalities LMS system should offer for students is to allow the delivery of electronic contents of the courses, tracking of the e-learning processes, carrying out electronic exams, etc. For instructors, LMS should provide a set of tools that allow them an easy design and creation of electronic learning materials, teaching, marking, etc. (Selim, 2005; 207; Chantanarungpak, 2011). Two reasons make LMS important for e-learning system success; (a) its usability which will affect the overall users' acceptance of the system and (b) its costs which will affect the system owner's decision to adopt a certain LMS or even an e-learning all together (Lee and Owens, 2002).

- Technical Infrastructure

There are several ways in which technology affect the success of the e-learning system. For example, the appropriateness of knowledge transfer approach used in the e-learning environment (Masrom, Zainon and Rahiman, 2008). Moreover, Selim (2005) argues that the used technology should be reliable and capable to provide easy and smooth access throughout the learning process as this is a critical factor which can either encourage the students to use the system more frequently or just puts them of it.

- Interactive Learning

Interactivity with students also is an important technological feature which impacts the students' acceptance of an e-learning system. On this, McIntyre and Wolff (1998, p. 257) state that "one of the powers of interactivity in a Web environment is the capability to engage by providing rapid, compelling interaction and feedback to students." According to Moore and Kearsley (2005) there are three types of interactions in an e-learning environment; (a) students-learning material interactions, (2) students-instructor interactions, and (3) student-student interactions. All these types of interaction can either positively or negatively affect the levels of all users' satisfaction with the e-learning system (Selim, 2005).

- Access and Navigation

In this sense, access refers to the existence of a clear policy that sets the authorisations and rules that follows the overall educational institutions polices. Navigation refers to the visual structure of the e-learning system which allows the users to easily move from one part of the e-learning system to the other (Allen andSeaman,2005; PennState,2008). These features in addition to improving the overall educational gains among students, they also play a role in the acceptance of the system by these students and by other users.

To summarise, each of the above discussed aspects will be considered as a separate e-learning CSFs in this report.

6.3.4 Instructional Design

In addition to the features which distinguish an e-learning environment from a conventional learning environment, there are some mutual CSFs between these two types of environment. The instructional design category focuses on these CSFs. Some of these CSFs include.

- Clarification of Objectives

Any learning environment aims at enhancing the learners' knowledge about the subject being taught. Therefore, a mutual CSF between conventional and e-learning environment is the clarity in the learning objectives.

- Content Quality

This CSF is concerned about the characteristics of the learning material the e-learning environment offers. These materials should be clear, accurate, complete, consistent, relevant, and suitable for the students' skills levels (Selim,2005; MosakhaniandJamporazmey,2010). Uniquely from conventional learning environment, the quality of e-learning environment materials can be enhanced through the incorporation of multimedia formats (Bhuasiri,2012).

- Learning Strategies

Educational environment relies on different learning and teaching strategies to achieve the planned goals of the learning process. Considering the uniqueness of e-learning process, the followed learning strategies should be tailored to suit such uniqueness. For example, the student's independent learning which requires more support from the instructor and the system itself (Bacsich, Bastiaens and Bristow,2009).

- Psychology of Learning

In an e-learning environment, motivation can come from both the instructors' and the system itself (Pawlowski,2002; Bacsich, Bastiaens and Bristow,2009). Continuous feedback from the instructor through the system or face-to-face in case of blended learning can help. The system itself should be designed to motivate the students (Blanc and Wands, 2001).

- Learning Assessment

To measure the effectiveness of an e-learning environment, it is essential that the educational institution carry out some evaluation studies to measure the gained benefits by the students after finishing their electronic course. This will aid the institution to better develop their approaches, courses, and learning materials (Harasim,2003). It is important, nonetheless, that the institution relies on valid and reliable types of evaluation techniques (students' tests, assignments, etc.) to measure the students' progress in the taught courses (Chantanarungpak, 2010; Blanc and Wands, 2001).

6.3.5 Support Related Factors

Moving from the conventional style of learning (i.e. face-to-face) to more of technology based education (i.e. e-learning) put an extra cognitive load and challenges on both the students and the academic staff (Mcpherson and Nunes, 2006). Therefore, when deciding to adopt a new e-learning project, it is essential for the project managers to carefully consider the support needs that these e-learning system users might need in order to achieve the success of such a system (Salmeron, 2009). The availability of university support has been indicated as a CSF for both e-learning (Salmeron, 2009) and conventional learning (Selim, 2007).

Furthermore, the availability of support can affect the users' acceptance and their rating of the LMS usability (Masrom et al., 2008). According to Cheawjindakarn, Suwannatthachote, and Theeraroungchaisr (2012), there are three categories of the required support:

- Training:

This type of support focuses on upgrading the e-learning system competent ices to become more efficient in using the e-learning system resources (Mosakhani and Jamporazmey, 2010; Puri, 2012). Moreover, such training should aid the e-learning system users to have a better relationship with technology in general and be more interactive with it (Bacsich, Bastiaens and Bristow, 2009). Such enhancements of the users' technological skills should improve their acceptance for the system and their motivation levels to use it (Cruz, 2010).

- Communication Tools:

Communication tools, in specific, are extremely important for the success of an e-learning environment. Asynchronous communications could be used to allow students to work in teams, so that the instructor does not have to respond to each individual posting (Branon and Essex, 2001). On the other hand, synchronous communication tools could be used to meet with smaller groups of students online (Salmeron, 2009). It is argued by authors such as Allen and Seaman (2005) and Bhuasiri et al. (2012) that the availability of these communication facilities will contribute towards achieving the planned learning outcomes.

- Help Desk:

The easiest and most straightforward way to help the student solving any technical problems they face is to make a help desk available (Bacsich, Bastiaens and Bristow, 2009). This help desk doesn't have to be an actual physical desk, it could be a paper manual that instruct the student on how to use the system or how to trouble shoot or an online manual that does the same function. The possibility of direct assistance through both offline and online technical support teams is always an option to make available (Puri, 2012). To summarise, the availability of training, communication tools, and help desk will be considered as a separate e-learning CSF in this research paper.

The following table (6.4) summarises the new adopted categorisation of e-learning CSFs.

#	Factors Category	Factors considered
	Student Characteristics	Students' pace of learning
		Level of commitment
		Attitude towards e-learning
		Level of motivation
		Knowledge with computer systems
		Demographic characteristics (gender, age, academic programme, etc.)
	Instructor characteristics	positive attitude
		office hours more flexible
		Knowledge with learning technologies
		teaching styles
		ability to motivate the students
	Learning Environment	Learning Management System (LMS)
		Technical Infrastructure
		Interactive Learning
		Access and Navigation
	Instructional Design	Clarification of Objectives
		Content Quality
		Learning Strategies
		Psychology of Learning
		Learning Assessment
	Support Related	Communication Tools
		Help Desk
		Training

Table 6.4: the new adopted categorisation of e-learning CSFs

On the basis of the results of literature review and the new adopted five categories of CSFs shown in the above table, the researcher has designed the semi structure interviews to obtain data from the e-learning managers in the selected Saudi universities; thus, first question of the interviews asked the interviewees to put an importance order next to each category. For example, if the interviewee thinks that the Instructor's characteristics are the most important category in terms of its effect on the success of the e-learning system in their institution, then they need to give number 1. The rest of the categories should be given number 2, 3, 4, or 5 depending on their importance according to the interviewee point of view. A similar process was followed for each of the 5 categories; in each category, the interviewees were asked to give an impotence order for the factors in that category. Moreover, for each factor in each category, the interviewees were asked to elaborate on that factor's impact on the success of the e-learning system in their institution. Once ordering the factors within the categories was accomplished, the interviewees were then asked to give justifications for giving a certain factors the highest important and lowest importance.

6.4 The Interview Process

Part of the interviews preparation stage, the researcher asked the potential respondents about the place and time they prefer to hold the interviews. The majority of the respondents asked the interviews to be held at their working places during working hours. However, one respondent preferred to be emailed the interview questions which he later returned them answered.

Before the actual date of the interviews, the researcher double checked the respondents' availability. Moreover, following the relevant literature recommendations, a short profile has been created for each university which included a special code for each university and a special code for each interviewee in that university. On the interview date and before actually conducting the interview, the researcher briefly presented himself and gave an overview of the project. The interviewees were also made aware that their participation in the data collection is voluntarily and therefore, they can decide at any moment of the interview to finish it. Moreover, interviewees' permission to record the interviews was asked and it was explained that the purpose of that recording was for future reference only and their identity will be always be protected from any unauthorised access. The permission to record was granted by some of the respondents while others have rejected to give that permission. For those who have rejected, handwritten notes have replaced the audio recording.

The interviews themselves went through in a smooth manner with no major obstacles. Once, the interviews were conducted, the researcher has engaged the interviewees in an informal chat about the project in general and asked their permission to contact them in the future for further information and questions.

6.5 Data Analysis

To analyse the collected data, a qualitative thematic analysis was followed. According to Braun and Clarke (2006a, p.79), a qualitative thematic analysis is a qualitative analytic method used for 'identifying, analysing and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail. However, frequently it goes further than this, and interprets various aspects of the research topic.'

Braun and Clarke (2006b) state that *"a theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set"*

Moreover, Braun and Clarke (2006b) describe the process of thematic analysis in the following six steps.

Phase 1: familiarizing yourself with your data

The main focus of this phase is for the researcher to get to know the data he or she about to analyse better and deeper. The familiarization process could take different approaches, however, when data collected through interviews or any other verbal means, the data transcription could be the best way for the researcher to develop a deeper understanding of the data.

Phase 2: generating initial codes

Once the researcher is familiar with the data, the next stage is to start generating basic blocks of ideas that seem to be interesting and relevant to the research among the large amount of other irrelevant or less connected to the research questions.

Phase 3: searching for themes

The next step is to start organizing the codes generated in the second stage by attempting to identify seminaries and link them in separate themes. The researchers task is look for ideas that are closely related to form a new theme. The identified themes at this stage are only initial and not final.

Phase 4: reviewing themes

Based on the identified initial themes, the researcher starts to look for his or her final themes to identify. The process involves two iterations. First a review of the ideas identified in the second phase to check whether they actually form a coherent and clear theme; if the researcher is satisfied with the initial ideas and their grouping in the initial theme, then he or she moves to the second iteration which involves checking of the group of themes identified so far actually represent the meanings and ideas presented in the original set of data. If the researcher is unsatisfied with either, a reword of the ideas and themes identification might be required.

Phase 5: defining and naming themes

The fifth step is to give the identified themes names that reflect their story and the ideas connected within them.

Phase 6: producing the report

Once all the work is done and the researcher is happy with his or her analysis, a final report that describes the data set, the analysis process, and some evidence from the data that proves the thematic organization chosen by the researcher; For example, some extracts from interviews.

6.6 Experts Data Analysis

As described in details in the research methods chapter, the data collected from experts and manager were analysed following a qualitative thematic analysis approach. Using this approach, the researcher went through the transcripts of the interviews to find similarities and patterns in the respondents' answers. The researcher was also interested in finding the reasoning behind giving certain levels of importance to certain CSFs. Furthermore, the analysis has followed a holistic approach; thus, the interviewee responses were analyzed in parallel to detect the similarities and differences between responses from expert from the same university and other universities. The following subsections shows the results for analysing the category ranking responses.

6.6.1 Category Rankings

Table 6.1 shows the orders the respondents have given for different categories. The first column represents the respondents while the following five columns represent the five CSFs categories. The bottom row shows the summation of the rankings given by the respondent to a specific category of factors. The smaller the summation of rankings for a certain category, the higher the importance of that category and vice versa.

Interviewee	Student Factors	Instructor's characteristics factors	Learning environment factors	Instructional Design factors	Support related factors
Q1	2	3	1	5	4
Q2	3	2	1	4	5
M1	2	1	4	3	5
M2	1	2	3	4	5
K1	1	2	4	3	5
K2	4	1	2	3	5
K3	1	2	3	5	4
Total	**14**	**13**	**18**	**27**	**33**

Table 6.5: e-learning critical success factors categories rankings (numeric representation)

By examining the bottom row summation, the categories can be order from the most to the least important as follows: Instructor characteristics factors, students character support related factors, instructional design factors, learning environment factors, student factors, and instructor factors. Further examination of the table shows that all of the experts ranked related support factors as the most or second most important category which explain how it became the most important overall category of all of them. Instructional design factors have received a variety of ranking ranging between 3 and 5; nevertheless, all these rankings are still on the higher importance range. Learning environment category received relatively lower rankings than the first two categories. It is noticed that both respondents from Qasim University have given this category the lowest ranking (I.e. 1) while respondents from M university have given it a relatively high ranking. Students characteristics category was ranked as second lowest category of e-learning CSFs and received overall. Instructor characteristics fell in the least position of all and received low ranks by the majority from respondents apart from one respondent who ranked it as the second most important (K2). It can be noticed that the three most important categories of factors have received a higher ranking by the majority of the respondents.

The next phase of the interviews asked the interviewees to rank the individual factors within the categories. The next section shows the results of analysis the data collecting from this part of the interviews.

6.6.2 Ranking CSFs within Categories

The order of analysis started by the most important category down to the least important one. The results are presented in the following 5 subsections.

6.6.2.1 Instructor characteristics

Interviewee	Positive attitude	Office hours more flexible	Knowledge with learning technologies	Teaching styles	Ability to motivate the students
Q1	4	1	2	3	5
Q2	2	4	1	5	3
M1	3	5	1	2	4
M2	4	5	2	1	3
K1	2	5	1	3	4
K2	3	2	1	4	5
K3	4	5	1	2	3
Total	**22**	**27**	**9**	**20**	**27**

Table 6.6: Instructor related e-learning system CSFs (numeric representation)

Following the same approach of analysis used for the categories in the previous section, instructor characteristics data table (Table 6.2) shows that "knowledge with the learning technologies" factor is the overall most important factor within this category. Five out of the 7 respondents have ranked this factor as the most important factor among the given five factors while the other two have ranked it as the second most important factor. Looking at the responses from certain universities, it can be noticed that all three respondents from K University with disagreement have ranked this factor as most important. Respondents from other two universities have either given it the highest or the 2nd highest rank of importance.

In response to the question of why they have ranked "knowledge with the learning technologies" as the most important factor, the answers have varied between different respondents. For example, M2, has recommended that the way to learn more through technology is know how to use technology. He states the following: 'Having deeper knowledge of learning technologies will allow the instructor to search further and deeper for more technologies that he can use in the education processes.

Other respondents have considered "knowledge with the learning technologies" as the cornerstone factor for the success of an e-learning system. Respondent Adel for example stated the following: 'without it (knowledge with the learning technologies), the remaining factors are irrelevant' (M1)

Having total rankings of 20, “Teaching Styles” followed knowledge with the learning technologies and was placed in a second most important place. It was noticed that the ranking have varied for this factor in the sense that some interviewees ranked it as most important (e.g. M2) while others ranked it as least important (e.g. Q2). The rest of the interviewees have given it different ranks between 2 and 6.

In justification for the decision of placing “teaching styles” as a second most important factor, some of the respondents (e.g. K1) have considered it as an important factor for the success of learning processes. He states: ‘Having a variety of teaching style helps the success of the educational process in general and helps the success of the e-learning system as well’ (Mustafa). Q1 agrees with Mustafa on the importance of different teaching styles for the success of learning by stating: ‘The variety of teaching style will enhance the chances for success’.

A close ranking to “teaching style” was given to “Positive Attitude”. It has been emphasised as an important factor for the success of e-learning systems. The majority of the interviewees (4) have ranked “Positive Attitude” as 2nd or 3rd most important factors among instructor characteristics category. The remaining 3 interviewees have ranked it as 4th most important factor.

Both interviewees who gave the positive attitude higher ranks or those who gave it lower ranks have emphasised its importance and impact on both the educational process in general and on effectively using the e-learning system. Some example of their opinions and justifications are as follows:

‘A negative attitude from the instructor can affect the whole educational process even if he is good at his job. It is essential to motivate the instructors to show more positive attitude towards the e-learning system’ (K1)

‘It indicates that the instructor is accepting the e-learning in general’ (M1)

‘The more successful in using the e-learning system, the more positive instructors can become about the system itself’. (Q2)

‘The more positive attitude the instructor has, it will reflect on the attitude and achievement of the students’ (M2).

‘This should help the students to overcome any negative attitude through helping them solving any problems’ (K3)

As these quotations show, despite the rank given to “positive Attitude” of the instructor, it is still agreed between the interviewees that such a factor is important and vital for the successful use of the e-learning system and for designing instructors training schemes.

The least important two factors that are related to the instructor according to these interviews are Both “The flexibility of office hours” and the “Instructor’s ability to motivate the students” were given the same least important ranks by the interviewees. Both of these factors received lower ranks (3, 4, and 5) by the majority of the interviewees apart from 2 interviewees who decided to rank “Office hour flexibility” as 1st and 2nd most important factors in the instructor characteristics category. Examining the interviews transcripts shows that there was a slight disagreement between the interviewees regarding the importance of “Office hour flexibility”. While some interviewees believe it is important to have flexible hours to allow the instructor to learn how to use the e-learning system or parts of it; for example Q1 who stated that ‘The staff should be given flexibility in the time they use LMS so they can master it better’ (Q1). Other interviewees think with having the system available all the time will overcome the issue of having restricted office hours. For example, M1 states that “Availability of the e-learning system all the time should help the instructor to use the system better and more flexible” (M2). And M2 who states that ‘The availability of the system for 24/7 allows the success of the system’ (M1). Despite such disagreement, “Office hour flexibility” was ranked as the least important factor as discussed above.

6.6.2.2 Students' Characteristics

Interviewee	Students' pace of learning	Level of commitment	Attitude towards e-learning	Level of motivation	Knowledge with computer systems	Demographic characteristics
Q1	4	5	3	6	2	1
Q2	2	1	5	4	3	6
M1	4	1	3	5	2	6
M2	2	4	5	1	3	6
K1	4	5	1	2	3	6
K2	5	6	3	4	1	2
K3	6	3	2	5	4	1
Total:	**27**	**25**	**22**	**27**	**18**	**28**

Table 6.7: Students related e-learning CSF (numeric representation)

The second most important category of e-learning CSFs was the students' characteristics. Similar to the instructors' characteristics category, "knowledge with computer systems" factor has been voted by the interviewees as the most important factor with total ranks of 18. Despite being voted as the most important factor, it can be noticed that this factor received 2 times 2nd most important, 3 times 3rd most important, and 1 time 4th most important factor. It was ranked as 1st most important factor by one interviewee only. The main theme for reasons of ranking this factor as the most important was about how essential it is to basically know how to use the e-learning system. For example, K2 argues that 'If the student doesn't have the minimum required level of technological knowledge they can not learn through the e-learning system' (K2). The same argument was stated by M1 who said that 'To be able to use the e-learning systems, the student must have a minimal knowledge of computer systems' (M1). Q2 argued that the having knowledge will computer system will make learning through the e-learning systems when he states that 'The better the student's computer knowledge the faster he will learn to use the e-learning system' Q2. As mentioned earlier, some of the interviewees have given lower ranks for the "knowledge with the computer systems" factors. Checking the interviews transcript to find reasons for such ranking shows that deep knowledge is not required to be able to use the e-learning system. This is according to K3 'e-learning systems are easy to use so basic knowledge should be enough to be able to use the system' (K3).

Three factors that relates to the students stand from the e-learning system were ranked as 2nd, 3rd and 4th most important CSFs for the system. These factors are students "Attitudes towards the e-learning" which was ranked as 2nd most important factor with total ranks of 22, their "Level of commitment" to learning through the e-learning system which was ranked as 3rd with total ranks of 25, and their "level of motivation" to use the e-learning system which was ranked as 4th most important factor with total ranks of 27. Looking for reasons for these rankings shows that interviewees believe it is important to have a positive stand on the e-learning system by the students in order for the system to succeed. For example, K3 states that 'It is important as it reflects how much the student learns' (K3).

On specific factors, K3 add that 'If students have a negative attitude towards e-learning they will never be able to use it and learn from it.' K2 claims that traditional tools of learning are still more popular than e-learning system when he states that '…Students tend to like traditional tools (paper based learning) over modern electronic devices.'.

K2 who gave a lower rank for students' "Level of commitment" states that"The instructor and school management can force the students to be more committed to e-learning through the applied regulations".

"Students' pace of learning" was ranked as 4th redundant factor which makes it at the same level of importance with total ranks of 27.

Students' demographic characteristics were ranked as the least important factor in the students' characteristics. Despite such low rank, some interviewees have given high importance to this factor in their explanation. For example, K2 stated the following: 'I think the levels of academic program followed by the age of the student are the most important factors…'(K2). K3 has also link age to learning using an e-learning system by stating that 'The younger the students start to use the e-learning system the better it is'. (K3). Some interviewees (e.g. M2), nevertheless, have denied any linkage between students' demographics and their successful usage of an e-learning system by stating the following: 'I don't think these demographic characteristics actually affect the educational gains of the students or the success of the e-learning system'.

6.6.2.3 Learning Environment Factors

Interviewee	Learning Management System (LMS)	Technical Infrastructure	Interactive Learning	Access and Navigation
Q1	4	2	3	1
Q2	2	1	4	3
M1	2	3	4	1
M2	2	1	3	4
k1	1	2	4	3
K2	3	2	1	4
K3	2	1	4	3
Total:	**16**	**12**	**23**	**19**

Table 6.8: Learning environment related e-learning CSF (numeric representation)

"Learning environment factors" category comes in 3rd place of importance among the five proposed categories. The category contains 4 factors and the results as shown in Table (6.4) show that "The technical infrastructure" factor has received high importance ranks (majority of interviewees ranked it 1st or 2nd) which put it in the position of most important CFSs in this category. The theme of reasons for this ranking as proposed by the interviewees focused on making it clear that lack of infrastructure means the failure of the e-learning systems. In this line, Q1 states that 'It is (technological infra-structure) the corner stone for the successful usage of LMS' (Q1).

Q2 focuses on the linkage between technological infra-structure and the usability of the e-learning system by stating that 'The lack of suitable technologies can lead to lack of usability of the systems'. Similar argument was proposed by M2 who stated that 'Without technological infrastructure, the system will not work in a suitable way' (M2).

Following "Technological infra-structure" in second most important factor was the "Learning Management System (LMS)" factor with a total rank of 16. Five interviewees have ranked this factor as 1st or 2nd and the other two interviewees ranked it 3rd and 4th most important CSF. Explaining their point of view, the interviewees emphasised the importance of having aa suitable LMS. For example, K1 states that 'Choosing the right LMS is very important for the success of e-learning system' (K1). M1 agrees with K1 by stating that it is 'Very important to have an efficient LMS as it helps the acceptance and the success of the e-learning system' (M1). M2 also agrees with the previous two interviewees and that 'It (the LMS) should be carefully chosen to suit the needs of the students and the learning materials'(M2).

The interviewees have also voted “Access and Navigation” factor in the 3rd place of importance among the 4 proposed factors. As it is shown in Table 6, the majority of the interviewees gave rather lower ranks to this factor (5 interviewees ranked it in the 3rd and 4th place). Despite that, it can be noticed that the elaboration of the rankings given by some of the interviewees has emphasised the importance of this factor. For example, M1 stated that ‘This is essential to increase the usage and enhance the e-learning system usability’ (M1). Agreeing with M1, Q1 has also stated that ‘There should be easy access to learning material so the e-learning system is successfully used’ (Q1). It is important to mention that M1 and Q1 have ranked “Access and navigation” as most important CSF in this category.

The interviewees who gave lower rankings for this factor explained their decision by stating reason such as ‘Access and navigation is important for easy reach of information, however, with good training, this importance can fade away’ (M2) and ‘If the above factors are available, then this is easy to achieve’ (K2)

“Interactive learning” was voted as the least important CSF in the Learning environment factors category with 6 votes of 3rd and 4th place. However, one interviewee believed that this factor is the most important factor in the category. He explained his decision by stating that ‘While interactive learning is important thorough the publicly available social media network so it doesn’t necessary means that the academic institution has to spend a lot of money to have interactive learning’. (K2)
His explanation makes it clear that K2 believe of the importance of the interactivity itself as a way to improve learning rather than having it as a part of any proposed e-learning system. The other interviewees who gave lower rankings for this factor reasoned their decision by emphasising its importance but also claiming that the system can survive and succeed without it. Two example of these reasons are as follows: ‘Interactivity relies on all other factors. A system has to have suitable technical infrastructure, good LMS, and easy navigation before it become interactive’ (Q2)

‘The least important factor the interactivity as I think it is good to have but the system will work without it’ (M2).

6.6.2.4 Instructional Design

Interviewee	Clarification of Objectives	Content Quality	Learning Strategies	Psychology of Learning	Learning Assessment
Q1	1	2	3	5	4
Q2	1	2	3	4	5
M1	1	3	4	2	5
M2	2	1	3	5	4
K1	1	2	3	5	4
K2	1	3	2	4	5
K3	5	3	1	2	4
Total	**12**	**16**	**19**	**27**	**31**

Table 6.9: Instructional Design Factors (numeric representation)

According to the interviews analysis, the Clarification of Objectives was considered as the most important factor among the offered 5 factors to the interviewees. In the total of importance values given to this factor was 12 which is a result of being placed as first by 5 of the interviewees, second by one interviewee, and last by one other interviewee. Further investigation of the interviews transcripts has shown that the main reason for such importance to be given to this factor is concerned with the reliance of achieving the sought learning outcomes on having clear objectives. For example, Q2 stated that 'The most important factor is the clarity of the objectives as based on that the outcomes of the learning process is decided. Objective should be clear and measurable' (Q2). Agreeing with Q2's perspective, (M1) stated that the 'Clarity of objective is the most important as without it, the educational process can lose track' (M1). These reasons make it arguable that clarity of objectives is not only important for e-learning-based education but also for classroom-based education. Within the context of e-learning-based education, (M2) associated the importance of this factor to the success of the e-learning as a whole when he clearly stated that it (Clarify of Objectives) "has a very important role in the success of e-learning system" (M2). As mentioned earlier, one interviewee has ranked this factor as the least important. It was interesting to check the reasons for such classification. According to the interview transcripts, this interviewee (K3) stated the following: "I don't think is an independent factor and it is associated with the content quality factor" (K3).

Thus, (K3) does not actually think that clarity of objectives is not that important; he, nevertheless, associate it with another factor (content quality).

Second most important factor in this category is the Content Quality factor which was ranked as most important by one interviewee, 2nd most important by 3 interviewees and 3rd most important by the other three interviewees. (M2), who ranked this factor as the most important stated that “the content should be of high quality and interesting for the students so it motivates them to learn” (M2). (Q2), one of the interviewees who ranked this factor as second most important stated that ‘The variety of contents will allow better learning’ (Q2). Moreover, (M1) who ranked it as 3rd most important argued that content quality “is the basis for good educational system and I believe it helps the success of the e-learning system” (M1).

Learning Strategies were placed in the third place of importance by the interviewees. One of the interviewees ranked it as most important, another interviewee classed it as 2nd most important, 3rd most important by another 3 interviewees, and fourth most important by 1 interviewees. Reasons for such ranking were given by the interviewees as follows: ‘Important to have clear strategies as it will help the instructor and the students to follow them’ (K3), ranked it as most important).

Some of the explanations for placing it in the third place are as follows. “Learning should be cooperated between students and instructors. The instructor should teach students how to learn on their own” (Q2). ‘The instructor and student should be aware of these strategies’ (Q1). The interviewee who placed it in fourth place gave the following elaboration: ‘It is an essential part of any educational system. Having different strategies can help the management to design a suitable learning for different types of students’ (M1).Thus, he believes it is important but it seems like he thinks other factors are more important. Psychology of Learning was ranked in the fourth place in terms of importance which was ranked in second place by 2 interviewees, 4 by another two interviewees, and 5 by the remaining 3 interviewees. One of the interviewee who ranked it in the second place stated that ‘It is always important to have a positive psychology towards learning to be able to learn’ (M1).

One of the interviewees who ranked it in the fourth place sated that ‘positive psychology of learning should be a target to be supported by management so the overall of e-learning can be achieved’.

(K2) And lastly one of the interviewees who ranked it in the fifth place justified that by the following reasons ‘I don’t think this is a part or has impact on e-learning system success’ (K1).

‘I think Psychology of Learning has a minimal impact of the progress of learning’ (Q1).

‘The development of psychology of learning can happen through both traditional and untraditional methods. So it is not directly or exclusively related to e-learning’ (M2)

The last factor and the least important according to the results if these interviews is the learning assessment, which was ranked by 4 by 4 interviewees and 5 by the remaining 3 interviewees. Some of the interviewees who ranked it at four gave the following explanations ‘This is associated with the standards followed for the learning’ (K3)‘There should be a variety of ways the students’ achievement are assessed with for example, exams and assignments’ (M2). On the other hand, some of the interviewees who ranked it as least important gave the following reasons. I don’t think it has a direct impact on the success of the e-learning system’ (M1) ‘It depends on the level of education and what is required form the student’ (Q2).

6.6.2.5 Support Related Factors

Interviewee	Communication Tools	Help Desk	Training
Q1	1	3	2
Q2	1	2	3
M1	2	3	1
M2	2	3	1
K1	3	1	2
K2	2	3	1
K3	3	2	1
Total:	**14**	**17**	**11**

Table 6.10: Support related factors related e-learning CSF (numeric representation).

In the least importance position among the five categories is the support related factors as explained earlier. This category included 3 factors; communication tools, help desk, and training. The analysis of the data showed that the interviewees ranked the availability of training factor as the most important among the three with total ranking of 11. The availability of communication tools was ranked in the second place of importance followed by the least important factors which is the availability of help desk services factors. Table 6.6 above shows these results.

In the justification space, the interviewees provided different reasons for giving the availability of training as the most important factor. For example, K3 and M2 gave the following two reasons to rank training as most important factors (giving it rank value of 1):'Most important factor for instructors more than the students' (K3). Training helps the student to explore the possibilities that can get from using the system (M2)

(Q1) put training in the second place and justified that by stating that training is 'Very important for the success of e-learning system' (Q1).

One interviewee (Q2) ranked the Training factor in the third place and justified that by stating that 'The training should be focused on the instructors but the availability of continuous help desk to help the instructors solve all the problems all the time is more important'(Q2).

Communication tools were ranked as second most important factor among the three. Two interviewees ranked it as first, other three interviewees ranked it as second most important, and other two ranked it as third. The interviewees who ranked it as most important justified their decision stating the following reasons: 'Without communication tools, the e-learning system will fail. As simple as that' (Q2). 'Communication tools are very important because they are the main tool to allow the success of the e-learning system and to connect the different users (instructors and students)' (Q1).

(K3), who placed it in the last place justified it as follows. "This is less important that the other two factors as it normally used when the university is off and in the evening to ask for solutions for some problems" (K3). Lastly, the help desk availability factor was placed as the least important factor among the support related e-learning CSF. According to the results, 1 interviewee has placed it as most important, 2 interviewees have place it as second most important, while the remaining four have placed it as the least important factor.

(K3) justified putting this factor in the place by emphasising its importance by stating that 'it is important for both instructors and students to allow faster learning' (Raid)

Placing it in the last place by two interviewees was justified by the following reasons 'In case the training and communications failed, the help desk should be able to help the users to do finish their tasks' (Q1). 'Help desk is only a temporary assistant with problem and not as important as training and communication tools' (M2).

The outcomes of this chapter are consistent with the results of other researchers (e.g. Selim, 2007; Bhuasiri et al., 2012). For example, the instructors' characteristics was found to be the most important category of e-learning CSFs by Selim (2007a) while students' characteristics category has been identified to be very important category by Bhuasiri et al. (2012) and Baylor and Ritchie (2002).

The following diagram summarises the results and it is based on the findings section above.

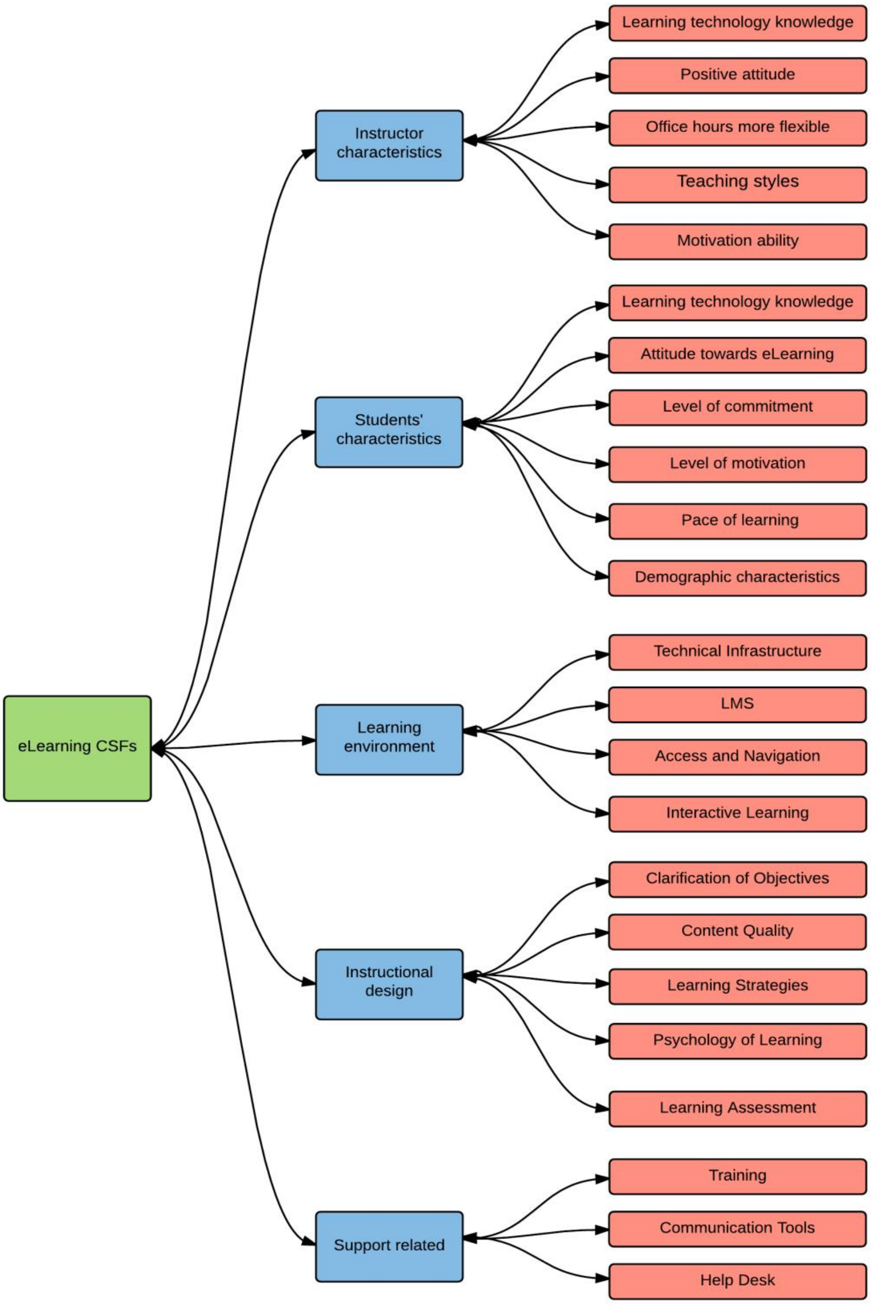

Figure 6.2.: e-learning CSFs in Saudi universities ordered by their importance

6.7 Summary and Conclusion

The main aim of this Preliminary study is to identify those factors that critically affect the success of e-learning systems in Saudi academic institutions the most, from experts' point of view. Using thematic analysis, data concerning 5 different categories of e-learning CSFs has been analysed. These categories are: Students' characteristics, instructor characteristics, learning environment, instructional design, and support related factors. The empirical results have shown that instructors' characteristic are the most influential category on the overall success of the e-learning systems, followed by students' characteristics, learning environment, instructional design, and support related factors respectively.

In terms of specific factors, technology competency has been identified as the most impactful factor for both the students and the instructor characteristics categories. These results are consistent with the results of Menchacaa and Bekele (2008), Bhuasiri et al. (2012) and Soong et al.'s (2001). In the learning environment category, the technical infrastructure was the most important. This outcome is consistent with the results of Selim, 2007a). Clarity of learning objectives and training were the most important CSFs in the instructional design and support related categories respectively. Training and its importance on the success of e-learning system implementation in Saudi Arabia has been identified as the most important e-learning CSF by Al-Homod and Al-Shafi (2013). An e-learning has "a combination of different stakeholders such as learner, instructor, administrative, faculty, technical staff, supporter, and the use of the Internet and other technologies" (Siritongthaworn et al., 2006).

The following chapter will present the actual data collection using the questionnaire instrument which was proposed in Chapter Four from academic staff, experts, and students, in King Saud University.

CHAPTER SEVEN: RESEARCH FINDINGS

7.1 Introduction

This chapter continues to present the actual data collection and analysis processes from three samples of population studies, namely, experts, academic staff, and students in King Saud University. To achieve this, the chapter is divided into seven main sections, including this introduction. Second section focuses on introducing Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFS) which is the main methodology used to analyse the collected data from the three samples. From Section Three to Section Five, the results of analysing the data of each sample following EFA and CFA techniques will be presented. Thus, section three focuses on presenting analysis results of data collected from Academic staff. Sections Four and Section Five presents the results of analysing students and experts' data. The Sixth section conducted internal comparisons with the results of the different samples. The chapter concludes and summarised in the Seventh Section.

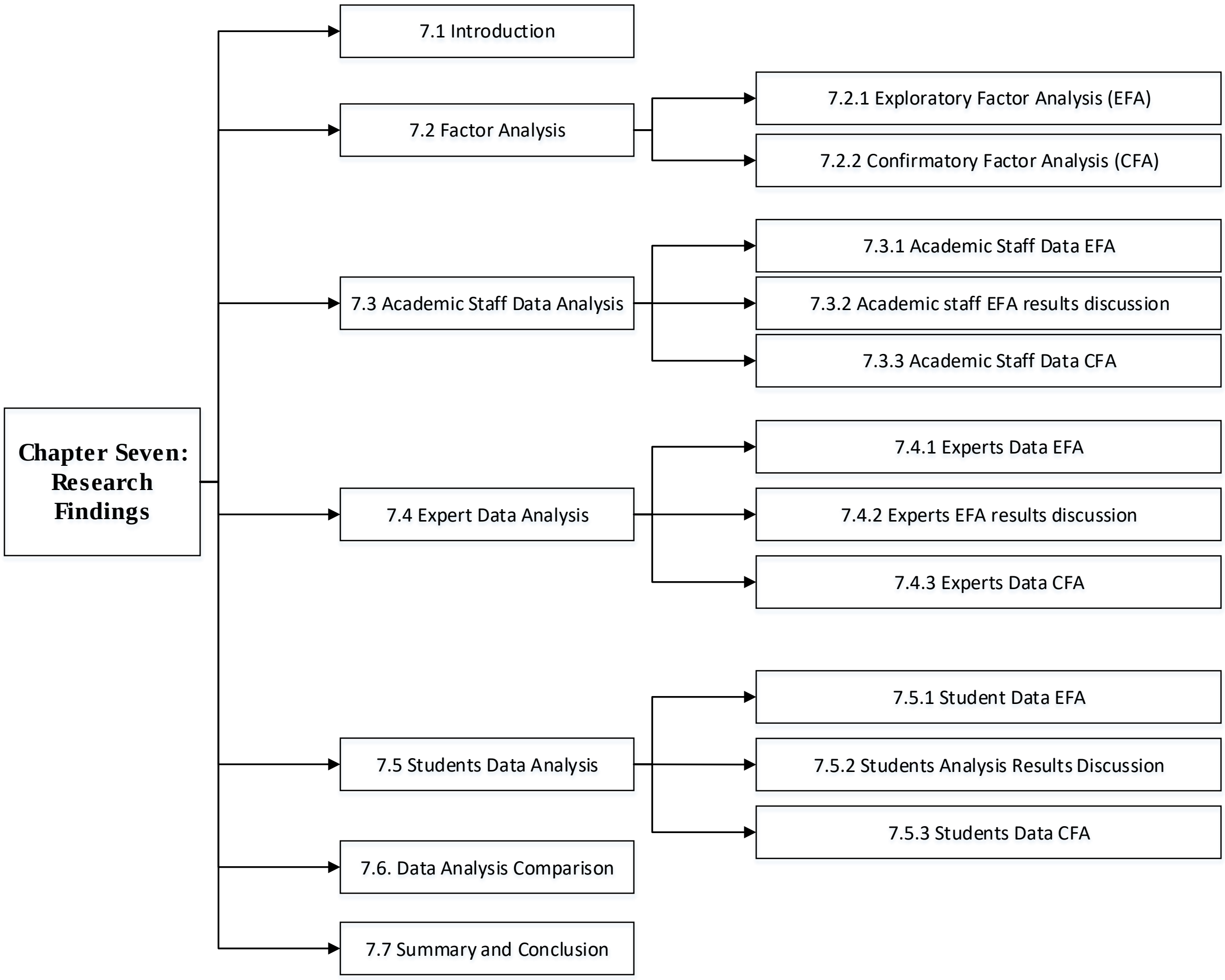

Figure 7.1: Chapter Sections

7.2 Factor Analysis

Factor analysis uses mathematical procedures for the simplification of interrelated measures to discover patterns in a set of variables (Child, 2006). The broad purpose of factor analysis is to summarise data so that relationships and patterns can be easily interpreted and understood. It is normally used to regroup variables into a limited set of clusters based on shared variance. Thus, it helps to isolate constructs and concepts. Large datasets that consist of several variables can be reduced by observing 'groups' of variables (i.e., factors) – that is, factor analysis assembles common variables into descriptive categories. Factor analysis is useful for studies that involve a few or hundreds of variables, items from questionnaires, or a battery of tests which can be reduced to a smaller set, to get at an underlying concept, and to facilitate interpretations (Rummel, 1970). It is easier to focus on some key factors rather than having to consider too many variables that may be trivial, and so factor analysis is useful for placing variables into meaningful categories. Many other uses of factor analysis include data transformation, hypothesis-testing, mapping, and scaling (Rummel, 1970).

The two main factor analysis techniques are Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). whereas EFA tries to uncover complex patterns by exploring the dataset and testing predictions, CFA attempts to confirm hypotheses and uses path analysis diagrams to represent variables and factors, The following section introduces EFA in more details.

7.2.1 Exploratory Factor Analysis (EFA)

EFA is used when a researcher wants to discover the number of factors influencing variables and to analyse which variables 'go together' (DeCoster, 1998). A basic hypothesis of EFA is that there are common 'latent' factors to be discovered in the dataset, and the goal is to find the smallest number of common factors that will account for the correlations (McDonald, 1985).Due to the complexity of its application and the differences between the authors about what pathway and what techniques should be followed to execute an EFA, Williams, Onsman, and Brown (2010) have proposed a simple protocol or model that represents a clear pathway for researchers to follow when they want to execute such an analysis. Figure 1 depicts this protocol which they refer to as "The Five-Step Exploratory Factor Analysis Protocol".

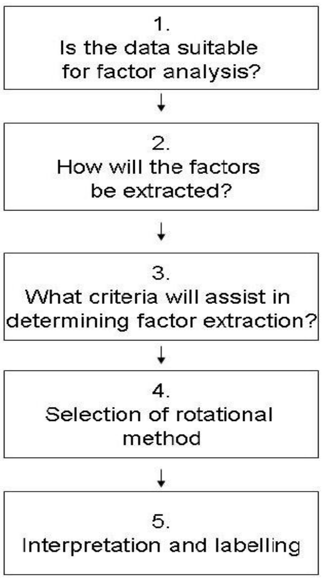

Figure 7.2: The Five-Step Exploratory Factor Analysis Protocol (Williams, Onsman, and Brown, 2010)

The second analysis technique is Confirmatory Factor Analysis(CFA) which is presented next.

7.2.2 Confirmatory Factor Analysis(CFA)

This study applies the CFA approach to assess the measurement model for academic staff, students and experts. The measurement model was drawn on the AMOS (version 22) graphics. In CFA, distinguishing between dependent and independent variables is not necessary for the measurement stage. CFA is run with all variables linked as shown in the Figure bellow where measured variables are shown in rectangular shapes by labels that match statements 1- 25 on the Likert scale. Latent variables are shown in the oval shapes. Two-headed connections indicate covariance between constructs. One-headed connectors indicate a causal path from a construct to an indicator.

One of the fit statistics to address this problem is the χ^2/df ratio or the normed chi square. Some state that the relative chi-square should be in the 2:1 or 3:1 range for an acceptable model; others say 2 or less or 3 or less reflects good fit or acceptable fit (Carmines and McIver, 1981) while others insist relative chi-square less than 1.0 is poor model fit (Byrne, 2001). Standardised root mean square residual (SRMR) values represent better fit and higher values represent worse fit (Hair et al., 2006). A value less than .05 is widely considered good fit and below .08 adequate fit. Another fit index that is commonly cited is root mean square error of approximation (RMSEA). Values less than 0.05 indicate good fit and values as high as.08 represent reasonable errors of approximation in the population. Confidence interval around the RMSEA value along with the closeness to fit p value (PCLOSE) is also reported by AMOS. The narrow interval values around the RMSEA value with insignificant p value ($p>.05$) is indicative of how well the model fits the data (Byrne, 2001). The incremental fit index is comparative fit index (CFI) which ranges between 0-1 with higher values indicating better fit. Values less than .90 are not usually associated with a model that fits well (Byrne, 2001; Hair et al., 2006). The model refinement process includes scanning the output and applying the following criteria to achieve the better fit:

1. Standardised Residual Covariances (S.R.C) should be above 2.58 or below -2.58 -what is known as the absolute value 2.58 (Byrne, 2001), and

2. Modification Indexes (MI) that reveal high covariance between measurement errors accompanied by high regression weights between these errors' construct are candidate for deletion (Byrne, 2001; Hair et al., 2006).

7.3 Academic Staff Data Analysis

The following section presents the application of EFA on the data collected from staff members according to the EFA analysis protocol described above.

7.3.1 Academic Staff Data EFA

7.3.1.1 Data Suitability for EFA

The first step of the protocol aims at deciding whether the EFA is the suitable approach to follow for analysing the data at hand or not. There are different approaches or tests which the researcher can use to make such a decision. For example, the sample size, the ratio between number of participants in the sample and number of variables in the study, Factorability of the correlation matrix, and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy/Bartlett's Test of Sphericity. Some authors rely on sample size as an indicator for the suitability of the data to be analysed using EFA. Nevertheless, there are disagreements in what constitutes as a suitable sample size. The guidelines in the literature vary. For example, Hair et al. suggests that a 100 participants sample is good enough to perform an EFA. Following these guidelines, in this research, it is believed that the academic staff sample falls in the good range as the number of participants has reached around 246 participants.

According to Henson and Roberts (2006), one of the most adopted tests to check the sample suitability for EFA is Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy/Bartlett's Test of Sphericity. The KMO index normally ranges between 0.00 and 1.00. To be suitable to apply EFA, the data KMO index should be 0.50 or higher. Nevertheless, 0.50 KMO index is only acceptable value for the data to be suitable for an EFA analysis. Some authors recommend that KMO index value to be between 0.5-0.70 so the collected data is moderately acceptable for EFA analysis, to range between 0.70 and 0.80 to be at a good level of suitability for EFA analysis, and 0.80 and 0.90 to be great for EFA analysis application. In the collected sets of data for from academic staff in this research project, the KMO index values were generated and it was 0.898 which means that the data were judged to be suitable for EFA analysis.

The other tests that are also widely adopted as a pre-check before extracting factors from the analysed data is the Bartlett's Test of Sphericity. The Bartlett's Test of Sphericity should be significant ($p<.05$) for factor analysis to be suitable. For the academic staff, the value for the significant was 0.000, which makes the data collected from both samples suitable for EFA analysis.

KMO and Bartlett's Test/Academic staff		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.898
Bartlett's Test of Sphericity	Approx. Chi-Square	3949.43
	Df	703
	Sig.	0.000

Table 7.1: KMO and Bartlett's Test for academic staff data

7.3.1.2 Factor Extraction

Once the data is checked for EFA application suitability, the next step is extract variables which are considered more important or more influential than others in the initial list of variables. Different ways can be used to extract these variables; however, Principal components Analysis (PCA) is the most widely used in the literature when statistical programmes are used (Thompson, 2004). Once the PCA is adopted and the total variance matrix has been generated, some rule or rules should be followed to actually extract the factors. The following table shows the matrix for the academic staff data. The extraction will be explained after.

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.825	28.488	28.488	10.825	28.488	28.488	3.237	8.519	8.519
2	3.073	8.086	36.574	3.073	8.086	36.574	3.180	8.369	16.887
3	2.051	5.398	41.972	2.051	5.398	41.972	2.807	7.388	24.275
4	1.637	4.307	46.279	1.637	4.307	46.279	2.801	7.371	31.646
5	1.443	3.796	50.075	1.443	3.796	50.075	2.780	7.315	38.961
6	1.286	3.385	53.460	1.286	3.385	53.460	2.453	6.456	45.418
7	1.279	3.365	56.825	1.279	3.365	56.825	2.445	6.433	51.851
8	1.144	3.010	59.836	1.144	3.010	59.836	2.379	6.261	58.112
9	1.052	2.768	62.604	1.052	2.768	62.604	1.707	4.492	62.604
10	.965	2.541	65.144						
11	.834	2.195	67.340						
12	.806	2.122	69.462						
13	.790	2.079	71.541						
14	.727	1.913	73.454						
15	.721	1.898	75.352						
16	.663	1.746	77.098						
17	.644	1.695	78.793						
18	.628	1.654	80.446						
19	.583	1.535	81.981						
20	.558	1.468	83.449						
21	.514	1.352	84.801						
22	.497	1.309	86.110						
23	.460	1.211	87.321						
24	.425	1.118	88.438						
25	.410	1.078	89.516						
26	.405	1.066	90.583						
27	.400	1.053	91.635						
28	.378	.996	92.631						
29	.357	.938	93.569						
30	.347	.913	94.482						
31	.339	.891	95.374						
32	.319	.839	96.213						
33	.273	.718	96.931						
34	.268	.705	97.635						
35	.258	.678	98.314						
36	.229	.603	98.916						
37	.216	.569	99.485						
38	.196	.515	100.000						
Extraction Method: Principal Component Analysis.									

Table 7.2: Academic staff component matrix

There are several techniques which can be followed to extract factors; for example, Cumulative Percentage of Variance and Eigenvalue > 1 Rule, Scree Test, and Parallel Analysis. In this chapter, Cumulative Percentage of Variance and Eigenvalue > 1 Rule will be applied. According to Cumulative Percentage of Variance and Eigenvalue > 1 Rule, the researcher extracts the factors with initial Eigenvalue > 1. The cumulative percentage of variance of these factors shows the percentage of the variations these factors explain.

To apply this rule on the academic staff data, the components (variables) from 1-9 match the criteria of initial Eigenvalue > 1. The table lists the eigenvalues associated with each factor (linear component) before extraction and after extraction. Also, the percentage of variance explained by each factor is shown. For example, factor one explains 28.5%. Notice that the first few factors explain relatively larger amount of variance whereas the subsequent factors explain the small amount of variance. SPSS only extracts factors with eigenvalues greater than 1. Hence, only, 9 factors were extracted with total variation equal to 62.60%.

7.3.1.3 Rotation

Another consideration when deciding how many factors will be analysed is whether a variable might relate to more than one factor. Rotation maximises high item loadings and minimises low item loadings, therefore producing a more interpretable and simplified solution. There are two common rotation techniques: 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 produce factor structures that are uncorrelated. The following table is generated based on the rotated matrix for academic staff.

Factor	Items	Component
(1)	S1 Students' willingness to participate in e-learning	.569
	S2. The student's learning style affecting the use of eLearning	.666
	S3 The student's ability to find things in eLearning system	.720
	S4 Student's experience and knowledge about computers	.689
	S6 The student's understanding of the purpose	.540
(2)	T4 Internet speed	.589
	T5 Availability of multimedia tools/technologies	.463
	T6 Ability to search for learning material using the website	.591
	E4 Ease of learning material preparation	.545
	E5 Language Support	.669
(3)	T8. Reliable technical infrastructure	.589
	E6. Sufficiency of the learning materials	.422
	E7. Course interactivity	.634
	E8. Availability of communications with the instructor in the eLearning system	.633
	ST5. Availability of on campus printing facilities	.388
(4)	T1 Easy access to internet	.787
	T2 Browsing is easy	.760
	T3 Availability of online communication tools (e.g.-mail)	.620
	E12 Whether the learning material is up-to-date	.386
(5)	I1 My enthusiasm while teaching using eLearning tools	.638
	I2 My ability to motivate the students to use the eLearning system	.705
	I3 The clarity of my explanation of the eLearning components	.717
	I4 My ability to use the eLearning system effectively	.566
	I5 My style of teaching using eLearning technologies	.606
(6)	E1 Ease of registration on e-learning course.	.682
	E2. Access to the e-learning resources on and off campus	.682
	E3 The layout and design of information	.670
(7)	ST1 Availability of offline technical support	.380
	ST2 Friendliness of support team	.722
	ST3 Availability of online help desk	.786
	ST4 Availability of training	.686
(8)	I7 My ability to motivate students to get engaged in online discussions	.649
	E9 Availability of online test/quizzes.	.547
	E10 Option to return to unfinished tasks	.471
	E11 Measurement of learning progress	.680
(9)	I6 My friendliness in general and while teaching	.631
	S5 The level of student's enjoyment while using technology	.649
	T7 Availability of sufficient computer labs	.415

Table 7.3:Academic staff rotated matrix

Once the chosen rotation has been applied, the next step was to remove the low loading items and the factors, which have less than two items loaded onto them. The rule of thumb is to remove items with less than 0.5 loading first then to remove the component with one item loading on them second. On those bases, item T7 in the 9th category of academic staff rotated matric should be removed. After this step, all 9 categories can be left as they all have 2 or more items loaded on them.

Factor	Items	Component
(1)	S1 Students' willingness to participate in e-learning S2. The student's learning style affecting the use of eLearning S3 The student's ability to find things in eLearning system S4 Student's experience and knowledge about computers S6 The student's understanding of the purpose	.569 .666 .720 .689 .540
(2)	T4 Internet speed T6 Ability to search for learning material using the website E4 Ease of learning material preparation E5 Language Support	.589 .591 .545 .669
(3)	T8. Reliable technical infrastructure E7. Course interactivity E8. Availability of communications with the instructor in the eLearning system	.589 .634 .633
(4)	T1 Easy access to internet T2 Browsing is easy T3 Availability of online communication tools (e.g.-mail)	.787 .760 .620
(5)	I1 My enthusiasm while teaching using eLearning tools I2 My ability to motivate the students to use the eLearning system I3 The clarity of my explanation of the eLearning components I4 My ability to use the eLearning system effectively I5 My style of teaching using eLearning technologies	.638 .705 .717 .566 .606
(6)	E1 Ease of registration on e-learning course. E2. Access to the e-learning resources on and off campus E3 The layout and design of information	.682 .682 .670
(7)	ST2 Friendliness of support team ST3 Availability of online help desk ST4 Availability of training	.722 .786 .686
(8)	I7 My ability to motivate students to get engaged in online discussions E9 Availability of online test/quizzes. E11 Measurement of learning progress	.649 .547 .680
(9)	I6 My friendliness in general and while teaching S5 The level of student's enjoyment while using technology	.631 .649

Table 7.4 Academic staff matrix after removal of low loading items

7.3.1.4 Interpretation

Interpretation involves the researcher examining which items are loaded onto a factor, and then give that factor a name or theme which reflects the nature of these items. Traditionally, at least two or three variables must load on a factor so it can be given a meaningful interpretation. If a factor has less than 2 items loaded onto it, it can be ignored from the results (Henson and Roberts, 2006). The process of labelling the factors is a subjective, theoretical, and inductive process. The following table shows the final table for academic staff CSFs and the items loaded onto them.

Factor	Items	Component
Student characteristics	S1 Students' willingness to participate in e-learning S2. The student's learning style affecting the use of eLearning S3 The student's ability to find things in eLearning system S4 Student's experience and knowledge about computers S6 The student's understanding of the purpose	.569 .666 .720 .689 .540
E-learning system	T4 Internet speed T6 Ability to search for learning material using the website E4 Ease of learning material preparation E5 Language Support	.589 .591 .545 .669
Experience	T8. Reliable technical infrastructure E7. Course interactivity E8. Availability of communications with the instructor in the eLearning system	.589 .634 .633
Technology Infrastructure	T1 Easy access to internet T2 Browsing is easy T3 Availability of online communication tools (e.g.-mail)	.787 .760 .620
Instructor characteristics	I1 My enthusiasm while teaching using eLearning tools I2 My ability to motivate the students to use the eLearning system I3: The clarity of my explanation of the eLearning components I4: My ability to use the eLearning system effectively I5: My style of teaching using eLearning technologies	.638 .705 .717 .566 .606
System access	E1: Ease of registration on e-learning course. E2: Access to the e-learning resources on and off campus E3: The layout and design of information	.682 .682 .670
Support and training	ST2: Friendliness of support team ST3: Availability of online help desk ST4: Availability of training	.722 .786 .686
E-learning sources	I7: My ability to motivate students to get engaged in online discussions E9: Availability of online test/quizzes. E:11 Measurement of learning progress	.649 .547 .680
Students Engagement	I6: My friendliness in general and while teaching S5: The level of student's enjoyment while using technology	.631 .649

Table 7.5: Academic staff new factors

7.3.2 Academic Staff EFA results discussion

In this section, a deeper analysis and interpretation of the results will be presented. However, for clarity, the items loaded on each factor have been ordered based on their loading value (the component column). This is shown in the following table.

Factor	Items	Component
Student characteristics	S3 The student's ability to find things in eLearning system	0.721
	S4 Student's experience and knowledge about computers	0.689
	S2 The student's learning style affecting the use of eLearning	0.666
	S1 Students' willingness to participate in e-learning	0.569
	S6 The student's understanding of the purpose	0.542
E-learning system	E5 Language Support	0.669
	T6 Ability to search for learning material using the website	0.591
	T4 Internet speed	0.589
	E4 Ease of learning material preparation	0.545
Experience	E7 Course interactivity	0.634
	E8 Availability of communications with the instructor in the eLearning system	0.633
	T8 Reliable technical infrastructure	0.589
Technology Infrastructure	T1 Easy access to internet	0.787
	T2 Browsing is easy	0.760
	T3 Availability of online communication tools (e.g.-mail)	0.620
Instructor characteristics	I3 The clarity of my explanation of the eLearning components	0.717
	I2 My ability to motivate the students to use the eLearning system	0.705
	I1 My enthusiasm while teaching using eLearning tools	0.638
	I5 My style of teaching using eLearning technologies	0.606
	I4 My ability to use the eLearning system effectively	0.566
System access	E1 Ease of registration on e-learning course.	0.682
	E2 Access to the e-learning resources on and off campus	0.682
	E3 The layout and design of information	0.670
Support and training	ST3 Availability of online help desk	0.786
	ST2 Friendliness of support team	0.722
	ST4 Availability of training	0.686
E-learning sources	E11 Measurement of learning progress	0.680
	I7 My ability to motivate students to get engaged in online discussions	0.649
	E9 Availability of online test/quizzes.	0.547
Student engagement	S5 The level of student's enjoyment while using technology	0.649
	I6 My friendliness in general and while teaching	0.631

Table 7.6: Academic staff items ordered by their loading values

As the table above shows, the academic staff results maintained the same number of initial nine factors. However, the names of these factors have been changed to suit the items loaded on each factor as it was shown in the interpretation step. Furthermore, order by the total Variance Explained as shown in table 7.6, the first factor which has been kept as the students' characteristics is the most important according to the academic staff point of view. The least important factor is the ninth, which has been renamed to students' engagement factor. eLearning system is the second most important factor according to these results. The academic staff experience with the eLearning system, Technology Infrastructure, instructors' characteristics, System access, support and training, and the eLearning system sources have been ranked as 3rd, 4th, 5th, 6th, 7th, and 8th most important factors respectively; All that is according to the academic staff point of view.

In terms of each category and the items loaded on it, the items loaded on each factor have been ordered by their importance from low to high. That importance has been measured by the item's loading value on the factor. According to these values, the student's ability to find things in eLearning system is the most important item within students' characteristics. That is followed by student's experience and knowledge about computers, the student's learning style affecting the use of eLearning, students' willingness to participate in e-learning, and the student's understanding of the purpose which is the least important item in the students' characteristics factor.

In the second most important factor which is the eLearning system, language Support has been ranked as the most important item followed by the students' ability to search for learning material using the website, internet speed, and the ease of learning material preparation. It can be noticed that the second most important item in this factor can be related to the first most important item in the students' characteristics factor.

The experience factor has three factors which focus on the users' experience with the eLearning system was rated as the third most important factor. Course interactivity has been ranked as the most important item loaded to this factor and this was followed by the availability of communications with the instructor in the eLearning system. The least important item loaded to this factor was reliable technical infrastructure.

Technology Infrastructure was ranked as the fourth most important factor among the nine final factors. The items loaded to this factor are in a way similar to those loaded on the experience factor. Among the three items loaded to this factor, easy access to internet was ranked as the most important item. This was followed by the ease of browsing is easy, while the least important was the availability of online communication tools (e.g.-mail).

The academic staff have ranked the instructors' characteristics as the fifth most important factor. As the name of this factor reflects, the items loaded to this factor focus on the instructors, their characteristics and their experiences with the eLearning system. The five items which are loaded to this factor were ranked as the clarity of the instructors' explanation of the eLearning components to be the most important, followed by the instructors' ability to motivate the students to use the eLearning system. The instructor's enthusiasm while teaching using eLearning tools was ranked as the third most important item. The instructor's style of teaching using eLearning technologies and his or her ability to use the eLearning system effectively were ranked as fourth and fifth most important items loaded to this factor respectively.

The ability of staff members to access the system (System access) has been ranked as the sixth most important factor. This factor and the items loaded to it can be related to other factors; specifically, to the eLearning system and experience factors. Three items were loaded to this factor and they were ranked as access to the e-learning resources on and off campus to be the most important item, followed by the ease of registration on e-learning course as second most important, and least important is the layout and design of information.

Support and training was ranked as the seventh most important factor by academic staff. As the name reflect, this factor focuses on issues and items related to the availability of the support and training on how to use the eLearning system. The availability of online help desk was ranked as most important item loaded to this factor followed by Friendliness of support team. The least important item loaded to this factor is the availability of training.

E-learning sources were rated as eighth most important factor by the academic staff. The items loaded to this factor focus on the facilities and utilities the eLearning system makes available to its users. Measurement of learning progress was ranked as the most important item among the four items loaded to this factor. This is followed by the instructors' ability to motivate students to get engaged in online discussions and the availability of online test/quizzes as second and third most important items loaded to this factor.

The least important factor based on the total variance it explains was the students' engagement factor. Two items were loaded to this factor and they focus on specific issues that concern the atmosphere of the learning environment while using the eLearning system. The level of student's enjoyment while using technology was ranked as most important item while the instructors' friendliness in general and while teaching is the least important.

7.3.3 Academic Staff Data CFA

The first step in performing CFA is to check the measurement model. The researcher needs to perform CFA for all latent constructs involved in the study before modeling their inter-relationship in a structural model (SEM). The fitness of a measurement model is indicated through certain Fitness Indexes. However, the items deletion should not exceed 20% of total items in a model. Otherwise the particular construct itself is deemed to be invalid since it failed the "confirmatory" itself.

Figure 7.10 shows the measurement model for academic staff. The initial results given in the Table 7.8 shows that the fit indices are somewhat poor. Using model refinement criteria, five items were deleted (s1, i4, e8 and t4). As a result, the fit indices reached the acceptable levels, see Table 7.7.

	χ^2/df (CMIN/df)	**SRMR**	**CFI**	**RMSEA**	**PCLOSE**
Initial results	2.17	.072	.832	.069	.000
After deleting: s1, i4, e8, s2 and t4	1.613	.053	.092	.050	.472

Table 7.7: fit indices for academic staff

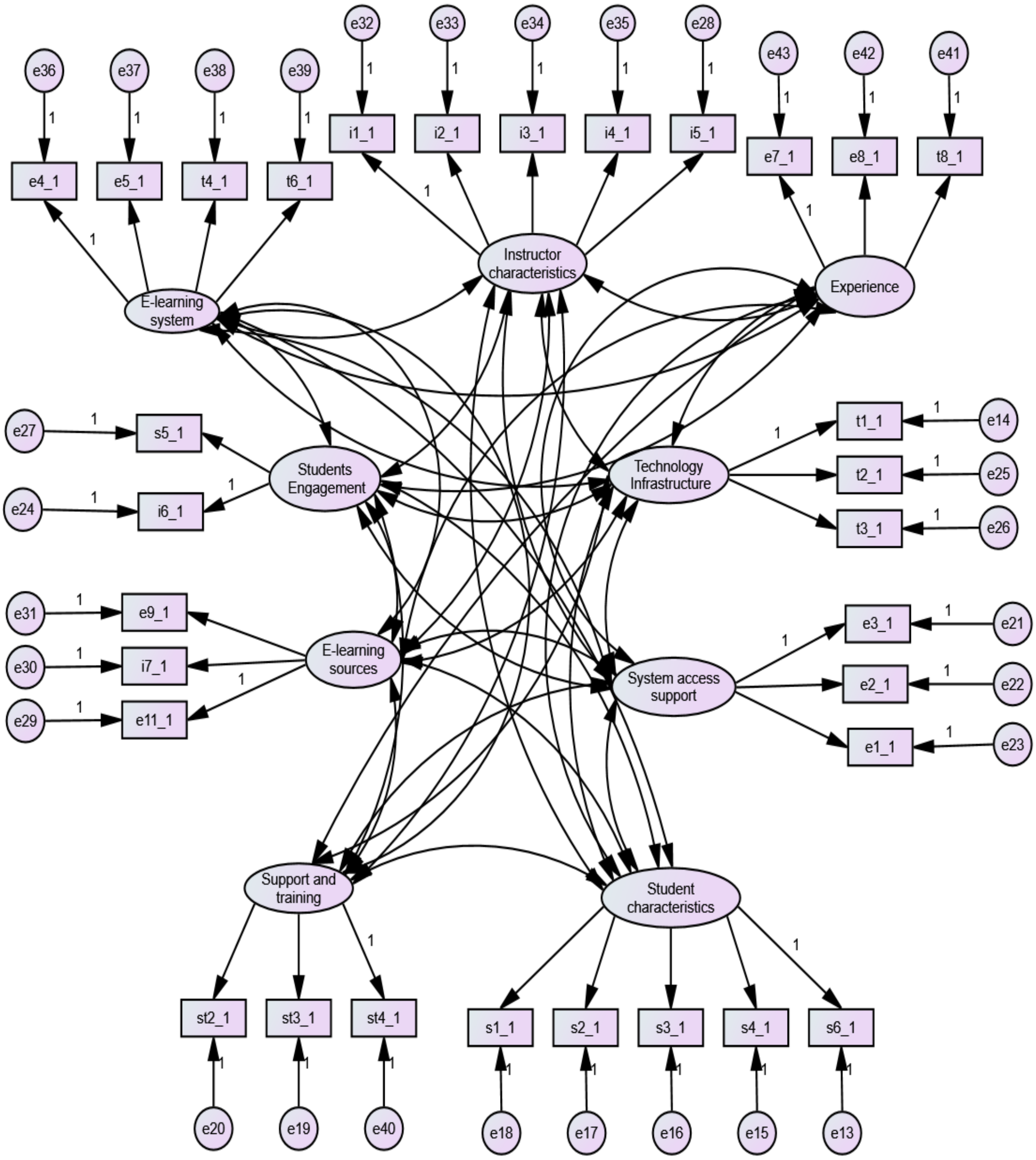

Figure 7.3: measurement model for academic staffs

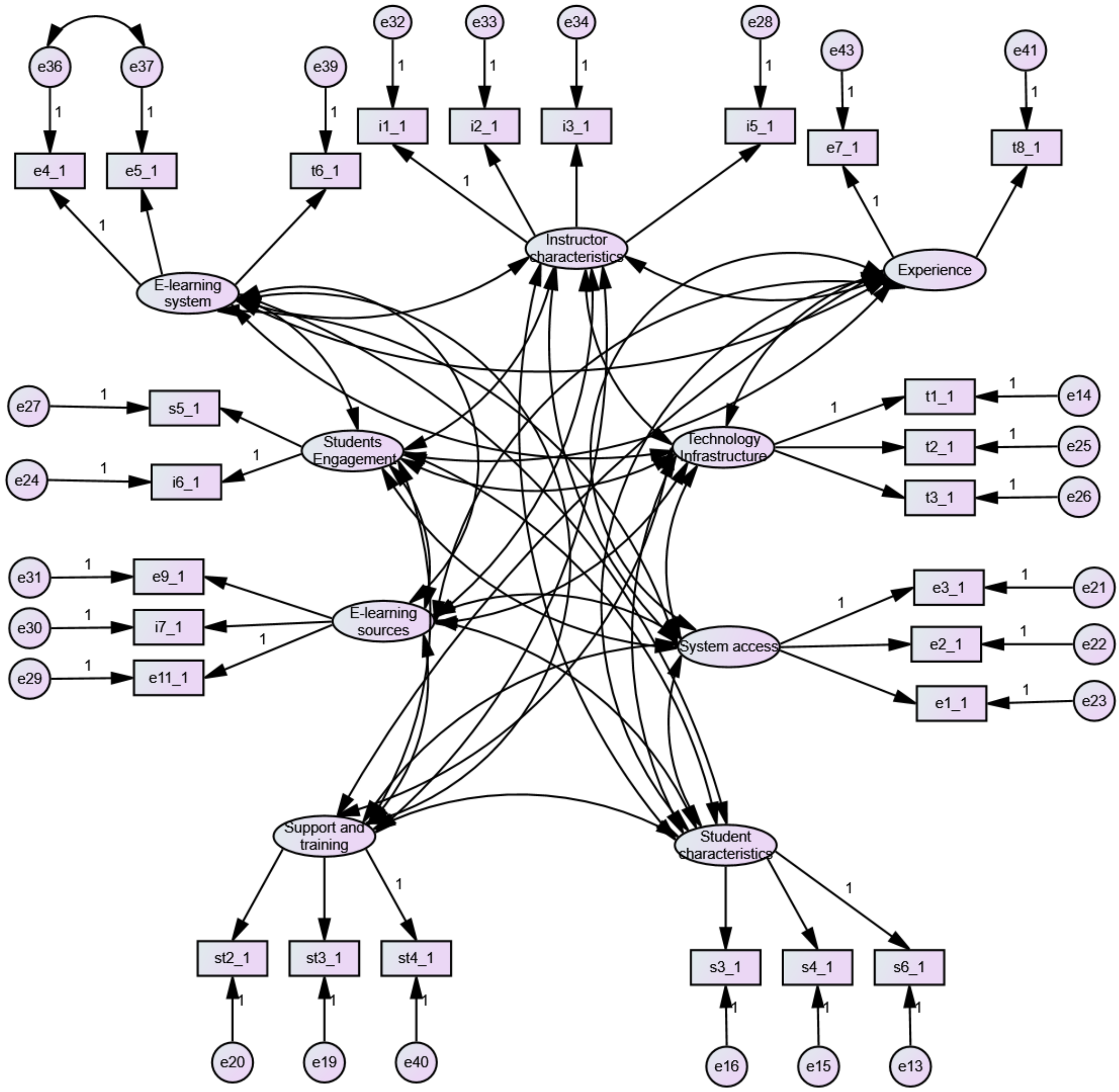

Figure 7.4: measurement model for academic staffs after improving

The next step is to examine validity and reliability.

7.3.3.1 Validity and Reliability for Academic Staff

The squared multiple correlation coefficient represented the amount of variance of one variable explained by the other observed variables (Schumacker and Lomax, 2004). It will be used to measure the reliability of each item (Bagozzi and Yi, 2012). If SMC exceed 0.50, then the observed item has a good reliability and validity, and also 0.30 is considered as an acceptable level (Holmes-Smith, 2011).

Item	Estimate
e9_1	.394
i7_1	.399
e11_1	.511
i5_1	.506
s5_1	.462
t3_1	.401
t2_1	.609
i6_1	.273
e1_1	.393
e2_1	.513
e3_1	.500
st2_1	.364
st3_1	.543
s3_1	.680
s4_1	.572
t1_1	.479
s6_1	.592
t8_1	.440
e7_1	.528
t6_1	.235
e5_1	.293
st4_1	.493
e4_1	.516
i3_1	.520
i2_1	.318
i1_1	.316

Table 7.8 Squared Multiple Correlations: (Group number 1 - Default model)

Factor	Item
Students Engagement	S5 The level of student's enjoyment while using technology
	I6 My friendliness in general and while teaching
E-learning system	E5 Language Support
	T6 Ability to search for learning material using the website
	T4 Internet speed
	E4 Ease of learning material preparation

Table 7.9 Factors were dropped.

I6 showed low squared-correlation (0.273) and hence it was dropped. As a result, engagement factor was dropped since one item cannot represent a factor. For e-learning system, T6 showed low squared-correlation (0.235) and hence it was dropped. Then, the analysis was repeated. The table below showed that all items has squared-correlation higher than 0.30.

Item	Estimate
e9_1	.390
i7_1	.400
e11_1	.516
i5_1	.499
t3_1	.384
t2_1	.662
e1_1	.401
e2_1	.512
e3_1	.495
st2_1	.367
st3_1	.548
s3_1	.670
s4_1	.564
t1_1	.450
s6_1	.608
t8_1	.434
e7_1	.536
e5_1	.423
st4_1	.486
e4_1	.823
i3_1	.523
i2_1	.329
i1_1	.312

Table 7.10 Squared Multiple Correlations: (Group number 1 - Default model)

- **Unidimensionality**

"Unidimensionality is the degree to which items load only on their respective constructs (factors) without having "parallel correlational pattern(s)" (Segars, 1997). Nunally (1978) declared the necessity of examining the unidimensionality of each construct incorporated in the conceptual model as prerequisite step for validity and reliability tests. Unidimensionality is achieved when all measuring items have acceptable factor loadings for the respective latent construct. In order to ensure unidimensionality of a measurement mode, unidimensionality also requires all factor loadings to be positive and the factor loading for every item should exceed 0.5 (Bin and Afthanorhan, 2014; Segars, 1997; Zainudin, 2010). Table below showed that all the items had positive loading and exceeded 0.5.

Item	Factor	Estimate
i1_1	Instructor Characteristics	.558
i2_1	Instructor Characteristics	.574
i3_1	Instructor Characteristics	.723
e4_1	E-learning System	.907
st4_1	Support and Training	.697
e5_1	E-learning System	.650
e7_1	Experience	.732
t8_1	Experience	.658
s6_1	Student Characteristics	.780
t1_1	Technology Infrastructure	.671
s4_1	Student Characteristics	.751
s3_1	Student Characteristics	.818
st3_1	Support and Training	.740
st2_1	Support and Training	.606
e3_1	System access	.703
e2_1	System access	.715
e1_1	System access	.633
t2_1	System access	.813
t3_1	System access	.620
i5_1	Instructor characteristics	.706
e11_1	E-learning sources	.718
i7_1	E-learning sources	.632
e9_1	E-learning sources	.624

Table 7.11: the items which have positive loading and exceeded 0.5.

- **Discriminant Validity**

"Discriminant validity is considered a key measure to test the instrument because without it researchers cannot be certain whether results confirming hypothesised structural paths are real or whether they are a result of statistical discrepancies" (Farrell, 2010, p.324). Discriminant validity is supported if the square root of average variance extracted of each construct is more than its correlation with other constructs (Guo et al., 2011). The table

Factors	1	2	3	4	5	6	7	8
System access	**0.751**							
Instructors characteristics	0.482	**0.676**						
e-learningsystem	0.654	0.436	**0.789**					
Supportandtraining	0.549	0.334	0.433	**0.683**				
Experience	0.741	0.542	0.431	0.441	**0.712**			
Students characteristics	0.436	0.519	0.656	0.474	0.262	**0.783**		
Technology infra-structure	0.494	0.371	0.326	0.414	0.460	0.218	**0.706**	
e-Learning sources	0.564	0.550	0.709	0.565	0.563	0.695	0.317	**0.659**

Table 7.12: the results achieved a satisfactory level of discriminant validity.

below showed that the results achieved a satisfactory level of discriminant validity.

- **Convergent Validity**

Convergent validity is an important aspect to assess the constructs. It evaluates relationships between the observed variables and the constructs (Schumacker and Lomax, 2004). According to Hair et al. (2010) the term convergent validity specifies the degree to which the items of a particular construct converge or share a high proportion of variance in common. Factor loading, variance extracted and composite reliability can be used to assess convergent validity. The resulting loading is used to assess the convergent validity, and this type of validity is achieved when each item loading in the construct exceed 0.50 in order to achieve convergent validity (Aggelidis and Chatzoglou, 2012; Gefen and Straub, 2005; Hair et al., 2010; Holmes-Smith, 2011; Sun and Teng, 2012). The validity can be achieved if the value of factor loading is significantly different from zero using critical ratio (Holmes-Smith, 2011). The values of resulting factor loading that is shown in Moreover all the items were highly significant. The convergent validity could also be verified by computing the Average Variance Extracted (AVE) for every construct. The value of AVE should be 0.5 or higher for this validity to achieve (Holmes-Smith, 2011). Based on the results given in the table below, the AVE was more than 0.5 or very close 0.5 which was accepted.

- **Construct reliability (CR)**

Construct reliability (CR) is used to measure the reliability of all the observed variables that represent the construct, in order to examine the internal consistency of the measures (Holmes-Smith, 2011). A value of construct reliability less than 0.70 can be acceptable (Bagozzi and Yi, 2012). A value of CR>= 0.6 is required in order to achieve CR for constructs (Zainudin, 2012). From the table below, the resulting CR was higher than or closer to 0.70 indicating that the constructs of the model are reliable.

- **Cronbach's alpha**

Cronbach’s alpha is computed for measuring an internal consistency so that reliability for each construct model is obtained (George and Mallery, 2012). George the recommended level of Cronbach's alpha is 0.70, and 0.60 is acceptable for exploratory research (Hair et al., 2006).

From the table, Cronbach's alpha ranged from > 0.60, which indicated that the resulting model reliability was very satisfying.

	CR	AVE	Cronbach's alpha
System access	0.725	0.469	.754
Instructor characteristics	0.737	0.478	.734
e-learning system	0.763	0.623	.741
Support and training	0.723	0.507	.709
Experience	0.657	0.484	.646
Student characteristics	0.826	0.614	.826
Technology infra-structure	0.746	0.499	.674
e-learning sources	0.697	0.533	.694

Table 7.13: the results achieved a satisfactory level of CR, AVE and Cronbach's alpha.

The following figure depicts the final factors and the items related to them after performing all the tests explained in the previous sections.

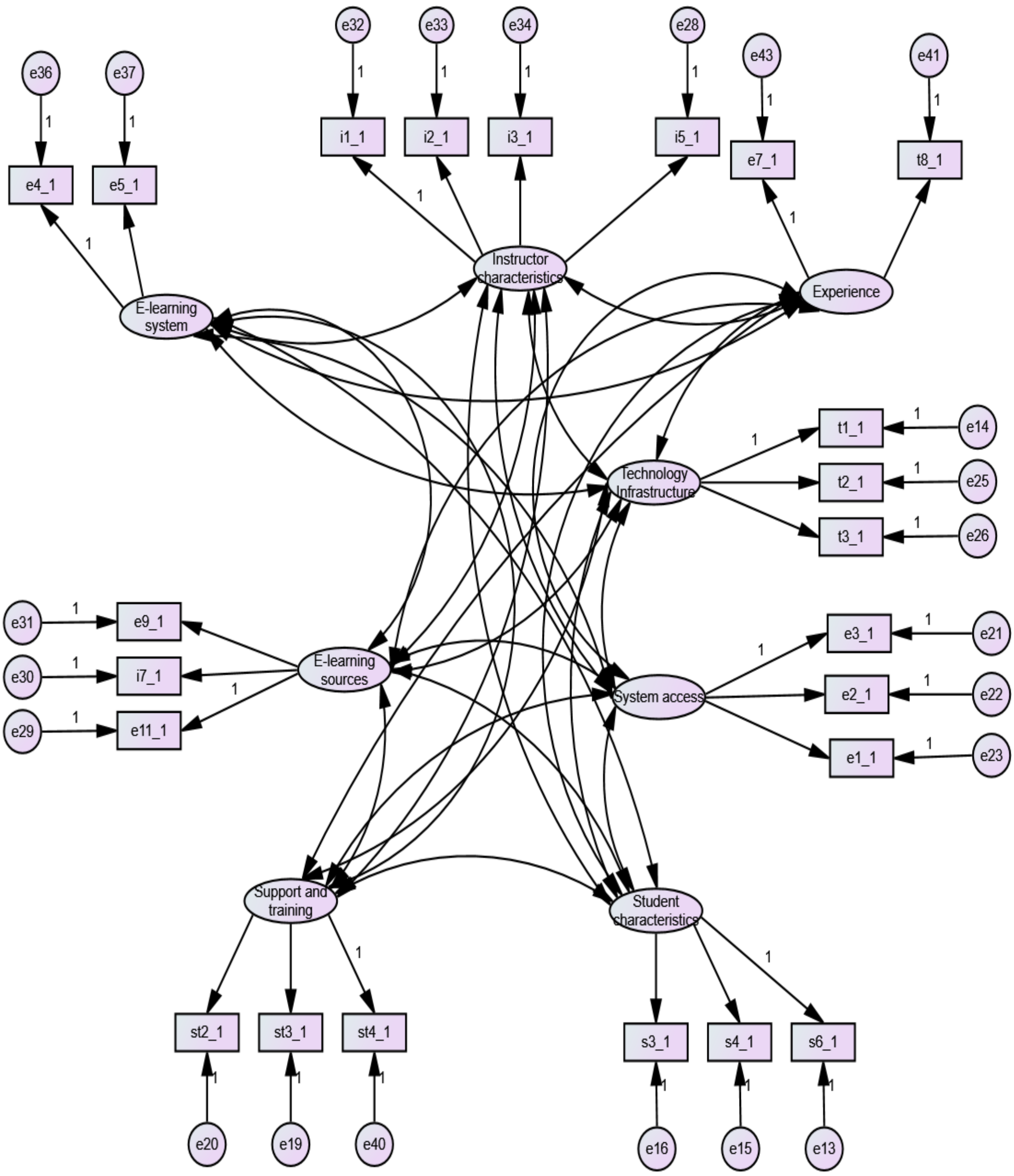

Figure 7.5 depicts the final factors and the items related to them

The following table also shows these factors and items after applying the tests described above.

Factor	Items
Student characteristics	S3: The student's ability to find things in eLearning system
	S4: Student's experience and knowledge about computers
	S6: The student's understanding of the purpose
E-learning system	E5: Language Support
	E4: Ease of learning material preparation
Experience	E7: Course interactivity
	T8: Reliable technical infrastructure
Technology Infrastructure	T1: Easy access to internet
	T2: Browsing is easy
	T3: Availability of online communication tools (e.g.-mail)
Instructor characteristics	I3: The clarity of my explanation of the eLearning components
	I2: My ability to motivate the students to use the eLearning system
	I1 My enthusiasm while teaching using eLearning tools
	I5 My style of teaching using eLearning technologies
System access	E1 Ease of registration on e-learning course.
	E2 Access to the e-learning resources on and off campus
	E3 The layout and design of information
Support and training	ST3 Availability of online help desk
	ST2 Friendliness of support team
	ST4 Availability of training
E-learning sources	E11 Measurement of learning progress
	I7 My ability to motivate students to get engaged in online discussions
	E9 Availability of online test/quizzes.

Table 7.14 the final factors and the items related to them

As the table shows, in comparison with EFA analysis results, the students characteristics factor has lost the 'S2: The student's learning style affecting the use of eLearning' and 'S1: Students' willingness to participate in e-learning' items. The E-Learning system factor as lost the 'T6: Ability to search for learning material using the website' and 'T4: Internet speed' items. The Experience factor has lost 'E8: Availability of communications with the instructor in the eLearning system' item. Technology infra-structure factor has maintained all its loaded items. The instructor characteristics factor has lost 'I4: My ability to use the eLearning system effectively' item. The system access factor has also maintained all its loaded items. The items loaded to the support and training factor have passed all the tests and therefore were maintained in the CFA results. The same goes for the e-Learning sources factor where all of its loaded items have been maintained. The exception is with the engagement where all its loaded items have failed to pass the tests and therefore the whole factors and its items were removed in the CFA results.

7.4 Expert Data Analysis

The same steps followed to perform academic staff data analysis have also been performed on experts' data. The following subsections presents the results of these steps.

7.4.1 Experts Data EFA

7.4.1.1 Experts' Data Suitability for EFA

Before getting into analysing the data, it was checked for its suitability for EFA analysis. Sample size, KMO measure, and Bartlett's Test of Sphericity were used to check the academic staff data for EFA suitability and they will be used with the experts' data. The sample size of experts who actually participated in responding to the questionnaire was 126 which, according to Hair is a suitable size for EFA analysis (i.e. greater than a 100). Following the KMO and Bartlett's Test of Sphericity measures, the sample also passes as suitable for EFA analysis. In terms of KMO measure, it has to between 0.5 and 0.7 to pass as suitable. The expert data has scored 0.69 which is at the high end of the suitable range. Finally, the Bartlett's Test of Sphericity, to pass the significant has to <0.05. For experts' data, the significant was 0.000, which makes the data collected from both samples suitable for EFA analysis. The following table shows these test results.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.690
Bartlett's Test of Sphericity	Approx. Chi-Square	1047
	Df	406
	Sig.	.000

Table 7.15: KMO and Bartlett's Test for Expert's data

Once the data deemed to be suitable for EFA, the next step is to extract the most significant factors as follows.

7.4.1.2 Factor extraction

The second step is to extract variables which are considered more important or more influential than others in the initial list of variables. PCA was used with the academic staff and students' data and it will also be used here. The table below lists the eigenvalues associated with each factor (linear component) before extraction and after extraction. Also, the percentage of variance explained by each factor is shown. For example, factor one explains 19.03%, and after using rotation extraction, it becomes 8.45%. Notice that the first few factors explain relatively larger amount of variance whereas the subsequent factors explain the small amount of variance. SPSS only extract factors with eigenvalues greater than 1. Hence only, 10 factors were extracted with total variation equal to 65.61%.

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.518	19.026	19.026	2.444	8.428	8.428
2	2.447	8.438	27.464	2.371	8.177	16.605
3	2.099	7.236	34.701	2.263	7.804	24.409
4	1.613	5.563	40.264	2.246	7.744	32.153
5	1.492	5.145	45.409	2.188	7.545	39.698
6	1.361	4.693	50.102	1.782	6.145	45.844
7	1.336	4.608	54.710	1.732	5.973	51.816
8	1.087	3.750	58.459	1.369	4.721	56.538
9	1.065	3.671	62.131	1.342	4.627	61.165
10	1.032	3.558	65.688	1.312	4.524	65.688
11	.954	3.291	68.980			
12	.908	3.131	72.110			
13	.798	2.751	74.862			
14	.763	2.633	77.494			
15	.681	2.349	79.843			
16	.629	2.168	82.011			
17	.610	2.104	84.115			
18	.580	1.998	86.113			
19	.526	1.813	87.926			
20	.505	1.742	89.668			
21	.467	1.609	91.277			
22	.436	1.505	92.782			
23	.428	1.477	94.259			
24	.367	1.264	95.523			
25	.321	1.108	96.631			
26	.301	1.038	97.669			
27	.271	.933	98.601			
28	.226	.779	99.380			
29	.180	.620	100.000			

7.16: Table 7.15: Experts' component matrix

Cumulative Percentage of Variance and Eigenvalue > 1 Rule has been applied. Applying this rule on the experts' data shows that 10 components have eigenvalue greater than 1. The table above shows the eigenvalues associated with each factor (linear component) before extraction and after extraction. Also, the percentage of variance explained by each factor is shown. For example, factor one explains 27.402%. Notice that the first few factors explain relatively larger amount of variance whereas the subsequent factors explain the small amount of variance. SPSS only extract factors with eigenvalues greater than 1. Hence, only, 10 factors were extracted with total variation equals to 65.69%.

7.4.1.3 Rotation

Following Orthogonal Varimax rotation technique, the following table 7.21shows the results for students' data analysis.

Factor	Items	Component
(1)	S4: Student's experience and knowledge about computers T8 Reliable technical infrastructure E6 Sufficiency of the learning materials E7 Course interactivity	.571 .559 .703 .697
(2)	T4: Internet speed T5: Availability of multimedia tools/technologies ST1: Availability of offline technical support ST2: Friendliness of support team ST3: Availability of online help desk	.503 .439 .695 .689 .672
(3)	I2: Instructor ability to motivate the students to use the eLearning system I3: Instructor clarity of explanation of the eLearning components I4: Instructor ability to use the eLearning system effectively	.660 .735 .750
(4)	E1 Ease of registration on e-learning course. E2 Access to the e-learning resources on and off campus E3 The layout and design of information E4 Ease of learning material preparation E5 Language Support	.556 .562 .654 .746 .559
(5)	T1: Easy access to internet T2: Browsing is easy T3: Availability of online communication tools (e.g.-mail)	.743 .686 .629
(6)	E9: Availability of online test/quizzes ST4: Availability of training ST5: Availability of on campus printing facilities	.612 .633 .758
(7)	S1: Students' willingness to participate in e-learning S2: The student's learning style affecting the use of eLearning	.804 .776
(8)	I1: Instructor enthusiasm while teaching using eLearning tools	.850
(9)	S5: The level of student's enjoyment while using technology	.832
(10)	I6: Instructor friendliness in general and while teaching T7: Availability of sufficient computer labs	.418 .800

Table 7.17: shows the results for experts' data analysis.

For experts' factors, the items T5in the 2nd category and I6 in the 10th category should be removed as their loading is less than 0.5. The same goes for the item S5 in the 9th category. Because of these removals, the categories 8, 9 and 10 should also be removed they have only 1 item loaded on them (category 9). Applying these removal results in the following table.

Factor	Items	Component
(1)	S4: Student's experience and knowledge about computers	.571
	T8: Reliable technical infrastructure	.559
	E6 Sufficiency of the learning materials	.703
	E7 Course interactivity	.697
(2)	T4: Internet speed	.503
	ST1: Availability of offline technical support	.695
	ST2: Friendliness of support team	.689
	ST3: Availability of online help desk	.672
(3)	I2: Instructor ability to motivate the students to use the eLearning system	.660
	I3: Instructor clarity of explanation of the eLearning components	.735
	I4: Instructor ability to use the eLearning system effectively	.750
(4)	E1 Ease of registration on e-learning course.	.556
	E2 Access to the e-learning resources on and off campus	.562
	E3 The layout and design of information	.654
	E4 Ease of learning material preparation	.746
	E5 Language Support	.559
(5)	T1: Easy access to internet	.743
	T2: Browsing is easy	.686
	T3: Availability of online communication tools (e.g.-mail)	.629
(6)	E9: Availability of online test/quizzes	.612
	ST4: Availability of training	.633
	ST5: Availability of on campus printing facilities	.758
(7)	S1: Students' willingness to participate in e-learning	.804
	S2: The student's learning style affecting the use of eLearning	.776

Table 7.18: Experts' matrix after removal of low loading items

7.4.1.4 Interpretation

Factor	Items	Component
Experience	S4: Student's experience and knowledge about computers	.571
	T8 Reliable technical infrastructure	.559
	E6 Sufficiency of the learning materials	.703
	E7 Course interactivity	.697
Support and training (1)	ST1: Availability of offline technical support	.695
	ST2: Friendliness of support team	.689
	ST3: Availability of online help desk	672
	T4: Internet speed	.503
Instructor characteristics	I2: Instructor ability to motivate the students to use the eLearning system	.660
	I3: Instructor clarity of explanation of the eLearning components	.735
	I4: Instructor ability to use the eLearning system effectively	.750
System access	E1 Ease of registration on e-learning course.	.556
	E2 Access to the e-learning resources on and off campus	.662
	E3 The layout and design of information	.654
	E4 Ease of learning material preparation	.746
	E5 Language Support	.559
Technology Infrastructure	T1: Easy access to internet	.743
	T2: Browsing is easy	.686
	T3: Availability of online communication tools (e.g.-mail)	.626
Support and training (2)	E9: Availability of online test/quizzes	.612
	ST4: Availability of training	.633
	ST5: Availability of on campus printing facilities	.758
Student characteristics	S1: Students' willingness to participate in e-learning	.804
	S2: The student's learning style affecting the use of eLearning	.776

Table 7.19 Experts new factors

7.4.2 Experts EFA results discussion

In a similar fashion to analysing the academic staff data, this section presents a deeper analysis and interpretation of the results will be presented. However, for clarity, the items loaded on each factor have been ordered based on their loading value (the component column). This is shown in the following table.

Factor	Items	Component
Experience	E6 Sufficiency of the learning materials	.703
	E7 Course interactivity	.697
	S4: Student's experience and knowledge about computers	.571
	T8 Reliable technical infrastructure	.559
Support and training (1)	ST1: Availability of offline technical support	.695
	ST2: Friendliness of support team	.689
	ST3: Availability of online help desk	672
	T4: Internet speed	.503
Instructor characteristics	I4: Instructor ability to use the eLearning system effectively	.750
	I3: Instructor clarity of explanation of the eLearning components	.735
	I2: Instructor ability to motivate the students to use the eLearning system	.660
System access	E4 Ease of learning material preparation	.746
	E2 Access to the e-learning resources on and off campus	.662
	E3 The layout and design of information	.654
	E5 Language Support	.559
	E1 Ease of registration on e-learning course.	.556
Technology Infrastructure	T1: Easy access to internet	.743
	T2: Browsing is easy	.686
	T3: Availability of online communication tools (e.g.-mail)	.626
Support and training (2)	ST5: Availability of on campus printing facilities	.758
	ST4: Availability of training	.633
	E9: Availability of online test/quizzes	.612
Student characteristics	S1: Students' willingness to participate in e-learning	.804
	S2: The student's learning style affecting the use of eLearning	.776

Table 7.20: Expert items ordered by their loading values

As the table above shows, analysing the experts' data has led to the removal of three categories due to the lack of items loaded on them. While the factors have been named to suit their nature, it can be noticeable that experts' data results revealed different factors with similar nature of factors loaded to them. To reflect that, the factors have been named in a sequel (e.g. Support and training 1 and Support and training 2). Furthermore, based on the total Variance Explained as shown in table (7.9) experience is the most important factor according to the experts' point of view. The least important factor is the student characteristics in the seventh rank. Support and training (1)is the second most important factor according to these results. Instructor characteristics, system access, technology Infrastructure, and support and training (2)have been ranked as 3rd, 4th, 5th, and 6th most important factors respectively; All that is according to the experts' point of view. In terms of each factor and the items loaded on it have been ordered by their importance from low to high. That importance has been measured by the item's loading value on the factor.

According to these values, sufficiency of the learning materials is the most important item within those loaded on the basic requirements factor. That is followed by course interactivity, student's experience, and knowledge about computers, and reliable technical infrastructure which is the least important item in the students' characteristics factor. In the second most important factor which is the support and training (1) factor and availability of offline technical support has been ranked as the most important item followed by friendliness of support team, availability of online help desk, and internet speed as least important item loaded to this factor.

Instructor characteristics factor has three factors loaded to it. The most important among these is the instructor ability to use the eLearning system effectively. This is followed by the instructor clarity of explanation of the eLearning components and the instructor ability to motivate the students to use the eLearning system in second and third place.

In the fourth rank is system access factor which has five items loaded to it. The most important item according to the experts' opinion is the ease of learning material preparation, followed by access to the e-learning resources on and off campus, the layout and design of information, language Support, and ease of registration on e-learning course in second, third, fourth, and fifth in the least important position.

Technology Infrastructure was ranked as the fifth most important factor. As the name reflect, this factor focuses on the issues related to the technology used to facilitate the eLearning system. From the items loaded to this factor, easy access to internet was ranked as the most important item, followed by 'browsing is easy' item. In the third and least important place is the availability of online communication tools (e.g.-mail).

In the sixth most important place was the support and training (2) which is another set of items related to the support provided by the academic institution. Availability of on campus printing facilities was the most important item loaded on this factor followed by availability of training and availability of online test/quizzes in the second and third most important places.

The least important factor, as mentioned earlier, was the students' characteristics where students' willingness to participate in e-learning was ranked as most important item loaded to it. This followed by the only other item loaded to this factor which is the student's learning style affecting the use of eLearning in the second and least important place.

7.4.3 Experts Data CFA

Figure A shows the measurement model for experts. The initial results given in the Table (A) showed that the fit indices were good. No items need to dropped at this stage. So, the next step is to examine validity and reliability.

	χ²/df (CMIN/df)	SRMR	CFI	RMSEA	PCLOSE
Initial results	1.242	.072	.915	.043	.739

Table 7.21: fit indices for Experts data

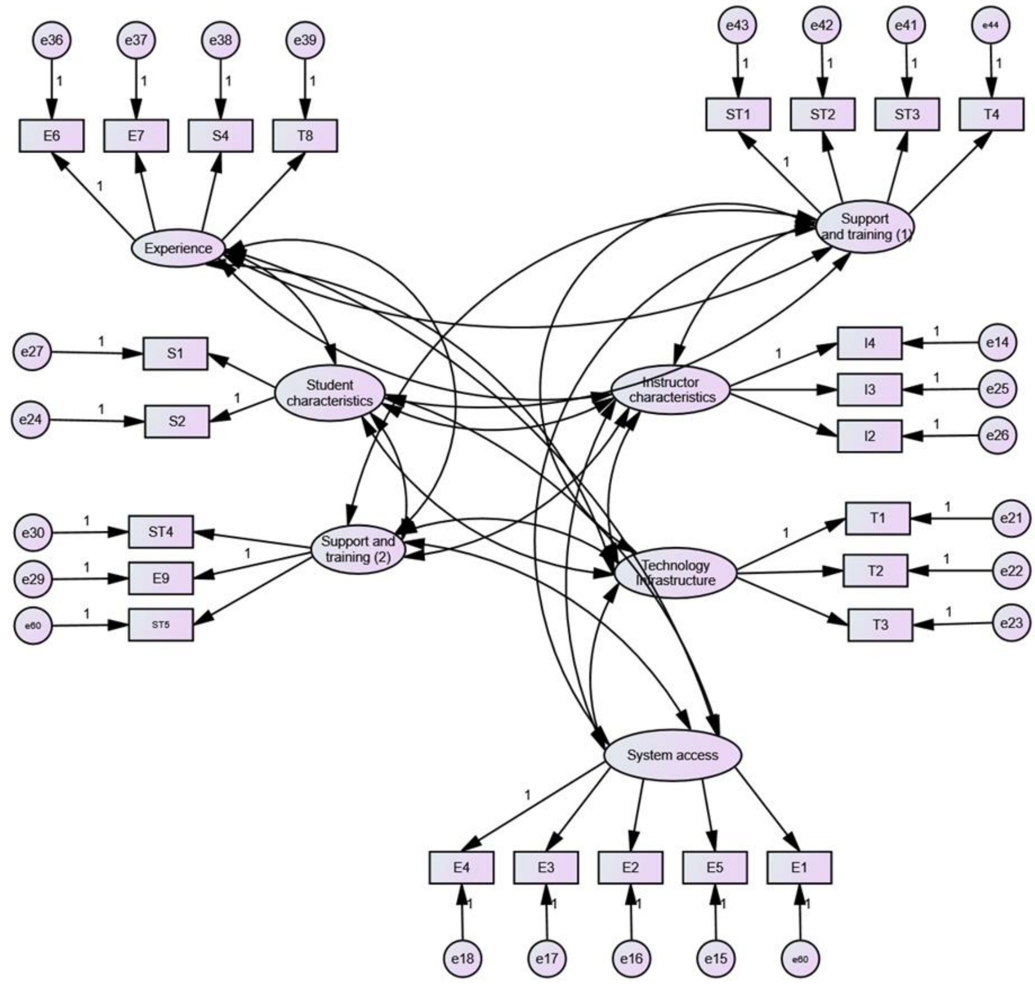

Figure 7.6: measurement models for experts

7.4.3.1 Validity and reliability for experts

Items showed low squared-correlation (<.30) were dropped, see Table 7.28. After drooping weak items showed (T4, ST5, E2, E1, ST2 and S4) squared-correlation became more than or close to .30 see Table 2 and the figure.

Items	Estimate
T4	.221
ST5	.099
ST4	.811
E9	.285
S1	.606
I2	.576
I3	.325
S2	.416
T3	.393
T2	.329
T1	.479
E4	.589
E3	.322
E2	.246
E5	.397
I4	.473
E1	.135
ST3	.657
ST2	.234
ST1	.310
T8	.306
S4	.211
E7	.417
E6	.601

Table 7.22: Squared Multiple Correlations: (Group number 1 - Default model)

Items	Estimate
ST4	.714
E9	.263
S1	.617
I2	.600
I3	.317
S2	.409
T3	.376
T2	.335
T1	.493
E4	.562
E3	.281
E5	.492
I4	.457
ST3	.806
ST1	.245
T8	.254
E7	.394
E6	.687

Table 7.23 Squared Multiple Correlations: (Group number 1 - Default model)

- **Unidimensionality**

In order to ensure unidimensionality of a measurement mode, unidimensionality also requires all factor loadings to be positive and the factor loading for every item should exceed 0.5 (Bin and Afthanorhan, 2014; Segars, 1997; Zainudin, 2010). Table 3 below showed that all the items had positive loading and exceeded 0.5.

Item	Factor	Estimate
E6	Experience	0.829
E7	Experience	0.628
T8	Experience	0.504
ST1	Support and training (1)	0.495
ST3	Support and training (1)	0.898
I4	Instructor characteristics	0.676
E5	System access	0.702
E3	System access	0.530
E4	System access	0.750
T1	Technology Infrastructure	0.702
T2	Technology Infrastructure	0.579
T3	Technology Infrastructure	0.613
S2	Student characteristics	0.639
I3	Instructor characteristics	0.563
I2	Instructor characteristics	0.774
S1	Student characteristics	0.785
E9	Support and training (2)	0.513
ST4	Support and training (2)	0.845

Table 7.24: Standardized Regression Weights: (Group number 1 - Default model)

- **Discriminant Validity**

Discriminant validity is supported if the square root of average variance extracted of each construct is more than its correlation with other constructs (Guo et al., 2011). Table 4 below showed that the results achieved a satisfactory level of discriminant validity.

Factor	**1**	**2**	**3**	**4**	**5**	**6**	**6**
Studentcharacteristics	**0.716**						
Experience	0.187	**0.667**					
Supportandtraining (2)	0.459	0.482	**0.725**				
System access	0.237	0.668	0.509	**0.667**			
Instructorcharacteristics	0.375	0.462	0.411	0.325	**0.677**		
TechnologyInfrastructure	0.345	0.291	0.282	0.250	0.093	**0.633**	
Support and training (1)	0.106	0.583	0.620	0.469	0.284	0.197	**0.699**

Table 7.25: Discriminant Validity for expert

- **Convergent Validity**

The convergent validity could also be verified by computing the Average Variance Extracted (AVE) for every construct. The value of AVE should be 0.5 or higher for Based on the results given in Table below, the AVE was more than 0.5 or very close 0.5 which was accepted.

- **Composite reliability**

A value of CR>= 0.6 is required in order to achieve CR for constructs (Zainudin, 2012). From Table 5 below, the resulting CR was higher than or closer to 0.70 indicating that the constructs of the model are reliable.

- **Cronbach's alpha**

From Table 5, Cronbach's alpha ranged from > 0.60, which indicated that the resulting model reliability was very satisfying.

	CR	**AVE**	**Cronbach's alpha**
Student characteristics	0.675	0.512	.665
Experience	0.698	0.465	.689
Support and training (2)	0.672	0.526	.600
System access	0.702	0.458	.668
Instructor characteristics	0.714	0.458	.712
Technology Infrastructure	0.666	0.471	.654
Support and training (1)	0.643	0.489	.604

Table7.26: Results of CR, AVE and Cronbach's alpha tests

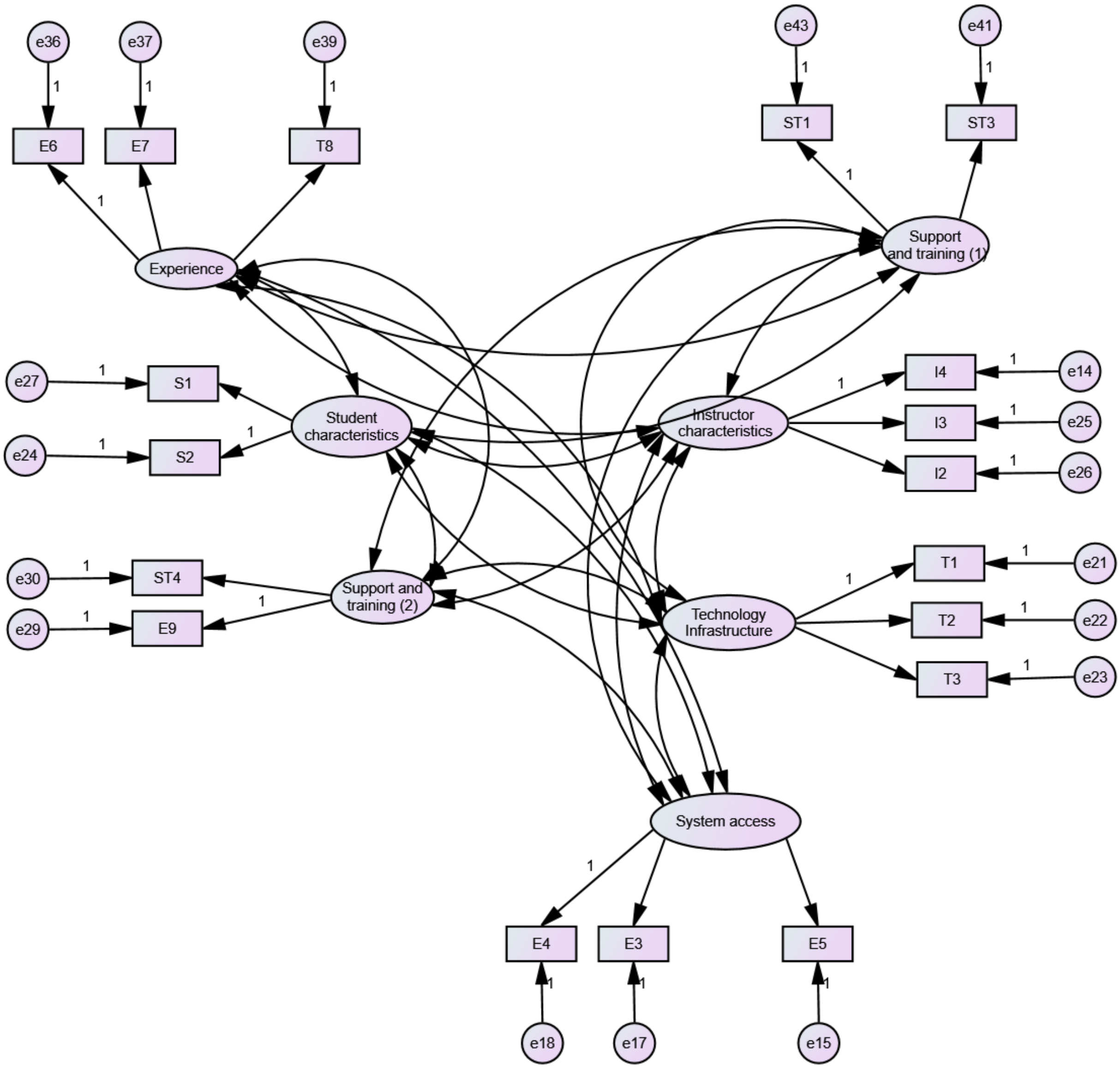

Figure 7.7: Final factors and the items related to them

Table 7.27 below shows the final items and the related items.

Factor	Items
Experience	E6 Sufficiency of the learning materials
	E7 Course interactivity
	T8 Reliable technical infrastructure
Support and training (1)	ST1: Availability of offline technical support
	ST3: Availability of online help desk
Instructor characteristics	I4: Instructor ability to use the eLearning system effectively
	I3: Instructor clarity of explanation of the eLearning components
	I2: Instructor ability to motivate the students to use the eLearning system
System access	E4: Ease of learning material preparation
	E3: The layout and design of information
	E5: Language Support
Technology Infrastructure	T1: Easy access to internet
	T2: Browsing is easy
	T3: Availability of online communication tools (e.g.-mail)
Support and training (2)	ST4: Availability of training
	E9: Availability of online test/quizzes
Student characteristics	S1: Students' willingness to participate in e-learning
	S2: The student's learning style affecting the use of eLearning

Table 7.27: Final factors and the items related to them.

As the table shows, the final factors have been maintained from those resulted from the EFA analysis; however, some items were removed after performing all tests as described above. In specific, the 'S4: Student's experience and knowledge about computers' has been removed from 'Students characteristics' factor. The same case for 'ST2: Friendliness of support team' and 'T4: Internet speed' from 'Support and training 1' factor, 'E2: Access to the e-learning resources on and off campus' and 'E1 Ease of registration on e-learning course' item from eLearning systems and online learning resources'. From Technology infra-structure, the item ST5: Availability of on campus printing facilities was also removed.

7.5 Students Data Analysis

The same steps followed to perform academic staff data analysis have also been performed on students' data. The following subsections presents the results of these steps.

7.5.1 Student Data EFA

7.5.1.1 Students' Data Suitability for EFA

Data suitability tests aim at checking the suitability of the collected data to undergo an EFA analysis. As with academic staff data, different measures were used to check that suitability including the size of the sample to be greater than 100 and the KMO measure to be greater than 0.50. Following the sample size indicator, the student sample falls in the good range as the total number of participants has reached about 350 students. Moreover, following the KMO measure, the students' data has scored 0.886. The other test that was adopted as a pre-check with academic staff sample before extracting factors from the analysed data is the Bartlett's Test of Sphericity. The Bartlett's Test of Sphericity should be significant ($p<.05$) for factor analysis to be suitable. For the students' sample, the value for the significant was 0.000, which makes the data collected from both samples suitable for EFA analysis. The following table shows these test results.

KMO and Bartlett's Test/Students		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.886
Bartlett's Test of Sphericity	Approx. Chi-Square	4737.845
	Df	666
	Sig.	0.000

Table 7.28 KMO and Bartlett's Test for students' data

7.5.1.2 Factor extraction

The second step is to extract variables which are considered more important or more influential than others in the initial list of variables. PCA was used with the academic staff data and it will also be used here. The analysis of the students' data has shown some differences from those of academic staff. Looking table 11, the remaining factors are seven. In the interpretation step, the number 1-7 which represented collection of items loaded to some certain factors have been replaced to reflect the nature of these items.

Component	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.13	27.40	27.40	10.13	27.40	27.402	3.414	9.227	9.227
2	2.848	7.697	35.100	2.848	7.697	35.100	3.364	9.091	18.318
3	1.940	5.244	40.343	1.940	5.244	40.343	3.333	9.007	27.325
4	1.822	4.925	45.269	1.822	4.925	45.269	3.109	8.403	35.728
5	1.479	3.998	49.267	1.479	3.998	49.267	2.550	6.892	42.620
6	1.292	3.492	52.758	1.292	3.492	52.758	2.255	6.093	48.713
7	1.124	3.038	55.796	1.124	3.038	55.796	1.939	5.241	53.954
8	1.075	2.907	58.703	1.075	2.907	58.703	1.411	3.813	57.766
9	1.023	2.766	61.469	1.023	2.766	61.469	1.370	3.703	61.469
10	.935	2.527	63.996						
11	.840	2.270	66.266						
12	.788	2.130	68.396						
13	.781	2.110	70.506						
14	.757	2.045	72.551						
15	.708	1.914	74.465						
16	.675	1.824	76.289						
17	.628	1.698	77.987						
18	.616	1.665	79.652						
19	.584	1.577	81.229						
20	.573	1.549	82.778						
21	.547	1.479	84.257						
22	.538	1.455	85.712						
23	.500	1.352	87.064						
24	.490	1.325	88.389						
25	.446	1.206	89.595						
26	.438	1.183	90.777						
27	.423	1.144	91.921						
28	.408	1.103	93.024						
29	.359	.970	93.995						
30	.337	.911	94.905						
31	.322	.869	95.774						
32	.311	.841	96.615						
33	.297	.802	97.418						
34	.267	.723	98.140						
35	.255	.690	98.830						
36	.227	.614	99.444						
37	.206	.556	100.000						
Extraction Method: Principal Component Analysis.									

Table 7.29: Students' component matrix

Cumulative Percentage of Variance and Eigenvalue > 1 Rule has been applied. Applying this rule on the students' data shows that also 9 components have eigenvalue greater than 1. The table lists the eigenvalues associated with each factor (linear component) before extraction and after extraction. Also, the percentage of variance explained by each factor is shown. For example, factor one explains 27.402%. Notice that the first few factors explain relatively larger amount of variance whereas the subsequent factors explain the small amount of variance. SPSS only extract factors with eigenvalues greater than 1. Hence, only, 9 factors were extracted with total variation equals to 61.469%.

7.5.1.3 Rotation

Following Orthogonal Varimax rotation technique, table 7.30 below shows the results for students' data analysis.

Factor	Items	Component
(1)	T1 Easy access to internet	.711
	T2 Browsing is easy	.789
	T3. Availability of online communication tools (e.g.-mail)	.684
	T4 Internet speed	.450
	T5 Availability of multimedia tools/technologies	.476
	T7 Availability of sufficient computer labs	.642
	T8. Reliable technical infrastructure	.527
(2)	I1. Instructor's enthusiasm while teaching using eLearning tools	.751
	I2. Instructor's ability to motivate the students to use the eLearning system	.740
	I3 The clarity of instructor's explanation of the eLearning components	.718
	I4 Instructor's ability to use the e-Learning system effectively	.739
	I5 Instructor's style of teaching using eLearning technologies	.674
(3)	S1 My willingness to participate in e-learning	.635
	S2 My learning style is affecting my use of eLearning	.637
	S3 My ability to find things in eLearning system	.700
	S4 My experience and knowledge about computers	.661
	S5 The level of my enjoyment while using technology	.659
	S6 My understanding of the purpose of different parts of the eLearning system	.664
(4)	E6 Course interactivity	.602
	E7 Availability of communications with the instructor in the eLearning system	.636
	E8 Availability of online test/quizzes.	.729
	E9 Option to return to unfinished tasks	.480
	E10 . Measurement of learning progress	.532
	E11 Whether the learning material is up-to-date.	.507
(5)	ST1 Availability of offline technical support	.670
	ST2 Friendliness of support team	.523
	ST3 Availability of online help desk	.679
	ST4 Availability of training	.722
(6)	E1 Ease of registration on e-learning course	.715
	E2 Access to the e-learning resources on and off campus	.688
(7)	T6 Ability to search for learning material using the website	.536
	E4 Language Support	.702
	E5 Sufficiency of the learning materials	.478
(8)	I7 Instructor's ability to motivate students to get engaged in online discussions	.421
	E3 The layout and design of information	.465
(9)	I6 Instructor's friendliness in general and while teaching.	.770
	ST5 Availability of on campus printing facilities	.453

Table 7.30: students rotated matrix

For students, the items I7 and E3 should be removed as their loading is less than 0.5. The same goes for the item ST5 in the 9th category. Because of these removals, the categories 8 and 9 should also be removed as they either have no items loaded on them (category 8) or they have only 1 item loaded on them (category 9). Applying these techniques and rules produces the following two tables.

Factor	Items	Component
(1)	T1 Easy access to internet	.711
	T2 Browsing is easy	.789
	T3 Availability of online communication tools (e.g.-mail)	.684
	T7 Availability of sufficient computer labs	.642
	T8 Reliable technical infrastructure	.527
(2)	I1 Instructor's enthusiasm while teaching using eLearning tools	.751
	I2 Instructor's ability to motivate the students to use the eLearning system	.740
	I3 The clarity of instructor's explanation of the eLearning components	.718
	I4 Instructor's ability to use the eLearning system effectively	.739
	I5 Instructor's style of teaching using eLearning technologies	.674
(3)	S1 My willingness to participate in e-learning	.635
	S2 My learning style is affecting my use of eLearning	.637
	S3 My ability to find things in eLearning system	.700
	S4 My experience and knowledge about computers	.661
	S5 The level of my enjoyment while using technology	.659
	S6 My understanding of the purpose of different parts of the eLearning system	.664
(4)	E6 Course interactivity	.602
	E7 Availability of communications with the instructor in the eLearning system	.636
	E8 Availability of online test/quizzes.	.729
	E10 Measurement of learning progress	.532
	E11 Whether the learning material is up-to-date.	.507
(5)	ST1 Availability of offline technical support	.670
	ST2 Friendliness of support team	.523
	ST3 Availability of online help desk	.679
	ST4 Availability of training	.722
(6)	E1 Ease of registration on e-learning course	.715
	E2 Access to the e-learning resources on and off campus	.688
(7)	T6 Ability to search for learning material using the website	.536
	E4 Language Support	.702

Table 7.31: Students' matrix after removal of low loading items

7.5.1.4 Interpretation

Factor	Items	Component
Technology Infrastructure	T1: Easy access to internet T2: Browsing is easy T3: Availability of online communication tools (e.g.-mail) T7: Availability of sufficient computer labs T8: Reliable technical infrastructure	.711 .789 .684 .642 .527
Instructor characteristics	I1 Instructor's enthusiasm while teaching using eLearning tools I2 Instructor's ability to motivate the students to use the eLearning system I3: The clarity of instructor's explanation of the eLearning components I4 Instructor's ability to use the eLearning system effectively I5 Instructor's style of teaching using eLearning technologies	.751 .740 .718 .739 .674
Student characteristics	S1 My willingness to participate in e-learning S2 My learning style is affecting my use of eLearning S3 My ability to find things in eLearning system S4 My experience and knowledge about computers S5 The level of my enjoyment while using technology S6 My understanding of the purpose of different parts of the eLearning system	.635 .637 .700 .661 .659 .664
e-Learning sources	E6 Course interactivity E7 Availability of communications with the instructor in the eLearning system E8 Availability of online test/quizzes. E10 Measurement of learning progress E11 Whether the learning material is up-to-date.	.602 .636 .729 .532 .507
Support and training	ST1 Availability of offline technical support ST2 Friendliness of support team ST3 Availability of online help desk ST4 Availability of training	.670 .523 .679 .722
System access	E1 Ease of registration on e-learning course E2 Access to the e-learning resources on and off campus	.715 .688
Searching support	T6 Ability to search for learning material using the website E4 Language Support	.536 .702

Table 7.32 Students' new factors

7.5.2 Students Analysis Results Discussion

The analysis of the students' data has shown some differences from those of academic staff and experts'. Looking table 7.31, the remaining factors are seven. In the interpretation step, the number 1-7 which represented collection of items loaded to certain factors have been replaced to reflect the nature of these items. These factors and the loaded items are reordered in the following table based on the loading value of each item to its relevant factor.

Factor	Items	Component
Technology Infrastructure	T2 Browsing is easy	0.789
	T1 Easy access to internet	0.711
	T3 Availability of online communication tools (e.g.-mail)	0.684
	T7 Availability of sufficient computer labs	0.642
	T8 Reliable technical infrastructure	0.527
Instructor characteristics	I1 Instructor's enthusiasm while teaching using eLearning tools	0.751
	I2 Instructor's ability to motivate the students to use the eLearning system	0.740
	I4 Instructor's ability to use the eLearning system effectively	0.739
	I3 The clarity of instructor's explanation of the eLearning components	0.718
	I5 Instructor's style of teaching using eLearning technologies	0.674
Student characteristics	S3 My ability to find things in eLearning system	0.700
	S6 My understanding of the purpose of different parts of the eLearning system	0.664
	S4 My experience and knowledge about computers	0.661
	S5 The level of my enjoyment while using technology	0.659
	S2 My learning style is affecting my use of eLearning	0.637
	S1 My willingness to participate in e-learning	0.635
eLearning sources	E8 Availability of online test/quizzes.	0.729
	E7 Availability of communications with the instructor in the eLearning system	0.636
	E6 Course interactivity	0.602
	E10 Measurement of learning progress	0.532
	E11 Whether the learning material is up-to-date.	0.507
Support and training	ST4 Availability of training	0.722
	ST3 Availability of online help desk	0.679
	ST1 Availability of offline technical support	0.670
	ST2 Friendliness of support team	0.523
system access	E1 Ease of registration on e-learning course	0.715
	E2 Access to the e-learning resources on and off campus	0.688
Searching support	E4 Language Support	0.702
	T6 Ability to search for learning material using the website	0.536

Table 7.33 Students items ordered by their loading values

Following the same technique used with the academic staff data, the items loaded on it, the items loaded on each factor have been ordered by their importance from low to high. That importance has been measured by the item's loading value on the factor. The results of applying this technique is shown in table. Relying on this technique, among the items loaded to the technology infrastructure factor, browsing is easy is the most important item. The second most important item was the easy access to internet; availability of online communication tools (e.g.-mail), availability of sufficient computer labs, and reliable technical infrastructure were ranked as the 3rd, 4th and 5th most important items loaded to the technology Infrastructure factor.

Instructor’s enthusiasm while teaching using eLearning tools has been ranked as the most important item loaded to the second most important factors which is the Instructor characteristics. The Instructor’s ability to motivate the students to use the eLearning system item was placed as 2nd most important items while the instructor’s ability to use the eLearning system effectively was placed as a 3rd most important item. This was followed the clarity of instructor’s explanation of the eLearning components in 4th place in terms of importance. The least important item among those loaded to the instructor’s characteristics was Instructor’s style of teaching using eLearning technologies.

Students have placed their characteristics in the third place among the 7 remaining factors. In term of the importance of the specific items loaded to this factor, the student’s ability to find things in eLearning system, has been ranked as the most important item. This is followed by the students’ understanding of the purpose of different parts of the eLearning system, their experience and knowledge about computers, the level of my enjoyment while they use technology, and the students learning style is affecting my use of eLearning as 2nd, 3rd, 4th, and 5th most important factors. The least important item loaded to this factor was my willingness to participate in e-learning, according to the students’ data analysis results.

eLearning sources was ranked as the fourth most important factor among the 7 final factors. Availability of online test/quizzes was ranked as the most important item. This was followed by the availability of communications with the instructor in the eLearning system in 2nd place; course interactivity in the 3rd place; Measurement of learning progress in the 4th place; and the least important item loaded to this factor was whether the learning material is up-to-date.

The students have ranked support and training as the fifth most important factor. As the name of this factor reflects, the items loaded to this factor focus on the support and training. The five items, which are loaded to this factor, were ranked as availability of training components to be the most important, followed by the Availability of online help desk. Availability of offline technical support was ranked as the third most important items. Friendliness of support team was ranked as fourth and least important items loaded to this factor respectively.

The system access has been ranked as the sixth most important factor. This factor and the items loaded to it can be related to other factors; specifically, to the eLearning system resources factor and searching support factor. Two items were loaded to this factor and they were ranked, as ease of registration on e-learning course to be the most important item, followed by the access to the e-learning resources on and off campus and it's the least important items loaded to this factor.

Searching support was ranked as the seventh most important factor by students; thus, the least important factor among the 7 remaining factors. This factor focuses on issues and items related to the availability of the searching support on how to use the eLearning system. Language Support was ranked as most important item loaded to this factor while the second and less important item loaded to this factor is the Ability to search for learning material using the website.

7.5.3 Students Data CFA

Figure A shows the measurement model for students. The initial results given in the Table C shows that the fit indices are somewhat poor. Using model refinement criteria, four items were deleted (t7, t8, st2, i4). As a result, the fit indices reached the acceptable levels, see Table 7.33.

	χ^2/df (CMIN/df)	**SRMR**	**CFI**	**RMSEA**	**PCLOSE**
Initial results	2.191	0512	.876	.058	.009
After deleting: t7, t8, st2, i4	1.707	.0447	.936	.045	.860

Table 7.34: fit indices for students

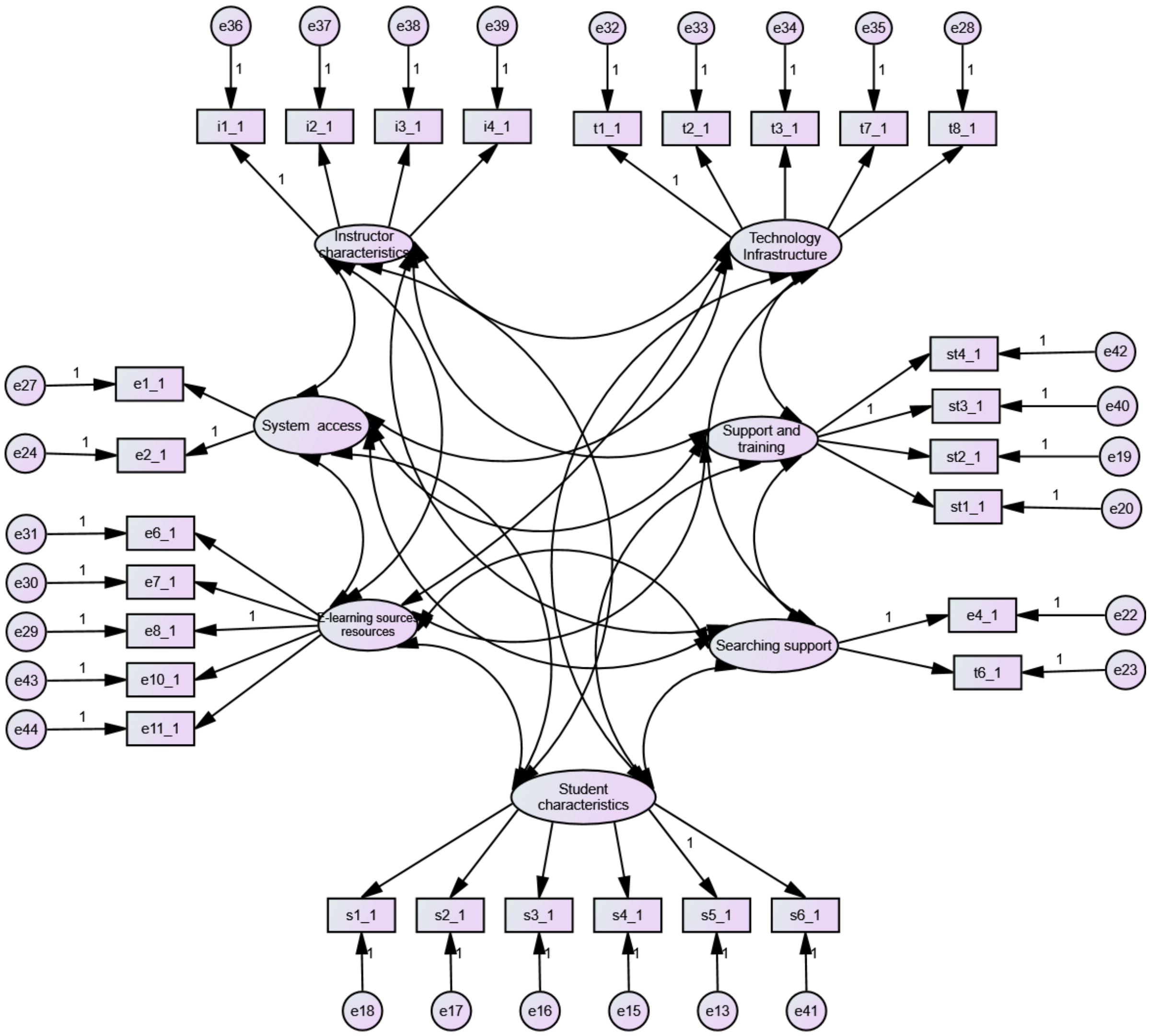

Figure 7.8: measurement model for students

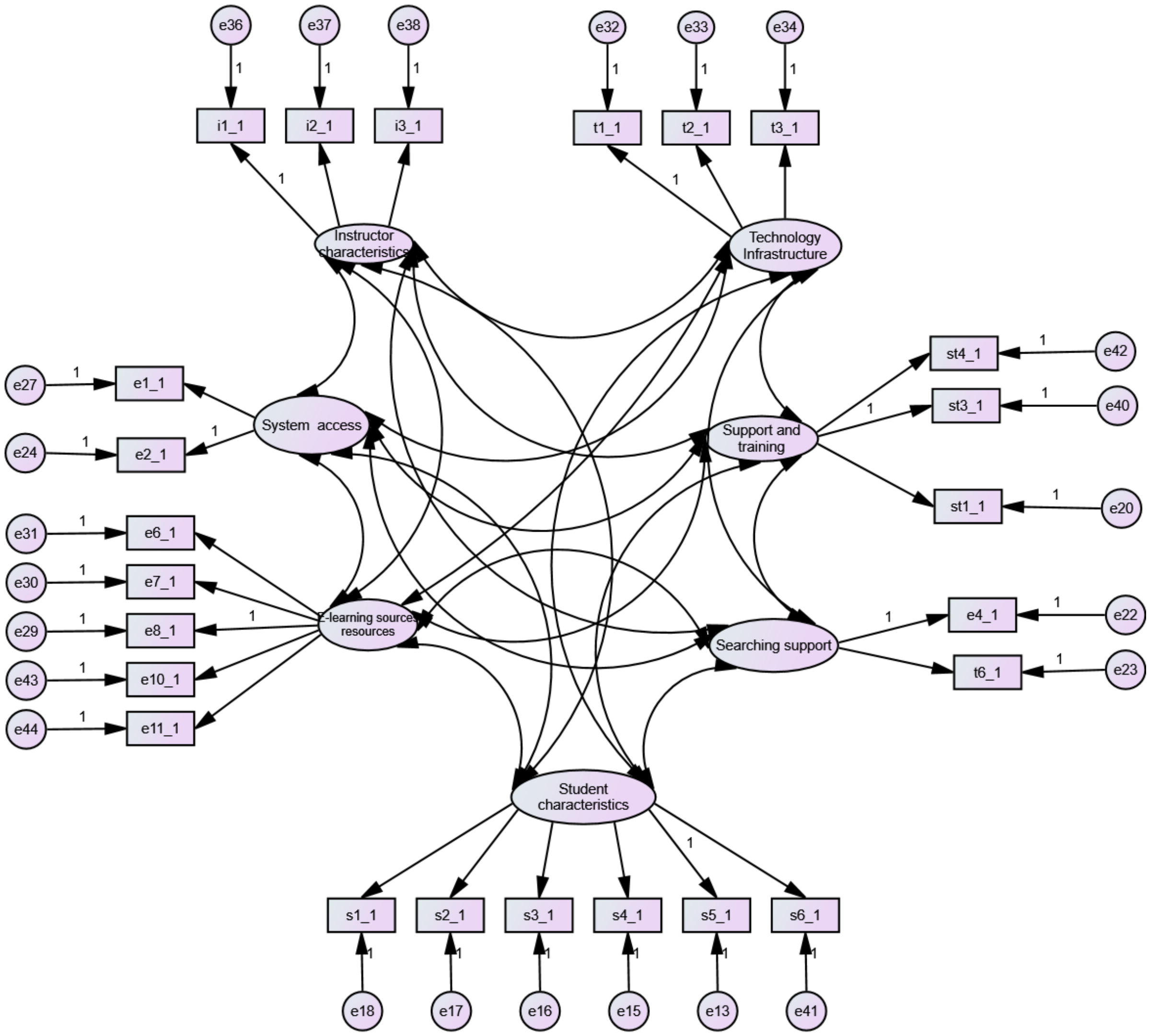

Figure 7.9: measurement model for students after improving

7.5.3.1 Validity and reliability for students

Item	Estimate
e11_1	0.352
e10_1	0.503
st4_1	0.416
s6_1	0.452
e6_1	0.428
e7_1	0.462
e8_1	0.407
e1_1	0.569
e2_1	0.476
t6_1	0.352
e4_1	0.273
st1_1	0.457
s1_1	0.405
s2_1	0.299
s3_1	0.490
s4_1	0.338
s5_1	0.410
i3_1	0.423
i2_1	0.714
st3_1	0.496
i1_1	0.473
t3_1	0.514
t2_1	0.546
t1_1	0.462

Table 7.35: Squared Multiple Correlations: (Group number 1 - Default model)

Searching support	E4 Language Support	0.70
	T6 Ability to search for learning material using the website	0.53
Students' characteristics	S3 My ability to find things in eLearning system	0.70
	S6 My understanding of the purpose of different parts of the eLearning system	0.66
	S4 My experience and knowledge about computers	0.66
	S5 The level of my enjoyment while using technology	0.66
	S2 My learning style is affecting my use of eLearning	0.63
	S1 My willingness to participate in e-learning	0.63

Table 7.36 Factors were dropped.

E4 showed low squared-correlation (0.273) and hence it was dropped. As a result, searching support factor was dropped since one item cannot represent a factor. For student characteristics, S2 showed low squared-correlation (0.299) and hence it was dropped. Then, the analysis was repeated. The table below showed that all items has squared-correlation higher than 0.30.

Item	Estimate
e11_1	.356
e10_1	.507
st4_1	.412
s6_1	.517
e6_1	.424
e7_1	.457
e8_1	.408
e1_1	.574
e2_1	.472
st1_1	.467
s1_1	.378
s3_1	.456
s4_1	.331
s5_1	.419
i3_1	.421
i2_1	.717
st3_1	.490
i1_1	.473
t3_1	.525
t2_1	.531
t1_1	.463

Table 7.37: Squared Multiple Correlations: (Group number 1 - Default model)

- **Unidimensionality**

In order to ensure unidimensionality of a measurement mode, unidimensionality also requires all factor loadings to be positive and the factor loading for every item should exceed 0.5 (Bin and Afthanorhan, 2014; Segars, 1997; Zainudin, 2010). The table below showed that all the items had positive loading and exceeded 0.5.

	Factor	Estimate
t1_1	Technology infra-structure	.681
t2_1	Technology infra-structure	.729
t3_1	Technology infra-structure	.725
i1_1	Instructor characteristics	.688
st3_1	Support and training	.700
i2_1	Instructor characteristics	.847
i3_1	Instructor characteristics	.649
s5_1	Student characteristics	.648
s4_1	Student characteristics	.576
s3_1	Student characteristics	.675
s1_1	Student characteristics	.615
st1_1	Support and training	.683
e2_1	System access	.687
e1_1	System access	.758
e8_1	e-Learning sources	.639
e7_1	e-Learning sources	.676
e6_1	e-Learning sources	.651
s6_1	Student characteristics	.719
st4_1	Support and training	.642
e10_1	e-Learning sources	.712
e11_1	e-Learning sources	.597

Table 7.38 Standardized Regression Weights: (Group number 1 - Default model)

- **Discriminant Validity**

Discriminant validity is supported if the square root of average variance extracted of each construct is more than its correlation with other constructs (Guo et al., 2011). The table below showed that the results achieved a satisfactory level of discriminant validity.

Factors	1	2	3	4	5	6
System access	**0.763**					
Technology Infrastructure	0.374	**0.712**				
Instructor characteristics	0.369	0.271	**0.733**			
Support and training	0.624	0.439	0.348	**0.675**		
Student characteristics	0.425	0.287	0.446	0.433	**0.648**	
e-Learning sources	0.734	0.428	0.458	0.668	0.575	**0.656**

Table 7.39 the results achieved a satisfactory level of discriminant validity.

- **Convergent Validity**

The convergent validity could also be verified by computing the Average Variance Extracted (AVE) for every construct. The value of AVE should be 0.5 or higher for this validity to achieve (Holmes-Smith, 2011). Based on the results given in the table below, the AVE was more than 0.5 or very close 0.5 which was accepted. A value of CR>= 0.6 is required in order to achieve

CR for constructs (Zainudin, 2012). From the table below, the resulting CR was higher than or closer to 0.70 indicating that the constructs of the model are reliable.

- **Cronbach's alpha**

From the table, Cronbach's alpha ranged from > 0.60, which indicated that the resulting model reliability was very satisfying.

Factors	**CR**	**AVE**	**Cronbach's alpha**
System access	0.687	0.523	0.684
Technology Infrastructure	0.755	0.507	0.745
Instructor characteristics	0.775	0.537	0.764
Support and training	0.715	0.477	0.714
Student characteristics	0.783	0.480	0.780
e-Learning sources	0.790	0.478	0.820

Table7.40: showed that the results achieved a satisfactory level ofCR, AVE and Cronbach's alpha.

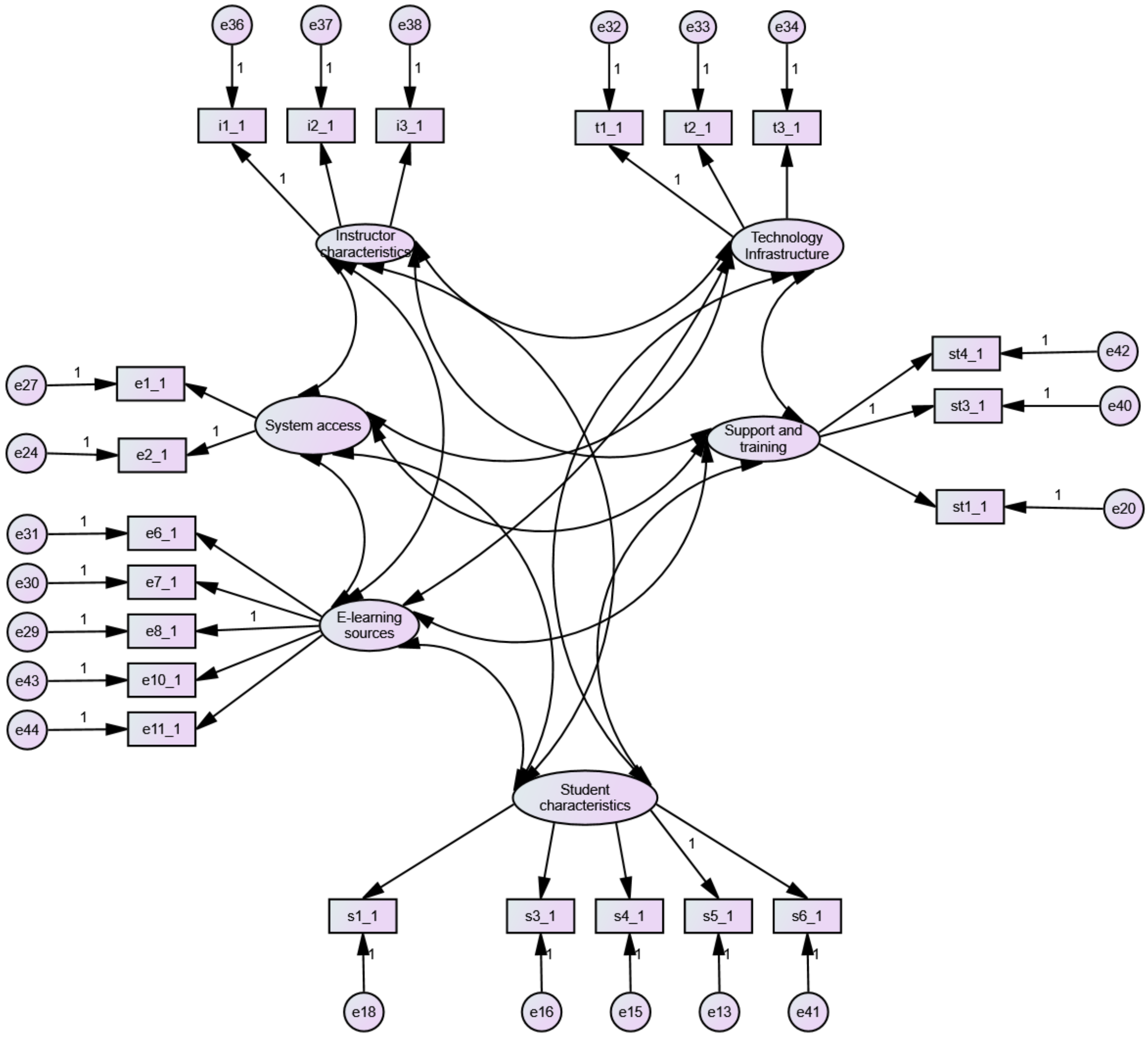

Figure 7.10 final factors and the items related to them

Factor	Items
Technology Infrastructure	T2: Browsing is easy
	T1: Easy access to internet
	T3: Availability of online communication tools (e.g.-mail)
Instructor characteristics	I1: Instructor’s enthusiasm while teaching using eLearning tools
	I2: Instructor’s ability to motivate the students to use the eLearning system
	I3: The clarity of instructor’s explanation of the eLearning components
Student characteristics	S3: My ability to find things in eLearning system
	S6: My understanding of the purpose of different parts of the eLearning system
	S4: My experience and knowledge about computers
	S5: The level of my enjoyment while using technology
	S1: My willingness to participate in e-learning
e-Learning sources	E8: Availability of online test/quizzes.
	E7: Availability of communications with the instructor in the eLearning system
	E6: Course interactivity
	E10: Measurement of learning progress
	E11: Whether the learning material is up-to-date.
Support and training	ST4: Availability of training
	ST3: Availability of online help desk
	ST1: Availability of offline technical support
System access	E1: Ease of registration on e-learning course
	E2: Access to the e-learning resources on and off campus

Table 7.41 final factors and the items related to them.

Similar to the results of academic staff and experts, the students’ factors have been modified after performing CFA tests. The technology infrastructure factor lost two of its items and they are ‘T7: Availability of sufficient computer labs’ and ‘T8: Reliable technical infrastructure’. The instructor characteristics factors lost ‘I4 Instructor’s ability to use the e-Learning system effectively’ and ‘I5 Instructor’s style of teaching using eLearning technologies’. Students characteristics factor has lost ‘S6: My understanding of the purpose of different parts of the eLearning system’ and ‘S2: My learning style is affecting my use of eLearning’. eLearning sources items have passed all the tests and the factor maintained its loaded factors. Support and training factors lost only one item and it is ‘ST2: Friendliness of support team’. System access factor also maintained all its items. However, searching support factor was removed as its loaded items failed the CFA tests.

7.6. Data Analysis Comparison

The previous sections have presented the application of EFA and CFA on data collected from samples of academic staff, experts, and students in King Saud University. While the starting questionnaires were largely similar in terms of factors and the items associated with them, the analysis results have shown differences in the perception of these three groups in terms of how they view eLearning systems and what factors affect these systems more and the items associated with these factors.

According to the final EFA results, the first noticeable difference is the number of factors is each of the three samples consider as impactful on the success of the e-learning system in the university. While according to the academic staff data, there are 9 different factors have high influence on the success of the eLearning system in King Saud University the most, experts and students' data showed that only 7 factors have high influence on the system's success.

Comparing these three sets of factors shows that there are five factors which are mutual between the three sets of data and they are students' characteristics, instructors' characteristics, support and training, technology infrastructure, and system access. However, being mutual among the three sets of data does not mean they are identical as the items loaded to these factors are slightly differ. Moreover, the importance of these factors differs between the three sets of data. The following table summarises these mutual factors among the three samples results.

Factor	Academic Staff	Experts	Students
Student characteristics	**Order of importance: 1**	**Order of importance: 7**	**Order of importance: 3**
	S3: The student's ability to find things in eLearning system	S1: Students' willingness to participate in e-learning	S3 My ability to find things in eLearning system
	S4 Student's experience and knowledge about computers	S2: The student's learning style affecting the use of eLearning	S6 My understanding of the purpose of different parts of the eLearning system
	S2: The student's learning style affecting the use of eLearning		S4 My experience and knowledge about computers
	S1: Students' willingness to participate in e-learning		S5 The level of my enjoyment while using technology
	S6: The student's understanding of the purpose		S2 My learning style is affecting my use of eLearning
			S1: My willingness to participate in e-learning
Instructor characteristic	**Order of importance: 5**	**Order of importance: 3**	**Order of importance: 2**
	I3 The clarity of my explanation of the eLearning components	I4: Instructor ability to use the eLearning system	I1 Instructor's enthusiasm while teaching using eLearning tools
	I2 My ability to motivate the students to use the eLearning system	I3: Instructor clarity of explanation of the eLearning components	I2 Instructor's ability to motivate the students to use the eLearning system
	I1 My enthusiasm while teaching using eLearning tools	I2: Instructor ability to motivate the students to use the eLearning	I4 Instructor's ability to use the eLearning system effectively
	I5 My style of teaching using eLearning technologies		I3 The clarity of instructor's explanation of the eLearning
	I4 My ability to use the eLearning system effectively		I5 Instructor's style of teaching using eLearning technologies
Technology Infrastructure	**Order of importance: 4**	**Order of importance: 5**	**Order of importance: 1**
	T1 Easy access to internet	T1: Easy access to internet	T2 Browsing is easy
	T2 Browsing is easy	T2: Browsing is easy	T1 Easy access to internet
	T3 Availability of online communication tools	T3: Availability of online communication tools	T3 Availability of online communication tools
			T7 Availability of computer labs
			T8 Reliable technical infrastructure
System Access	**Order of importance: 6**	**Order of importance: 4**	**Order of importance: 6**
	E1 Ease of registration on e-learning course.	E4 Ease of learning material preparation	E1 Ease of registration on e-learning course
	E2 Access to the e-learning resources on and off campus	E2 Access to the e-learning resources on and off campus	E2 Access to the e-learning resources on and off campus
	E3 The layout and design of information	E3 The layout and design of information	
		E5 Language Support	
		E1 Ease of registration on e-learning	
Support and training	**Order of importance: 5**	**Order of importance: 2**	**Order of importance: 5**
	ST3 Availability of online help desk	ST1: Availability of offline technical support	ST4 Availability of training
	ST2 Friendliness of support team	ST2: Friendliness of support team	ST3 Availability of online help desk
	ST4 Availability of training	ST3: Availability of online help desk	ST1 Availability of offline technical support
		T4: Internet speed	ST2 Friendliness of support team

Table 7.42: Mutual EFA factors and their loaded items

Starting by students' characteristics, as the table shows, in the academic staff results, it has five items loaded to it and placed in the most important place of impact on the success of the eLearning system. However, according to the experts' data, two items only are loaded to the students' characteristics and placed in the seventh place (the least) of importance. The students were different from both academic staff and experts as they placed it in the third place of impact importance, however, the largest number of items (6 items) were loaded to this factor according to the students EFA results.

Instructors' characteristics, which is the second mutual factor between the three sets of results has five items loaded to it according to the academic staff data analysis results and was placed in the fifth most important rank in terms of its impact on the success of the e-Learning system. The experts EFA results, however, shows that experts have placed it in the third most important place and loaded three items only to it. The students gave instructors characteristics the most importance among the three sample when they placed it in the second place and loaded five items to it.

The third mutual factor is the technology infrastructure and it was placed as the fourth most important factor among the final seven factors and it hasthree items loaded to it according to the academic staff EFA results. Experts gave technology infrastructure a lower ranking when they placed it in the firth most important factor position; Similar to the academic staff results, it has the same three items loaded to it. The student results were also different in regards to technology infrastructure as they placed it in the most important place and the results shows that four items loaded to it. It can be noticed that the first three items (T1, T2, and T3) are loaded to the technology infrastructure factor in all samples' results.

The fourth mutual factors in all samples' results is system access. The results show that academic staff have placed this factor in the sixth place and three items were loaded to it. Experts on the other hand have placed this factor in the fifth place and five items were loaded to it. Finally, students have given the sixth rank to this factor and only to item were loaded to it according to their data EFA results.

The last mutual factor between the three samples data EFA results is support and training which was placed in a lower rank by all the samples. The academic staff have placed this factor in the fifth place; Three items are loaded to it. Experts have placed it in the second place and four items are loaded to it. And lastly, students placed it in the fifth place and four items are loaded to it.

In term of the exact items, it can be noticed that academic staff and experts gave the most importance to the students' characteristics and their ability and willingness to participate, use, and learn using the earning system, the students on the other hand focus of the technology as most important and critical. It is also important to notice that experts have focused on students' characteristics when they placed the student's learning style affecting the use of eLearning as second most important item among all suggested items.

Technology and its abilities were not ignored by the academic staff and they placed it second in the table above. It is interesting to notice that despite the differences in the actual items loaded to the technology related factors, the groups of respondents placed it as a high important part of the eLearning systems that affects it success. On the other hand, the experts have decided to select a mix of items which is referred to as experience factor to be the most important factor among all seven in the results. It is also interesting to notice that the students and academic staff groups of respondents have placed the training and support at lower levels of importance, even if not the lowest. This could be credited to the widespread of technologies nowadays therefore; most users are 'tech-savvy' before even using the eLearning system.

In terms of CFA results, the following table summarises the main common factors and items among all the CFA results.

Factor	Academic Staff	Experts	Students
Student characteristics	S3: My ability to find things in eLearning system	S1: Students' willingness to participate in e-learning	S3: The student's ability to find things in eLearning system
	S6: My understanding of the purpose of different parts of the eLearning system	S2: The student's learning style affecting the use of eLearning	S4: Student's experience and knowledge about computers
	S4: My experience and knowledge about computers		S6: The student's understanding of the purpose
			S5: The level of my enjoyment while using technology
			S1: My willingness to participate in e-learning
Instructor characteristic	I1: Instructor's enthusiasm while teaching using eLearning tools	I4: Instructor ability to use the eLearning system effectively	I1 Instructor's enthusiasm while teaching using eLearning tools
	I2: Instructor's ability to motivate the students to use the eLearning system	I3: Instructor clarity of explanation of the eLearning components	I2 Instructor's ability to motivate the students to use the eLearning system
	I3: The clarity of instructor's explanation of the eLearning components	I2: Instructor ability to motivate the students to use the eLearning system	I3The clarity of instructor's explanation of the eLearning components
	I5 Instructor's style of teaching using eLearning technologies		
Technology Infrastructure	T1 Easy access to internet	T1: Easy access to internet	T2 Browsing is easy
	T2 Browsing is easy	T2: Browsing is easy	T1 Easy access to internet
	T3 Availability of online communication tools	T3: Availability of online communication tools	T3 Availability of online communication tools
System Access	E1 Ease of registration on e-learning course.	E4 Ease of learning material preparation	E1 Ease of registration on e-learning course.
	E2 Access to the e-learning resources on and off campus	E3 The layout and design of information	E2 Access to the e-learning resources on and off campus
	E3 The layout and design of information	E5: Language Support	
Support and training	ST2 Friendliness of support team	ST1: Availability of offline technical support	ST3 Availability of online help desk
	ST3: Availability of online help desk	ST3: Availability of online help desk	ST1 Availability of offline technical support
	ST4: Availability of training		ST4: Availability of training

Table 7.43 Mutual CFA factors and their loaded items

As the table shows, the five mutual factors have been maintained after the CFA. However, there were a few changes in the items loaded to these factors. For example, 'S2: The student's learning style affecting the use of eLearning' and 'S1 Students' willingness to participate in e-learning' have been removed from being loaded to the academic staff' students' characteristics factor. The same goes for 'S2 My learning style is affecting my use of eLearning' which has been removed from the students' "students' characteristics factor". Moreover, the item ‘I4 My ability to use the eLearning system effectively’ has been removed from being loaded onto academic staff’s instructors’ characteristics factor. Changes also happened in the students’ instructor characteristics factor where the items ‘I4:Instructor ability to use the eLearning system effectively’ and ‘I5 Instructor’s style of teaching using eLearning technologies’/ students’ have been removed. Two more factors were also removed from being loaded to students’ technology infrastructure factor and they are ‘T7 Availability of computer labs’ and ‘T8 Reliable technical infrastructure’.

Most of the items loaded on the system access have been maintained from the EFA results apart from Experts’ system access where the items ‘E1 Ease of registration on e-learning’ and ‘E2 Access to the e-learning resources on and off campus’ were removed. Lastly, changes also appeared in the training and support factors where in the experts’ CFA results the items ‘ST2 Friendliness of support team’ and ‘T4: Internet speed’ were removed. The students’ training and support has also lost ‘ST2 Friendliness of support team’ as a result of performing CFA tests.

7.7 Summary and Conclusion

This thesis has gone through two main phases. The first was introduced in chapter Four where interviews with experts in the field of e-Learning were interviewed and the data was analysed and results were presented. This chapter contained the data analysis of the second and main phase of this research project where data collected from academic staff, experts’ sample, and a sample of student in King Saud University were analysed and results were presented. This chapter helps having a better understanding of the viewpoints of the different groups of users and managers about what can affect the success of an eLearning system, especially in an environment to Saudi Arabia. In specific, the chapter presented the results of performing EFA and CFA. The organisation of the chapter was focused on processing each sample’s data analysis and presenting the EFA analysis then the CFA analysis results before proceeding to the next sample data. This intended to help the reader to get the full image about the viewpoint of that sample. Once all the samples’ data were processed, a brief comparison between the results of the analysis was presented. As described in the last section, differences in the perspectives of the questioned respondents appeared in both of what impact the success of an e-Learning system and to what degree it impacts t. thus, the results of analysing the data have shown that the surveyed samples had different opinions about the number of factors which impact the success of an eLearning system and the priority or importance of a certain factor in terms of that impact. However, while differences have occurred, it was noticeably clear that all the samples share a common set of factors which they all believe that they impact the success of an e-Learning system. As a matter of fact, more than half of the factors resulted in all the data results for all the groups are actually mutual between these groups. Though, there are still differences in terms of the numbers of items which are loaded to each factor and the order of importance of each of these items. This could be an important part of the comparison and discussion which will be presented in the next chapter and focus on checking the similarities and differences between the outcomes of this chapter and therefore this project in comparison with similar research works which were presented in the second chapter.

CHAPTER EIGHT: DISCUSSION

8.1 Introduction

The body of the literature presented in Chapter Two has shown that there is a lack of studying the perspectives of many e-learning stakeholders regarding e-learning CSFs. In particular, there is a clear lack of such studies in developing countries in general and in Saudi Arabia in particular. This project aimed to fill this gap through carrying a comprehensive investigation of academic staff, experts, and students' perspectives on the topic in concern. Moreover, the previous chapter has reported the results of analysing the data collected from the three e-learning stakeholders' samples. This chapter looks at these results in light of the relevant literature to see where they match other researchers' work and where they differ. Accordingly, a similar structure to that followed in Chapter Seven will also be followed in this chapter; thus, three figures that represent the initial set of proposed e-learning success factors and their associated items, the factors and the items loaded to them after conducting EFA, and the same items after conducting CFA. This will help visually summarizing the results of the data analysis stages. This is believed to help the reader to have a better understanding of the changes that occurred during the analysis stage before focusing on comparing these results with the related literature. Following these figures for each sample, each factor will be discussed separately and compared to the relevant literature to check the matches and mismatches between this project results and the literature, where it is possible.

This chapter is divided into six sections. The second section focuses on academic staff perspective results and shows how they compare with the relevant literature that focused on the same perspective. In similar style, Sections Three and Four of this chapter focus on experts' and students' perspectives and compare their data analysis results to those of relevant studies. The chapter concludes in Section Five.

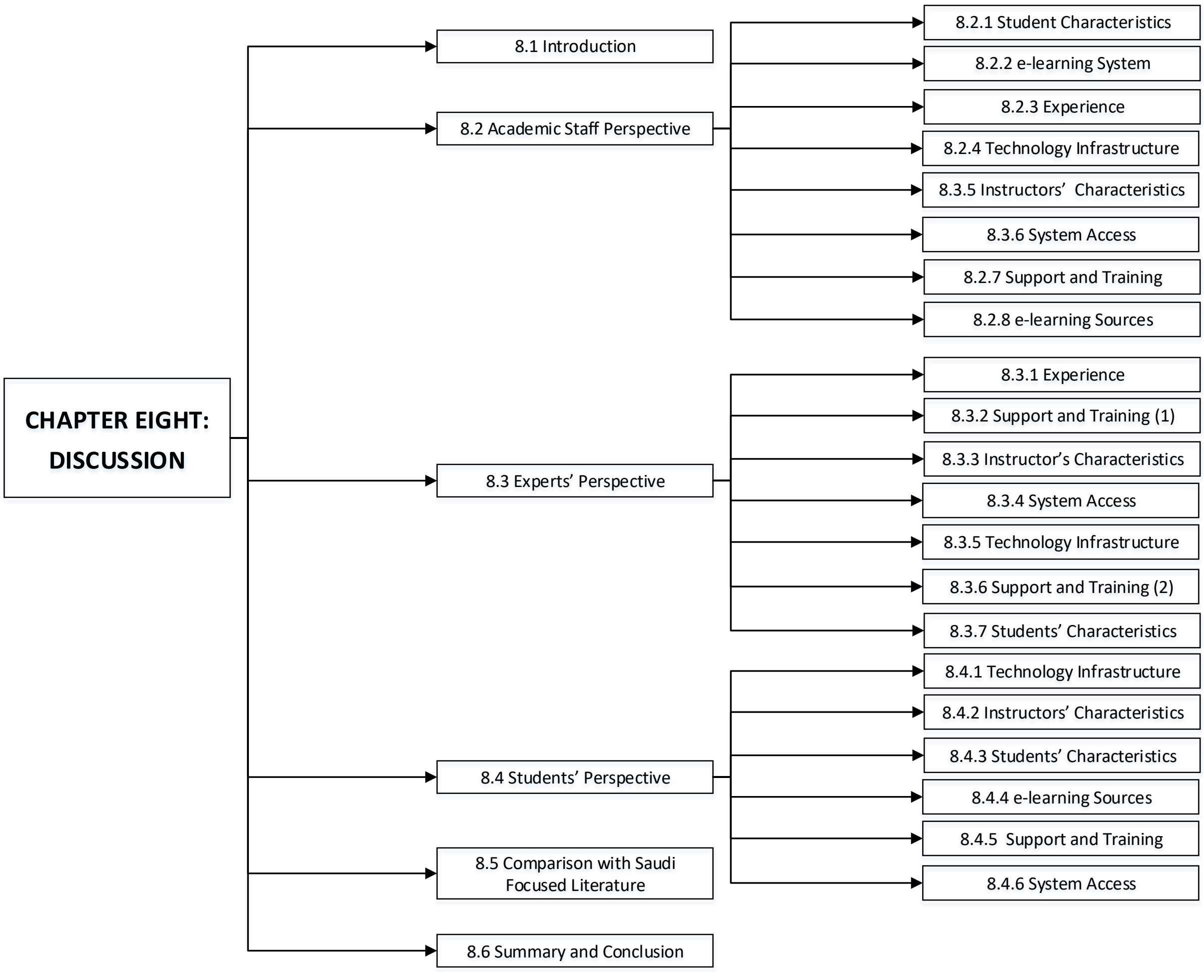

Figure 8.1: Chapter Sections

It was described in great details in Chapters Six and Seven, the data collected from samples (academic staff, experts, and students) using highly similar questionnaires. These questionnaires were based on an intensive literature review and were supported by the findings from the preliminary investigation presented in Chapter Four. In addition to the demographic data section, the questionnaires contained five factors which were believed in the literature to be of high importance and impact on the success of an e-learning system. A few minor differences were present especially in the students' questionnaires where it was believed that specific questions or items to evaluate are beyond their range of using an e-learning system (i.e. learning material preparation). Chapter Seven presented the two techniques that were used to analyse the collected data (i.e. EFA and CFA) and it also presented the results of that analysis. However, having reached an understanding of what the three main e-learning groups users consider as important and relevant to the success of an e-learning system especially in a Saudi environment, the next step would be to check where do these results fit within the wider global environment of e-learning CSFs. This is the purpose of this chapter. Sections 8.3, 8.4, and 8.5 give a brief summary of academic staff data analysis results using both EFA and CFA and then compare these results with other researchers works who investigated academic staff perspective as presented in the Second and Fourth chapters.

8.2 Academic Staff's Perspective

Analysing academic staff data using EFA and CFA has shown some changes to the initial set of factors and associated items. While the initial set contained five factors with 32 associated items, in the EFA results, these factors became nine with only 31 associated items as some were removed because they did not pass the EFA tests. Figure 8.1 shows the initial set of factors and associated items as they were presented to the respondents in the questionnaire.

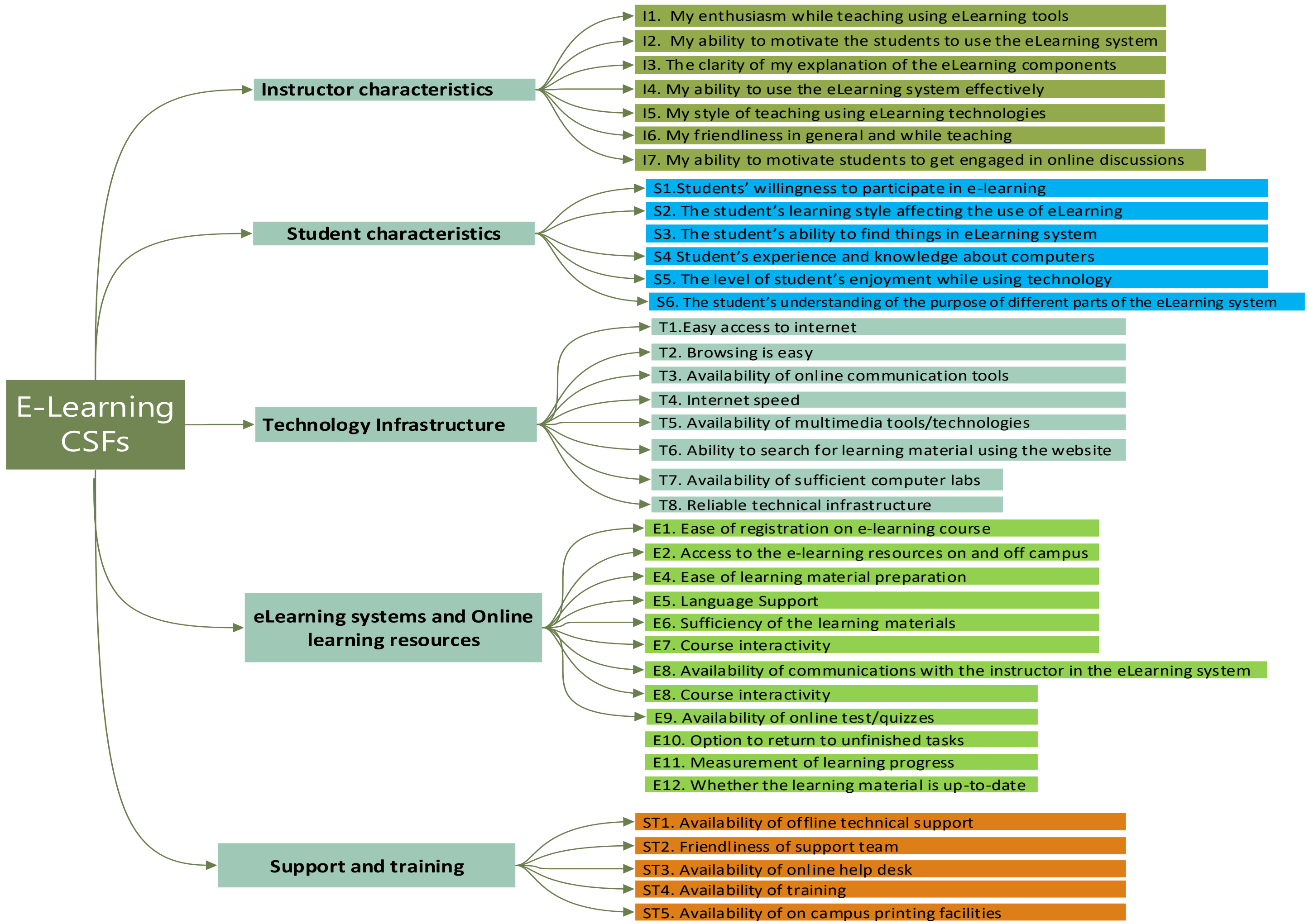

Figure 8.2: Initial set of e-learning CSFs and associated items

Figure 8.2 below shows the results of EFA of academic staff data.

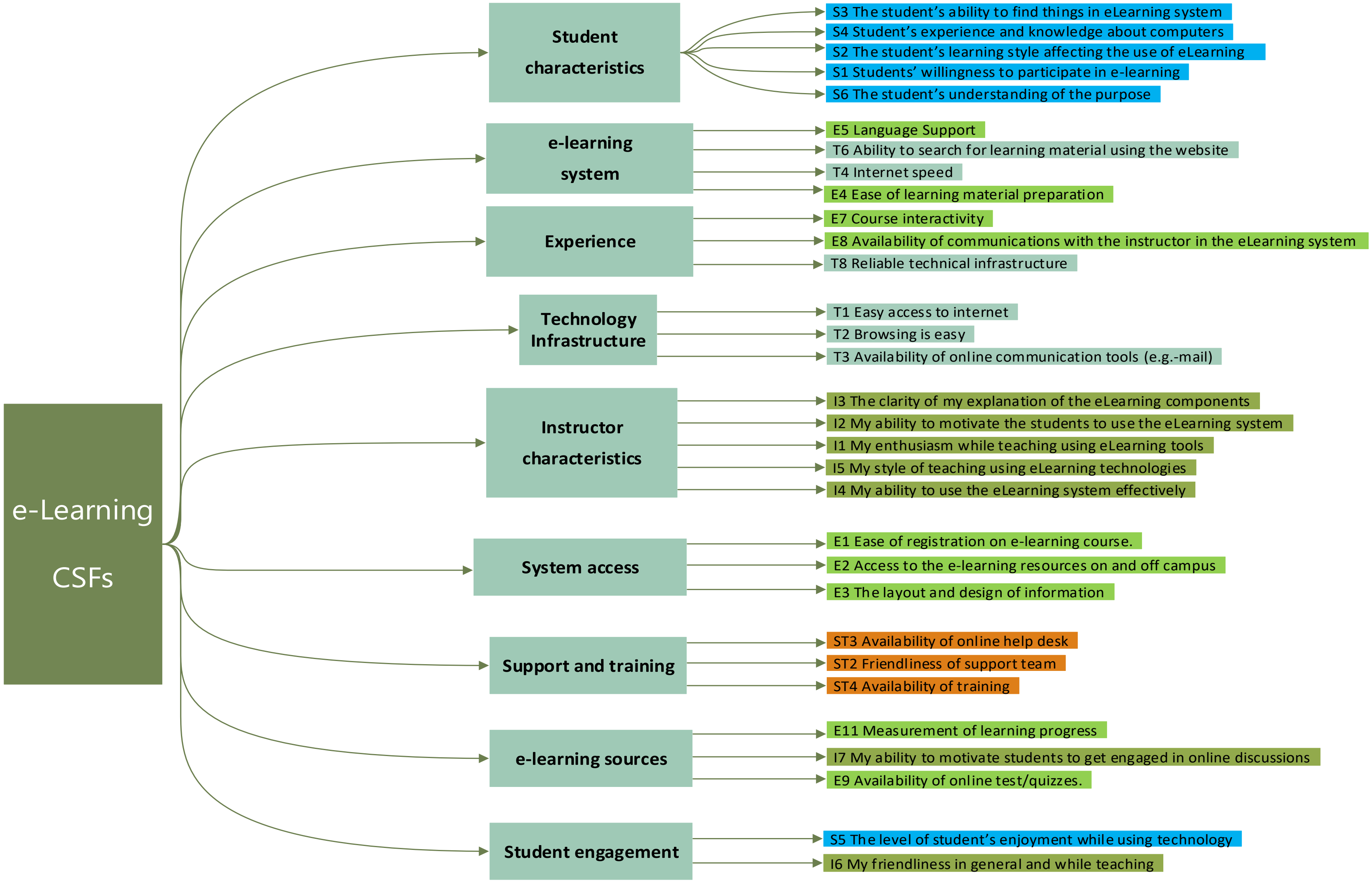

Figure 8.3. Academic Staff EFA results

As figure 8.3 shows, while the initial number of factors has grown from five to nice, the total number of items associated with them has been reduced from 37 to 31. Moreover, the order the factors and the associated items in figure 8.2 reflects the importance of each factor (from high to low) and the importance of each item among the associated items with each factor (from high to low as well). The results of CFA have reduced the number of factors and the associated items. As the following figure shows, the factors have been reduced to eight and the associated items have been reduced to 23.The following figure (8.4) depicts these results.

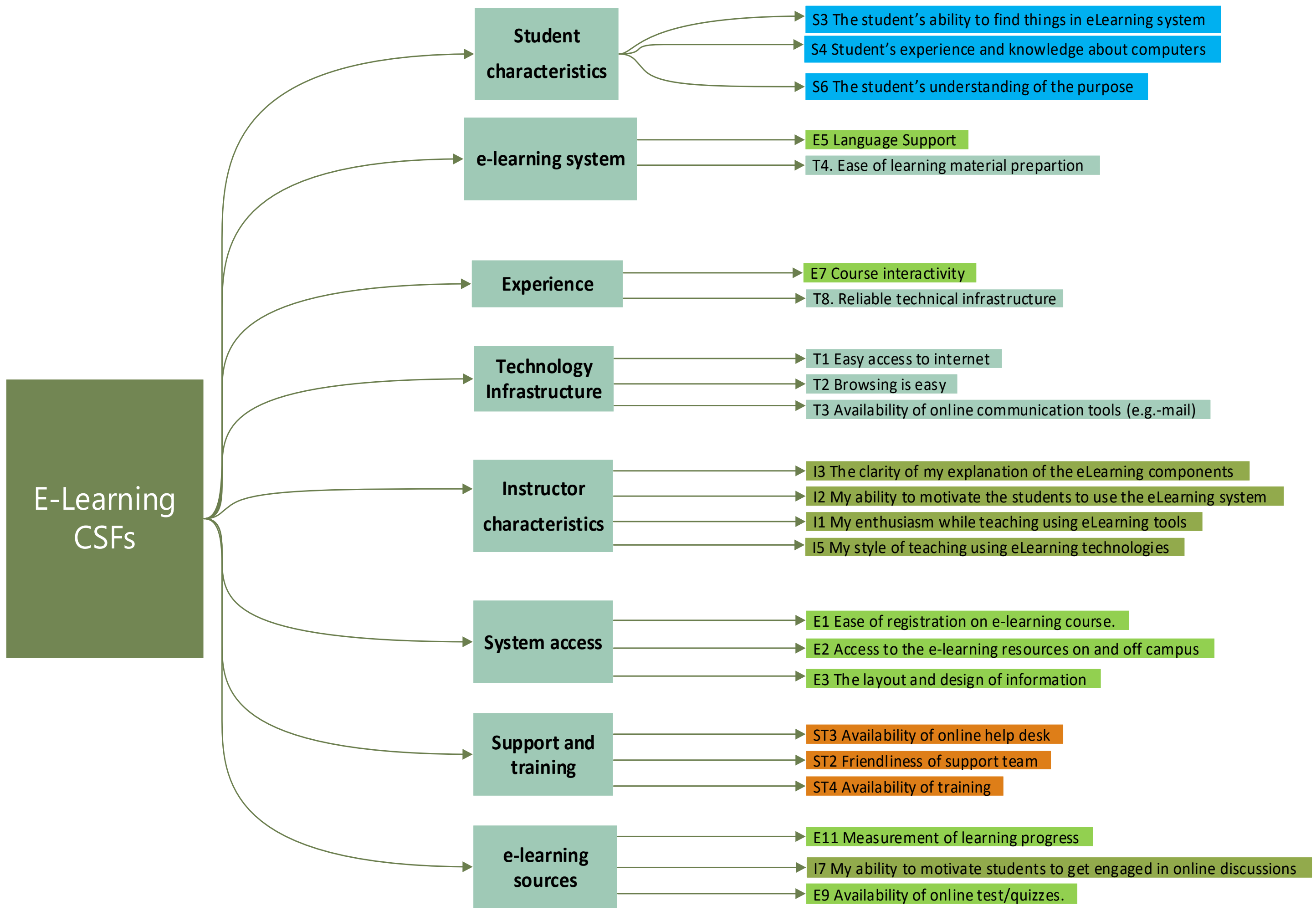

Figure 8.4. Academic Staff CFA results

8.2.1 Students' Characteristics

As figure 8.4 shows, the academic staff have considered students characteristics as the most important factor among the initial five suggested factors. From the initial six items associated with this factor, only three were left after CFA with 'S3: the student's ability to find things in e-learning system' as the most important item loaded to this factor and 'S6: the student's understanding of the purpose' as the least important item. Nearly every article that has discussed e-learning CSFs has included a students' characteristics (e.g. Selim, 2007; Menchaca and Bekele, 2008; Bhuasiri et al., 2012; Mosakhani, 2010; Musa and Othman, 2012; Puri, 2012; Taha, 2014; Abdel-Gawad, 2015). More specifically, the following articles have discussed the academic staff perspective on students' characteristics: Menchaca and Bekele (2008), Bhuasiri et al. (2012), Ahmed (2013), Taha (2014), and Abdel-Gawad (2015); these studies were presented in Chapters Two and Five but none of them has given the highest importance (if the study conducted factors importance investigation) to student's characteristics. For example, Menchaca and Bekele (2008) have given the highest importance to technology related factor (Similar to technology infrastructure which will be discussed later in this chapter in Section 8.2.4). Bhuasiri et al. (2012) also gave the heist important rank to infrastructure and system quality factors. The rest of the studies have not provided importance order for the factors they investigated. As mentioned earlier, three items remained to be loaded on the students' characteristics factors. The most important items among these according to the academic staff perspective is the student's ability to find things in e-learning system. This factor was presented in the literature by authors such as Selim (2007), Musa and Othman (2012), Puri (2012), Taha (2014), and Abdel-Gawad (2015). None of the studies that considered academic staff perspective have given a high importance to this item; instead, academic staff have prioritised other items as more important . For example, the content quality, the layout and design, and the quality of the infrastructure. These items combined together are believed affect the student's ability to search for resources on the e-learning system.

The second item that is loaded onto the students' characteristics in term of its importance is the student's experience and knowledge about computers. This item in particular has been emphasised by many researchers. For example, it was discussed in the context of e-learning CSFs by Selim (2007), Menchaca and Bekele (2008), Bhuasiri et al. (2012), Musa and Othman

(2012), Puri (2012), Malik (2010). From academic staff perspective it has been studied by Menchaca and Bekele (2008) and Bhuasiri et al. (2012). Both authors have considered technical proficiency by both students is of high importance by the respondents. In particular, Bhuasiri et al. (2012) research showed that teachers have considered student's computer self-efficacy as the most important item associated with students' characteristics. Lastly, the least important item associated with this factor is the student's understanding of the purpose of the e-learning system. Selim, 2007, Mosakhani, (2010), Musa and Othman (2012), Puri (2012), Abdel-Gawad (2015) and Malik (2010) have all considered this item and asked the different users groups about it. From academic staff perspective, Abdel-Gawad and Woollard (2015) are the only researchers who have considered it. However, the results the authors have reported were mainly based on the analysing the focus groups data (learners' perspective) and the academic staff perspective was omitted.

8.2.2 e-learning System

The second category based on importance according to academic staff results is the e-learning system. As it can be seen when comparing the initial set of factors in figure 8.1 to those in figure 8.2 and 8.3, this is a new factor which emerged due to conducting EFA and CFA. The two items that are loaded onto this factor were taken from e-learning resources factor and technology infrastructure factor. While this factor is not a standard one from those most popular in the literature review, however, its nature is close to e-learning resources which will be discussed in detail in terms of items loaded to it and the nature of these items in section 8.2.8 . In the final CFA results which are depicted in figure 8.3, two items are loaded to this factor and they are the language support and ease of learning material preparation with language support being the most important and the ease of learning material preparation being the least important. The language support item was originally associated with the e-learning sources factors and is proposed by several authors such Bhuasiriet al. (2012), Puri (2012), Ahmed (2015) and (FitzPatrick, 2012) and it is important in situations where students and instructors are multilingual; in such contexts offering additional languages support could make the eLearning system more usable. As for the importance ranking for language support from academic perspective, while Bhuasiri et al. (2012) gave a low importance, FitzPatrick (2012) has ranked the simplicity of the language used in designing the e-learning system as the 24th most important item among the 30 he evaluated. On the other hand, ease of learning material preparation which was only asked about by the academic staff and experts, was never been considered by other researchers; thus, this item is a genuine addition by the researcher of this project.

8.2.3 Experience

The third most important factor according to the academic staff is experience which is another factor that appeared as a result of conducting EFA and CFA. The nature of the items loaded to this factor focus on different parts of the e-learning system which impact how the users experience it. Two items are loaded to this factor are course interactivity and the reliable technical infrastructure. Authors such as Selim (2007), Menchaca and Bekele (2008), Musa and Othman (2012), FitzPatrick (2012) and Ahmed (2013) have discussed system interactivity from different perspectives. However, from academic staff perspective, this item has been discussed in FitzPatrick (2012) only. According to FitzPatrick (2012), the interface of the e-learning system (which includes its interactivity features) has been placed in the second place in the third most important category which is the system design category. Nevertheless, other items associated with other factors can relate to the system interactivity and will be discussed in the following subsections. For example, in Section 8.2.8, availability to online test/quizzes is considered as important by the academic staff. The second items that is loaded to this factor is the availability of reliable technical infrastructure. This is one of the most discussed items of category of items in the literature as it is strongly emphasised and understood that without a suitable technical infrastructure, the basic concept of an e-learning system would not succeed. The availability of suitable technology tools was ranked as the most important category of factors by Menchaca and Bekele (2008). A similar ranking was suggested in Musa and Othman (2012)'s work where the technology related items were ranked most important against students' characteristics items.

8.2.4 Technology Infrastructure

The fourth factor in order of importance according to the academic staff point of view is Technology Infrastructure which was one of the original proposed five factors. This factor however, has lost five of its originally associated items, which have either has been moved to other, or to new factors or do not appear in the final results. Noticeably, unlike e-learning system and experience resources, this factor did not gain any new items from other factors as a result of EFA. As a factor, it has been discussed and mentioned, either under the same title (technology infrastructure) or other similar titles, in nearly every relevant study. Examples of such works include those of Selim (2007), Masrom (2008), Menchaca (2008), Bhuasiri et al. (2012), Mosakhani (2010), Musa (2012), FitzPatrick (2012), Puri (2012), Ahmed (2013) and Taha (2014). From the academic staff point of view, it has been investigated by authors such as Menchaca and Bekele (2008), Bhuasiri et al. (2012) and FitzPatrick (2012). A very noticeable observation about all these three research works is that they have placed technology infra-structure in the most important position in terms of its impact on the e-learning system success. Menchaca and Bekele (2008), for example, emphasise the importance of creating technological tools that help users to overcome complicated tasks.

This factor has three items loaded to it as shown in figure 8.3 and they are easy access to internet, browsing is easy and availability of online communication tools (e.g.-mail). Checking these factors in the mentioned studied shows that easy access to the internet has been classified as highly important by Menchaca and Bekele (2008) while has been ranked at a lower importance by Bhuasiri et al. (2012). Easy browsing of the e-learning system can be used to refer to different items in the e-learning system design ; for example, Bhuasiri et al. (2012) emphasise that having clear direction of the system is one of the most important five items that impact the success of the e-learning system. On the other hand, Taha (2014) has focused on the importance of system design in general and its role in making the system effectively usable. The availability of online communication tools has also been discussed widely in the literature (e.g. Selim (2007), Masrom (2008), Menchaca and Bekele (2008), Bhuasiri et al. (2012), FitzPatrick (2012), and Ahmed (2013). Bhuasiri et al. (2012), for example, claims that the academic staff have ranked synchronous tools as third most important and asynchronous as the least most important.

8.3.5 Instructor' Characteristics

Another one of the originally listed factors is the instructor' characteristics which focuses on how the instructor's knowledge, abilities, and attributes can affect the success of e-learning system. Similar to the students' characteristics factor, instructor's characteristics is one of the most researched factors in the relevant literature. Selim (2007), Menchaca and Bekele (2008), Bhuasiri et al. (2012), Mosakhani, (2010), Musa and Othman (2012), Puri (2012), Ahmed

(2013), Taha (2014) and Abdel-Gawad (2015) have all considered instructor's characteristics in their studies. Bhuasiri et al. (2012), Ahmed (2013), Taha (2014) and Abdel-Gawad and Woollard (2015) have considered it from academic staff perspective. Bhuasiri et al. (2012) work results have placed instructor' characteristics in the third most important place. Ahmed (2013) have given a higher level of importance for instructor's characteristics and those factors that affect the instructors' intention to use the e-learning system. Taha (2014) results matches those of Bhuasiri et al. (2012) and they place instructor's characteristics in the third place. Lastly, Abdel-Gawad and Woollard (2015) results have placed instructor's characteristics in the second most important place. As it can be noticed that neither the results of this study or the results of other studies have put instructor's characteristics in the most important place.

In term of the items loaded to this factor, from seven originally proposed items, only four have passed the EFA and CFA test. Starting from the most to the least important, these items are the clarity of the instructor's explanation of the eLearning components, his or her ability to motivate the students to use the eLearning system, his or her enthusiasm while teaching using eLearning tools and his or her style of teaching using eLearning technologies.

Instructor's explanation of the eLearning components was investigated by Selim (2007) and Puri (2012) from students' perspective. However, it was noticed that no previous studies have attempted to investigate this item from academic staff perspectives. This is one of the small contributions of this research project where it explores points or areas which have not been investigated before. The instructor's ability to motivate the students to use the eLearning system was studied by Selim (2007), Menchaca and Bekele (2008), Mosakhani, (2010) and Ahmed (2013), however, Menchaca and Bekele (2008) and Ahmed (2013) are the ones who studied from academic staff perspective. Nevertheless, Menchaca and Bekele (2008) results shows that despite being proposed in their original research agenda (questionnaires and interviews), all human related factor have fell of the more important factors along the items associated with them. More focus was given by Menchaca and Bekele (2008) research respondents to the availability of technology tools as mentioned earlier. Ahmed (2013), on the other hand, did not report the exact importance of this item as they have focused on what motivate the teacher to use the e-learning system as well. Finally, the instructor's style of teaching using eLearning technologies was studied by Selim (2007) and Taha (2014) with Taha

(2014) being the only study that considered this item from academic staff's perspective. Taha (2014) reports that their teacher respondents have given a high importance for teaching style in e-learning environment as it is imperative for the teachers to adopt teaching styles that are suitable for the new equipment (i.e. e-learning technologies).

8.2.6 System Access

Another factor which emerged as a result of EFA and CFA is system access which focuses on the e-learning system parts and components and how they make it more usable. Being a new factor makes it harder to compare it (as a factor) to the results of other studies as it has not been studied before. However, the items which are loaded to it can be compared to the results of other studies. The three items that became loaded to this factor were originally associated with the e-learning resources factor which again focuses in the e-learning systems and its features. These three items are ease of registration on e-learning course, access to the e-learning sources on and off campus, and the layout and design of information. The ease of registration on e-learning course was originally proposed by Selim (2007), Masrom (2008), Menchacaa and Bekele (2008), Bhuasiri et al. (2012), FitzPatrick (2012), and Ahmed (2013) and investigated from academic staff perspective by Menchacaa and Bekele (2008), Bhuasiri et al. (2012), FitzPatrick (2012) and Ahmed (2013). In Menchacaa and Bekele (2008), enrolment in an e-learning course was listed under pragmatic issues category as described in Chapter Two. Although the whole category was ranked in the lowest importance place among the three categories suggested, the ease of enrolment in an online course was given a high importance under that category. Bhuasiri et al. (2012) also included ease of use under infrastructure and system quality which focuses on the general friendliness and usability of the e-learning system. This item was placed in the third place among six items under that category of items. FitzPatrick (2012) has included user friendly e-learning system item under the design factor. The design factor itself was placed in the second most important place. However, the friendly e-learning system item was placed in the 21st place among a total of 30 items associated with all the different factors. FitzPatrick (2012) did not specify where the friendly e-learning system item is ranked among the other system design items. Lastly, Ahmed (2013) has considered perceived complexity of using the e-learning system at the lowest level of importance among five other factors which were investigated.

The second most important item loaded to this category is the ability of users access to the e-learning sources on and off campus. This item was originally presented in Selim (2007), Musa and Othman (2012), Ahmed (2013) and Taha (2014) and investigated from academic staff perspective by Ahmed (2013) and Taha (2014). While Ahmed (2013) did not report what level of importance this item has, he reported that system dimension in general is in the second place of importance. On the other hand, Taha (2014) have emphasised on the importance of technology availability as of technology quality dimension of the e-learning system.

8.2.7 Support and Training

Another factor that was maintained from the initial set of proposed factors is the support and training. As its name reflects, this factor main focus is the technical help and training the users receive in order to prepare them to effectively use the e-learning system, to solve any technical issues they face while using the system or to help them carry out tasks by providing the suitable facilities. Originally, this factor has five items associated with it. The result of conducting EFA has reduced these factors to four and then CFA tests have reduced them further to three. Support and training factor is usually mentioned in most of the relevant literature (e.g. Selim (2007), Masrom (2008), Menchacaa and Bekele (2008), Mosakhani (2010), FitzPatrick (2012), Puri (2012), Ahmed (2013), Taha (2014), Abdel-Gawad (2015). Focusing on academic staff perspective, this factor was studied by Menchacaa and Bekele (2008), FitzPatrick (2012), Taha (2014) and Abdel-Gawad (2015). FitzPatrick (2012) has placed the support category of e-learning CSFs in the third most important place while Taha (2014) has discussed the support and training on how to use e-learning system under Control of Technology category of factors and under pedagogy and teaching style category.

While Menchacaa and Bekele (2008) have listed all items related to the support under leadership category, he equalised the importance of the different categories and did not provide specific ranks for the different categories and different items associated with these categories. According to Taha (2014), providing training to the academic staff is vital o the success of the e-learning system as it will directly affect the efficiency of their use of that system. It also affects the teaching style of these staff and helps them to adopt teaching approaches that more suitable to be used in an e-learning environment. As mentioned earlier, three items were maintained from the original five proposed items and these are the availability of online help desk, the friendliness of support team, and the availability of training. Although it is an important part of the support mechanisms in general (e.g. Menchacaa and Bekeleb, 2008), availability of online help desk has never been investigated from academic staff point of view. Taha (2014), for example, has discussed the importance of providing technical support and training courses to the users, especially teachers, to help them use the system more effectively. In this research, this was interpreted as the availability of helpdesks, both online and offline and the availability of training. A similar conclusion can be drawn for the friendliness of support team and the availability of training when considering Taha (2014). All these items were discussed under control of technology.

8.2.8 e-learning Sources

The final factor which also emerged as a result of performing EFA on the academic staff data is the e-learning sources. This factor mainly focuses on certain e-learning system features that help making the system more usable; thus, this factor, in a way, is similar to the e-learning system factor discussed earlier. As figure 8.2 and 8.3 show, the academic staff respondents have placed in the lowest position of importance.

This factor has three items loaded to it and they are measurement of learning progress, the teacher's ability to motivate students to get engaged in online discussions, and the availability to online test/quizzes. The first and last of these items came from e-learning sources factors in the original set of proposed factors while the second one came from the instructor's characteristics factor. measurement of learning progress has been studied by Selim (2007), Mosakhani (2010), FitzPatrick (2012) and Ahmed (2013) with FitzPatrick (2012) studying it from the academic staff perspective. As it was mentioned earlier, FitzPatrick (2012) has given a separate ranking for the factors or categories of CFSs and the actual items. The Evaluation category which contained different types of evaluation including the assessment of students' attainment has been placed in the lowest place of importance with the assessment of students' attainment itself being placed in the 25th place out of 30 total items evaluated.

8.3 Experts' Perspective

Similar to how academic staff were treated, experts' data have been through the two types of analysis; EFA and CFA. The results have also shown changes to the initial sets of factors and associated items as the following three graphs depict.

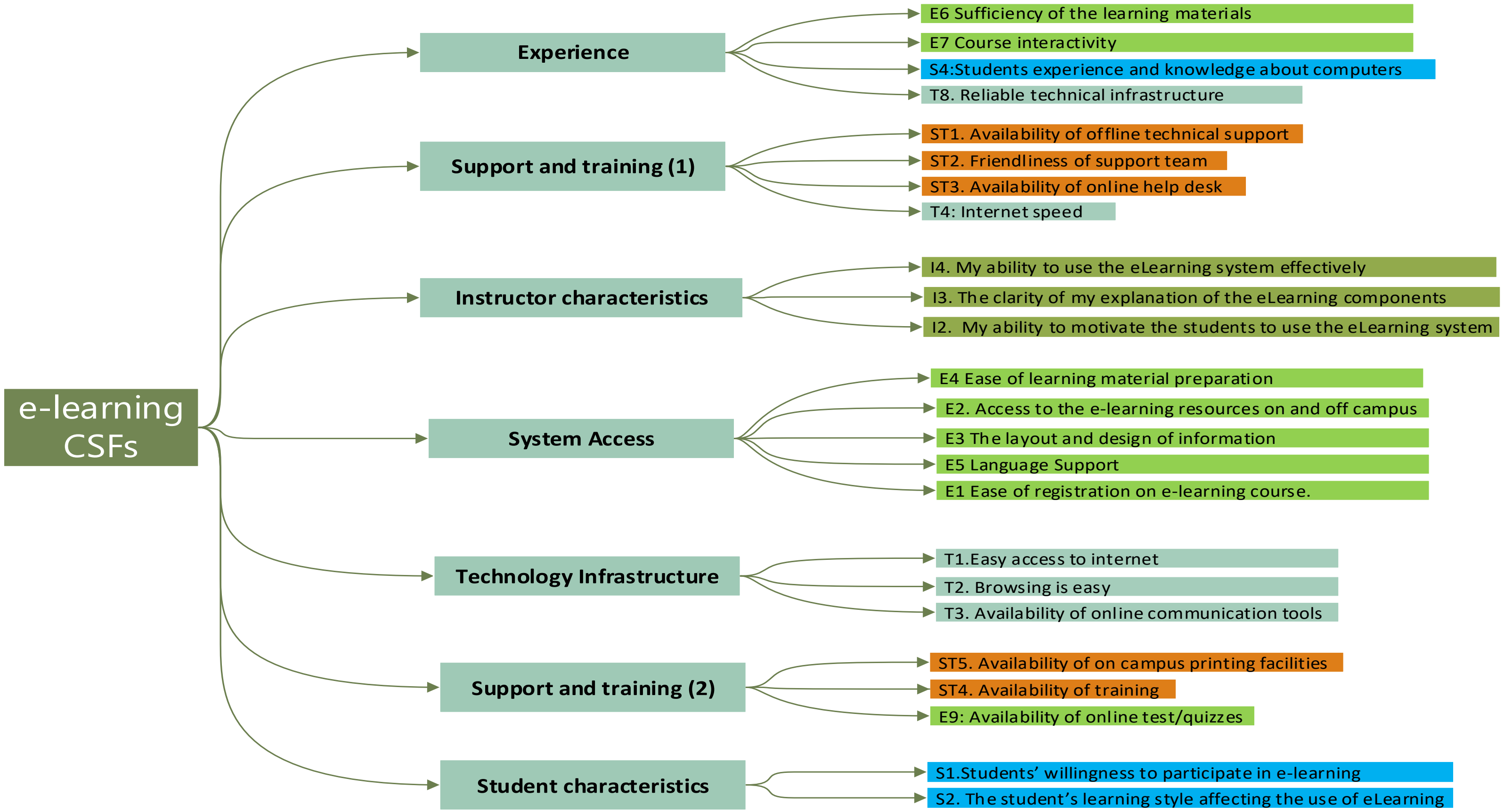

Figure 8.5. Experts EFA results

In similar way to what happened with the academic staff, analysing the data collected from experts using EFA approach has extended the initial set of factors from five to seven. furthermore, the items loaded to these factors were reduced from 37 to 24 only. Moreover, the order the factors and the associated items in figure 8.4 reflects the importance of each factor (from high to low) and the importance of each item among the associated items with each factor (from high to low as well). Moving from EFA to CFA has resulted in reduction of the number of factors and the associated items. As the following figure shows, the factors have been reduced to seven and the associated items have been reduced to 18 only.

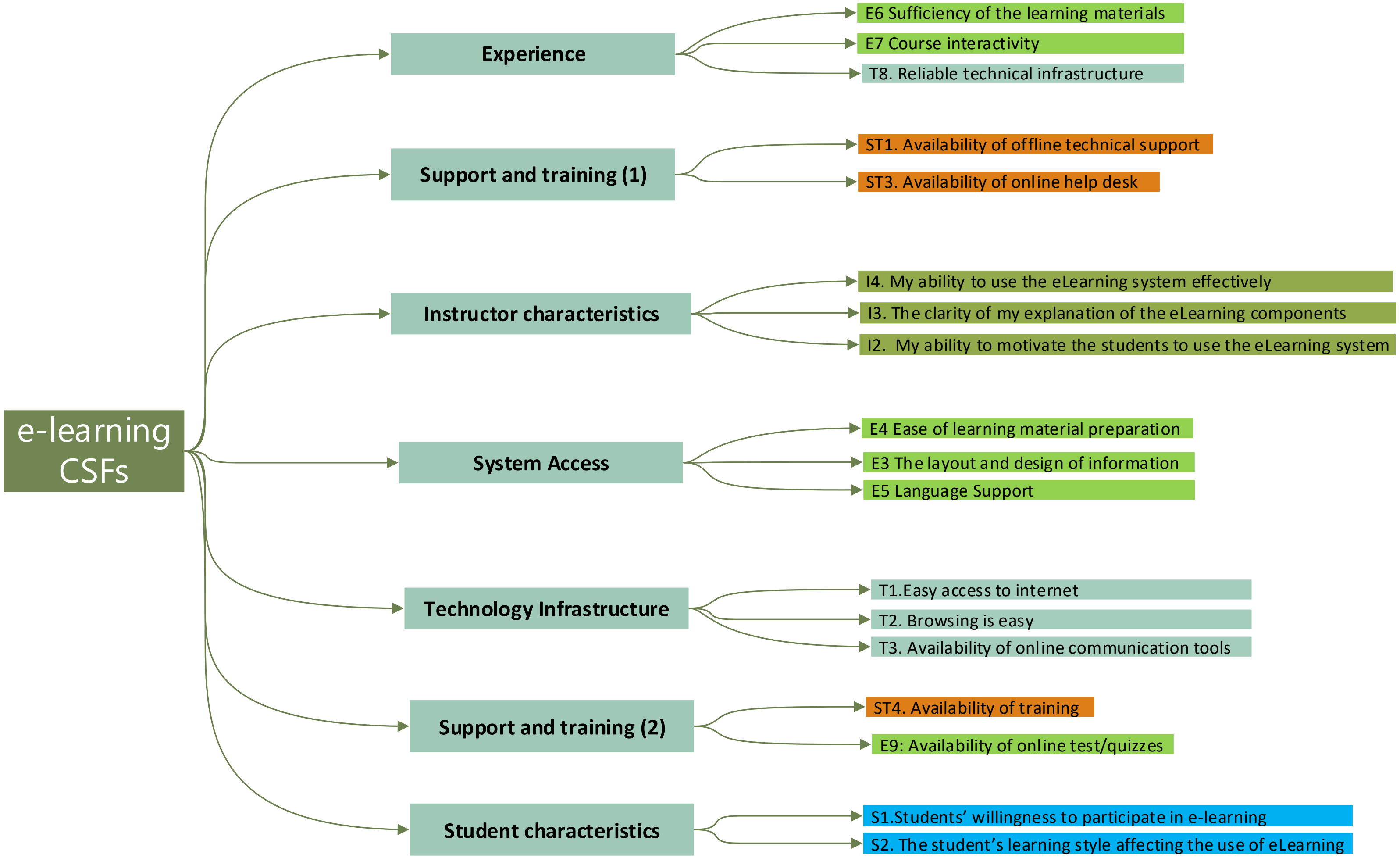

Figure 8.6. Experts' CFA results

8.3.1 Experience

Experience is same factor which was created due to EFA in academic staff results has also appeared in the experts' results. However, experts have placed it as the most important factor among the final seven factors. It can be noticed that both EFA and CFA results for experts' data have the same number of factor with some differences in the items loaded to these factors. The experience factor focuses on different parts of the e-learning system which impact how the users experience it as mentioned earlier in this chapter. As a new factor it is not possible to compare it to the exact same factor in other research literature, however, the items loaded to it will be compared with their matching item.

Performing CFA test on the EFA results has resulted in the removal of one item (Student's experience and knowledge about computers) and left three items loaded to the experience factor. These items are sufficiency of the learning materials, course interactivity and reliable technical infrastructure. sufficiency of the learning materials was originally proposed in e-learning sources factor in the original set of factors and proposed in the literature by Selim (2007), Bhuasiri et al. (2012), Mosakhani (2010), Ahmed (2013) and Taha (2014). However, none of these studies have considered this item from experts' point of view. Moreover, this item in particular was also removed from the results of academic staff data analysis results as it did not pass the EFA tests. The course interactivity item, in contrast to the academic staff results, was placed in second most important place when it was placed in the most important place by the academic staff. The course interactivity item was also proposed in the original set of factors and item and it was associated with e-learning sources factor and proposed in the literature by Selim (2007), Menchaca and Bekele (2008), Musa (2012), FitzPatrick (2012) and Ahmed (2013). However, due to the lack of research that considers the experts' point of view, this item as well has not been deeply investigated from their perspective. FitzPatrick (2012) who investigated experts' point of view as part of three point of views he studied (academic staff, experts, and students), they (experts) have place course design in the fourth out of five in terms of importance. The interface of the e-learning item which can be interpreted as an abstract container of course interactivity has been placed by the experts in the second most place important place among three suggested items.

8.3.2 Support and Training (1)

The original support and training factor had five items associated to it as it was mentioned in the academic staff perspective section. However, conducting EFA on the experts' data has removed one of these items and has divided the remaining four items into two groups, each associated with different factor. These factors are named support and training (1) and support and training (2). Support and training (1) has been placed in the second most important position according to experts' perspective. As the name of this factor reflects, it focuses on what support and help the users receive from the e-learning management. Support and training has been studied nearly in every related article, however, from experts' point of view it has been studied by FitzPatrick (2012) who's study results have placed it in the fourth most important place. Menchaca and Bekele (2008) have also investigated most of the items listed under support and training factor, however, they named it as leadership factors. While emphasising its importance, Menchaca and Bekele (2008) did not report exact rankings for those leadership factors. They emphasised that all the suggested factors are as equal as each other.

In term of actual items, two items were loaded on the support and training (1) factor and they are availability of offline technical support and friendliness of support team. Similar to the case of support and training in the academic staff section, FitzPatrick (2012) did not order the actual items based on their category. However, several items which that can be interpreted as availability of helpdesks have been given high ranks among the 30 investigated items. For example, resource support and technical support which were placed as 2nd and 3rd most important items. The friendliness of support team on the other hand, which was not maintained in the academic staff results, was originally suggested in the literature by Selim (2007), Masrom (2008), Mosakhani (2010) and Puri (2012). However, all these studied have considered students' perspective. Thus, none of the available literature has investigated this item from experts' point of view.

8.3.3 Instructor's characteristics

The third most important factor, according to the experts' point of view is the instructor's characteristics. In comparison with the academic staff results, experts have given a higher importance to this factor. Moreover, while experts' results showed four items associated to this factor, academic staff results have shown only three items, two of them are mutual with those of academic staff's. In comparison with the original instructor's characteristics, performing EFA and CFA tests has removed four of the original items. Instructor's characteristics have been investigated from experts' point of view by Bhuasiri et al. (2012) who placed them as the second most important factor among six different factors they have studied. FitzPatrick (2012) have studied human related factors but there was no specific factor that is designated for instructor's characteristics.

The three items which are loaded to this factor are the instructor's ability to use the e-learning system effectively, the clarity of instructor's explanation of the eLearning components, and his or her ability to motivate the students to use the e-learning system.

Technical proficiency of the e-learning system was emphasised in different sources in the literature. Many authors have discussed how the instructors' ability to use and her or his knowledge of the e-learning system will not only affect their success to successfully use the system but it will also affect their impact on the students and their use of the system. From experts' perspective, Self-efficacy which explained as the user's ability to perform certain tasks using e-learning system successfully has been ranked in the second most important place by Bhuasiri et al. (2012). Moreover, FitzPatrick (2012) rank the role of teachers as facilitators of e-learning, which required high comprehension of the system, in 18th place among the 30 investigated items. Related to this item is the second most important item loaded on instructor's characteristics from experts' point of view which is the clarity of my explanation of the eLearning components by the instructor. The two items are related in the sense that to be able to clearly explain the e-learning system components, the instructor must have clear knowledge about these components and how to use them. Clarity of instructor's explanation of e-learning system component was first introduced in the literature by Selim (2007) and Puri (2012) who both focused on students' perspective. Thus, none of the previous studies has studied the importance of this item from neither academic staff not experts' perspectives.

Lastly, motivating students to use the e-learning system has been widely studied in the literature (e.g. Selim, 2007; Menchaca and Bekele, 2008; Bhuasiri et al., 2012; Mosakhani, 2010; Ahmed, 2013). However, from experts' point of view, Bhuasiri at al. (2012) were the only researchers who attempted to study this item. According to their results, extrinsic Motivation factor was the least important among six factors they have studies.

8.3.4 System Access

System access is another mutual factor between academic staff and experts is the system access which is a new factor that was added due to performing EFA and confirmed through the CFA. As mentioned in the academic staff discussion section, this factor focuses on the usability of the e-learning system and some features that make the users' experience easier. Being a new factor makes it harder to compare it with other researchers' works results. In terms of items loaded to this factor there are three items and they are ease of learning material preparation, the layout and design of information and language Support. Ease of learning material preparation has failed to pass the EFA and CFA tests in academic staff results therefore it was of low importance. However, experts, apparently, give it a high importance considering that it is placed on the top of the three items loaded to the system access factor. Interestingly, this item was originally suggested by Selim (2007) only from students' perspective. In this research project, this item has been removed from questions asked to the students and it was directed to academic staff and experts only as it was believed that students will not be able to answer it correctly as learning material preparation is beyond their scope of using the e-learning system. Therefore, a comparison between experts' results in this research project and students' results In Selim's (2007) work is not possible. Nevertheless, a suitable explanation for receiving a higher importance by experts is that they believed that productivity is a main feature or advantage that e-learning system should offer which can affect the joy and ease the instructors find when using that system.

The second item which is loaded to the system access factor is the layout and design of information which has fallen under a wider category of factors that focuses on the system design in general. the layout and design of information will affect how the users can effectively use the e-learning system to teach (instructors) and to learn (students), and the ease of finding the information on the system; therefore, it is important to have a suitable layout of information. Considering that design factor is one of the most studied e-learning CSFs, layout of information has also been studied by several authors in the literature (e.g. Selim, 2007; Menchaca, 2008; Mosakhani, 2010; Musa, 2012; FitzPatrick, 2012; Pur, 2012;

and Taha, 2014). From experts' perspective, FitzPatrick's (2012) results place the design in the highest place of importance, nevertheless, the second part of the item which is the layout of the information is not directly studied by FitzPatrick (2012). The only relevant item is the updatability of the information offered on the system which is placed in the 20th place among 30 items investigated. Finally, language support which has also been loaded to system access factor in the academic staff results but loaded to e-learning system factor is language support which focuses on offering the system interface in languages that help the users to be able to use the system more effectively, especially in the case of multilingual users' groups. Again, this item can be argued to be part of a bigger category that concerns the design of the e-learning system. FitzPatrick (2012) has focused on language used in designing the e-learning system but it was from its simplicity point of view. Having simple language to design the e-learning system was placed at a lower place of importance as it was placed as the 24th most important item among the 30 items investigated in FitzPatrick (2012).

8.3.5 Technology Infrastructure

Another factor which has been investigated widely in the literature is the technology infrastructure. This factor or category of items usually has a wide spectrum of item that are focused on all technology related issues and items, usually beyond the scope of the e-learning system design. This factor has also been present in the academic staff results and will be in the students' results as it will be discussed later in this chapter. Technology infrastructure has been placed in the second most important position from ICT experts' perspective according to the results of FitzPatrick's (2012). On the other hand, Bhuasiri et al.'s (2012) have placed infrastructure and system quality category, which is very similar to technology infrastructure factor in this research, in the fourth most important category of factor among six total number of categories.

In comparison with the original factor that was proposed by the researcher, this factor had five items associated with it and ended up with only three items loaded to it as a result of performing EFA and CFA on the experts' data. On the other hand, comparing technology infrastructure in Figure 8.3 (academic staff CFA results) to technology infrastructure factor in Figure 8.5 (experts' CFA results) shows identical number of items and identical order of these items which is probably the only case so far. These three items are easy access to internet, browsing is easy and availability of online communication tools. Having reintroduced these items in the academic staff results, the focus will be on checking the literature works that studied, or did not, these items from experts' point of view. Easy accessing the internet has been studied by both Bhuasiri et al. (2012) and FitzPatrick (2012). Bhuasiri et al. (2012) results have shown that ICT experts have place internet quality item as the most important item among six items that experts have evaluated. Similar results are shown in FitzPatrick (2012) results as the availability of fast Internet connection was placed as the seventh most important item among the 30 items they have studied but it is actually the first most important item among technology infrastructure related items. The second item which focus on how easy it is to browse the system could also be related to the speed and quality of the internet connection as it is directly impacted by it and also related to the quality of system design and services. Bhuasiri et al. (2012) is the only study that investigated the ease of use of the system which could also be understood as ease of browsing the system from experts' point of view and their results shows that the experts they asked have placed this item in the third most important place among six items listed. Lastly, the availability of online communication tools was studied by both Bhuasiri et al. (2012) and FitzPatrick (2012). FitzPatrick (2012) results show that the experts in his research have placed effective online communication in third most important place among the 30 items he has studied and second most important place in the technology infrastructure related items. Bhuasiri et al.'s (2012) results shows that synchronous and asynchronous communication were very important for the success of e-learning system. Moreover, online interactions between students and instructor were specifically emphasised as a main tool for motivating the students for using the system.

8.3.6 Support and Training (2)

It was mentioned in section 8.4.2 that that the original support and training factor has been divided into two. The first support and training item was placed as the second most important item by experts as described in section 8.4.2. Support and Training (2) is in the sixth most important place and it has only two items loaded to it. As this is unusual situation where normally all related items are put under one category or factor together, it is not possible to conduct a comparison between this item and the literature.

The two item that are loaded to support and training (2) are the availability of training and availability of online test/quizzes. Training users on how to effectively use the e-learning system in emphasised nearly by every researcher in the field. E-learning and ICT experts agree on the importance of such training according to FitzPatrick (2012) who placed support and training in the third most important place and also placed several items which are related to the support factor in relatively high importance position (e.g. Training of eLearning, Resource support, and Technical support). On the other hand, the second most important item (availability of online test/quizzes) has been less studied than the first, especially from experts' point of view. Generally speaking, this item could be placed under system design or course quality factors. Searching the literature shows that none of the relevant works have investigated this item from experts' point of view.

8.3.7 Students' Characteristics

The least important factor according to the expert respondent of this research is the students' characteristics factor. As it was presented in figure 8.1, this factor started by six items associated to it. However, performing EFA has reduced these items to two which were also have been confirmed through CFA. Comparing these results to the academic staff results shows difference in the importance rank and in the number of item. Academic staff have placed students' characteristics as the most important place in comparison to the seventh and least important place as it was placed by experts. Moreover, performing EFA has reduced the items loaded to this factor from six to five which were then reduced further to three by performing CFA. Interestingly, none of the remaining items are mutual between the two groups. While the remaining three items in academic staff results are the student's ability to find things in e-learning system' as the most important item loaded to this factor, student's experience and knowledge about computers and the student's understanding of the purpose' as the least important item, the remaining items in experts' results are students' willingness to participate in e-learning and the student's learning style affecting the use of eLearning.

In terms of its importance in other researchers' works, from experts' perspective, Bhuasiri et al. (2012) have place learners' characteristics as most important factor while FitzPatrick (2012) has placed all human related factors in the 4th most important place which shows a high difference in opinions among experts in both studies.

As mentioned earlier, the first and most important item loaded to this factor is the students' willingness to participate in e-learning. This item was introduced to the literature by authors such as Selim (2007), Menchaca and Bekele (2008), Bhuasiri et al. (2012), Musa and Othman (2012), Puri (2012), Ahmed (2013) and Malik (2010). Bhuasiri et al. (2012) discusses this item under student's attitude to e-learning and place it in the least most important position among three items which make up learner's characteristics. The rest of the studies have focused on other perspectives. The second item loaded to this factor is the student's learning style affecting the use of eLearning. This item was presented in the literature by authors such as Musa and Othman (2012), Ahmed (2013) and Abdel-Gawad (2015). Nevertheless, none of these studies has investigated experts' point of view.

8.4 Students' perspective

The last point of view that this research has considered is that of the students as a main group of e-learning systems users. Usually, students are the main targeted audience of an e-learning system who their opinion matters the most as without their usage of the system, it can be considered as a failure. This might explain why most of the research that found in the literature focused on students' perspective, fully or partially. In this research, the initial set of factors and associated item presented to the students to categorise and evaluate their importance was highly similar to those presented to the academic staff and experts with very few differences in the associated items. The figure below shows these original set of factors and their associated items. The e-learning sources factor has one item less that it had in the academic staff and experts' factors. The titles of the items have also been shifted to reflect this. For example, E4 in the academic staff was concerning the ease of preparing the learning materials, however, for the students, it was about the language support which was named E5 in the academic staff and experts factors set. This has affected the titles of the factors from E4 on ward.

Figure 8.7: Initial set of e-learning CSFs and associated items presented to students

The following shows the results of applying EFA on the data collected from the students. As the figure shows, while the number of factors has increased to seven instead of original five, number of associated (loaded) items to these factors has decreased to 29 instead of original `. Just like the results of academic staff EFA, the results of students' data analysis show all the five original factors were maintained. The new two factors have taken some of the factors that were associated with the original five factors. Obviously, the order of the factor and the associated items is different from the original presentation and from the results of academic staff and experts' data analysis results.

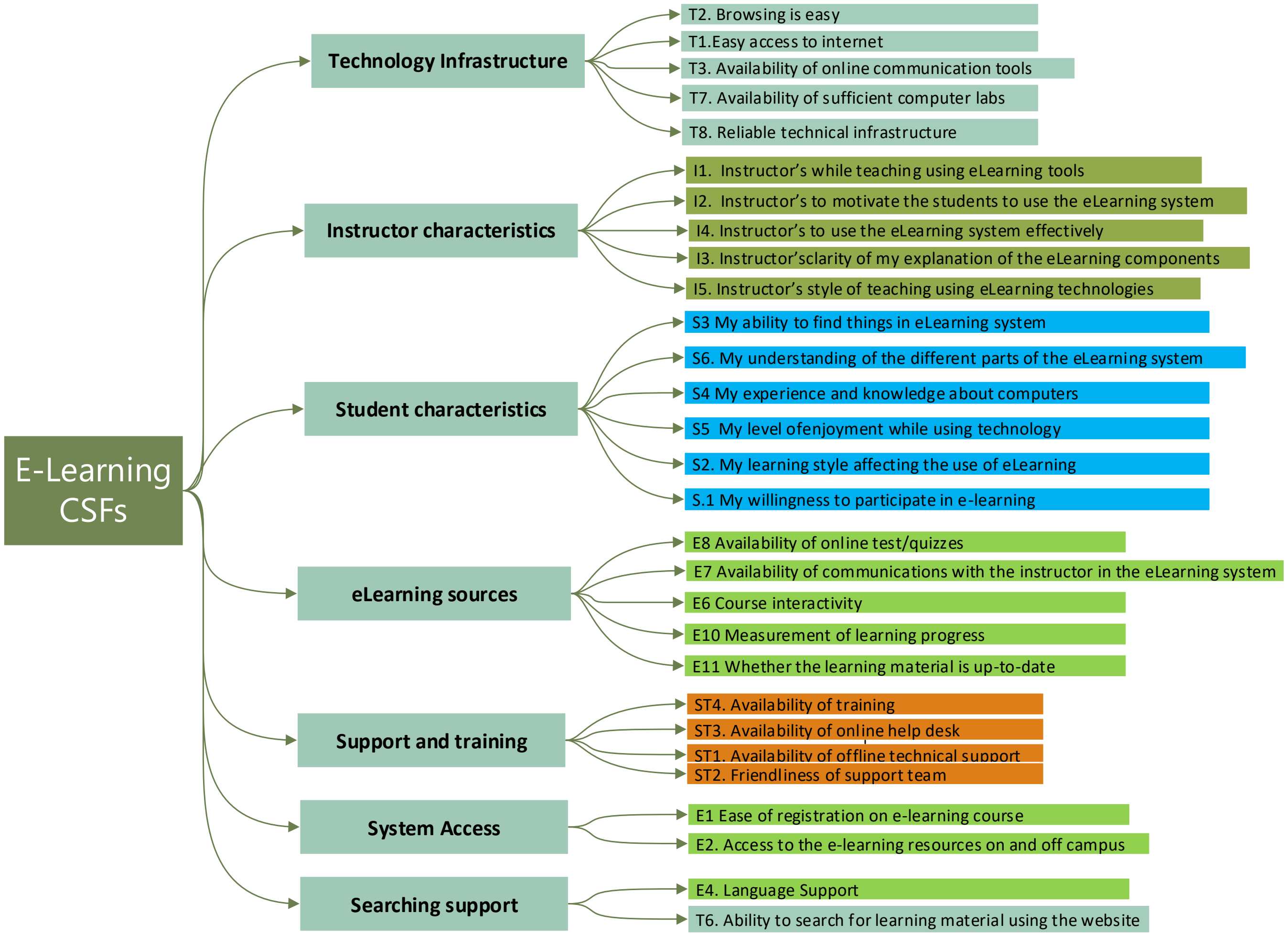

Figure 8.8. Students' EFA results

Figure 8.8 below shows the final results of performing CFA on EFA results for students' data. The number of factors has been reduced by one and the number of associated items has been reduced to 20 from the 27 that emerged as a result of EFA. The searching support factor has been totally removed as it failed to fulfil the CFA tests.

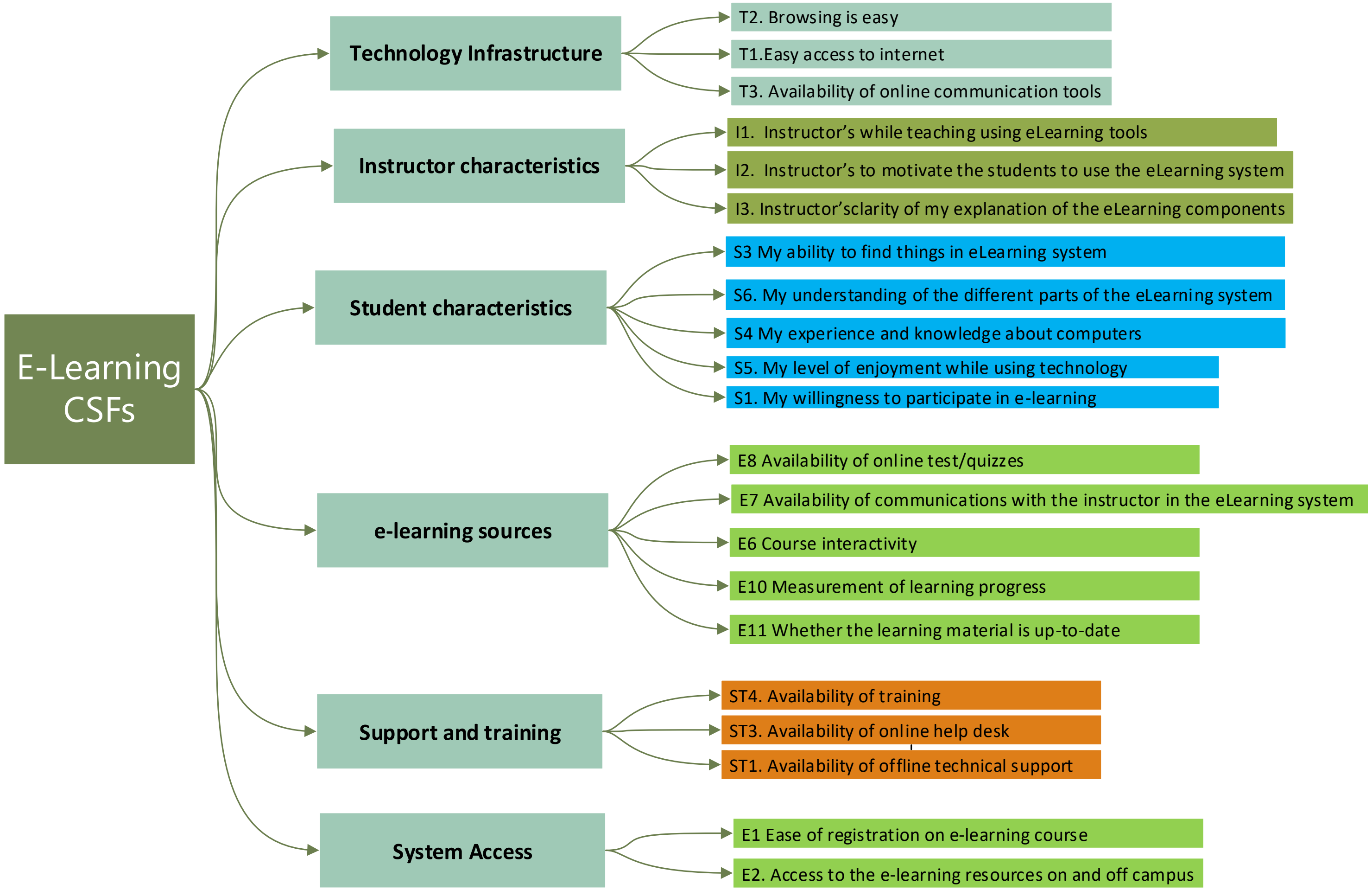

Figure 8.9. Students' CFA results

In similar style to the way academic staff's and experts' results were discussed in the previous sections of this chapter, the following subsections will focus on every factor in figure 8.9 and compare it alongside the items loaded to it with other research works in the literature.

8.4.1 Technology Infrastructure

It was mentioned in different places in this and in the previous chapters that there are five mutual factors in all the results of the different samples. Technology infrastructure is one of these five factors. Comparing the technology infrastructure factor to that in the original set of factors shows that it has been moved from third position in the list as shown in Figures 8.7 and 8.8 to the first and most important factor position. While this could be not that important as the original list was not ordered based on any value, technology infrastructure was placed as fourth most important factor according to the academic staff and fifth most important factor according to the experts; thus, the students have given this factor much higher importance by placing it in the top position of importance.

Technology infrastructure or similar factors have been studied from students' perspectives by several researchers (e.g. Selim, 2007; Masrom et al., 2008; Menchaca and Bekele (2008); Mosakhani and Jamporazmey, 2010; Musa and Othman, 2012; FitzPatrick, 2012; Puri, 2012; Taha, 2014). These studied have shown that students have given different level of importance to technology infrastructure and to its associated items. For example, Selim (2007) results have placed technology related factors in the third most important place among four categories they asked their students respondents to rank. Masrom et al. (2008) have focused on the technological and support factors and ranked the technology related factors in the higher position of importance. Menchaca and Bekele (2008) report that both students and academic staff have placed technology tools as the most important category among four categories they have asked their students respondent to rank. Mosakhani and Jamporazmey's (2010) results have placed technology related items in the fourth most important place. Musa and Othman (2012) have focused on students' characteristics and technology richness and the technology richness and reliability category was ranked as most important category. FitzPatrick (2012) has studied students' perspective alongside other perspectives and concluded that the students' respondents have placed the technology related factor as the most important among the five factors they have evaluated. Puri (2012) has also investigated technology related items from students' perspective and reported that the students ranked technological factor as the third most important among six factors they have considered. Finally, Taha's (2014) results show that the respondents (both teachers and students) placed the role of technology in the third most important place among five categories they have studied. As it was mentioned in Chapter Two, Taha (2014) does not make a clear distinction between the students and teachers results.

Comparing the items associated with the final technology infrastructure factor to those with those associated with the initial technology infrastructure factor and with the academic staff and experts' results shows the following. First, the number of items has dropped from five originally listed to three in the CFA results depicted in Figure 8.8. Thus, the majority of the initial items were not considered as important by students which is the same case with academic staff and experts. Second, this is the only factor which has maintained the same loaded items in all the analysis results (i.e. academic staff, experts, and students). Third, the order of these items importance is different between the three samples which will be discussed next.

The most important item among those loaded to this factor is the ease of browsing the system. As it was briefly discussed earlier in this chapter, this item could be part of the system design attributes. While this item was present in both the academic staff and experts' data analysis results, it has been, nonetheless, ranked as the second most important item in both cases. In comparison with the literature and from students' point of view this item has been investigated by Selim (2007a), Masrom et al. (2008) and Musa and Othman (2012). Selim (2007) results ranks ease of browsing in the fourth place among 13 technology related item they have investigated which gives it a relatively high importance. Masrom et al. (2008) has two items which focus on error free and satisfactory browsing and they were rated as second and third most important items in the technology and support category. Lastly, Musa and Othman (2012) research has included about five items which all focus on the ease of browsing, the speed of it, being error free, and being easy to use. All these items were ranked as the highest items in the technology related items category.

The second most important item that is loaded to this factor is the easy access to internet which is related to the first most important item as they go hand in hand; thus, easy access to the internet can help achieving easy browsing. This item was also present in both academic staff and experts results and it was ranked as the most important item by both respondents' groups. This item was also present in several related research works (e.g. Selim, 2007; Masrom et al., 2008; Musa and Othman, 2012). Selim's (2007a) results place easy access to the internet as the most important item among the 13 technology related items they have investigated. In Masrom et al. (2008), easy on-campus access to the Internet was placed as the third most important item among 13 items they have studied. It was mentioned in Chapter Two that there is a high similarity between Selim's (2007a) and Masrom et al.'s (2008) categorisation of factor and their associated items. Musa and Othman's (2012) results agree with those of Selim (2007a) and place easy access to the internet in the most important position. In conclusion, there an agreement between the results of this project and the relevant literature on how important it is to have a reliable and easy access to the internet in order to contribute to the success of using the e-learning system.

The least important items loaded to this factor according to the students' perspective is the availability of online communication tools. This agrees with the results of the academic staff and experts as they both placed it in the least important position. Literature wise, the availability of communication tools in general has been emphasised by several authors (e.g. Selim, 2007a; Masrom et al., 2008; Menchaca and Bekele (2008). Selim (2007a) considered two items which focused in communications between the students themselves and the students and their instructors. These two items were placed in the fourth and sixth most important places respectively. The same two items have also been considered by Masrom et al. (2008) and they were ranked as the eleventh and the fourth most important items. Menchaca and Bekele (2008) have emphasised the high importance of making communication tools available according to all the investigated perspectives.

8.4.2 Instructor' Characteristics

The second most important factor according to the students is the instructors' characteristics. Instructors' characteristics is another factor from the mutual factors between all the investigated groups. While being placed as the second most important by the students, it was placed as fifth and third most important factor by academic staff and experts respectively. Thus, the results of the students' data analysis are closer to those of the experts than to the instructors' themselves. This could a symptom of responsibility shifting by the instructors towards other factors.

Instructors' characteristics have also been investigated in the literature from students' point of view (e.g. Selim, 2007; Mosakhani and Jamporazmey, 2010; Taha, 2014; Abdel-Gawad and Woollard, 2015). Both Mosakhani and Jamporazmey (2010) and Selim (2007) state that the students considered Instructors' characteristics as the most vital for the success of an e-learning system. Taha (2014) also emphasise he students' opinion about how important instructor' characteristics impact on how they view the e-learning system. Finally, Abdel-Gawad and Woollard (2015) place the second position of importance is the instructors' characteristics.

This factor had seven items associated with it in the original set of factors. As Figure 8.8 shows, these items have dropped to three only in the final CFA results. This is in comparison to academic staff results which maintained five items and the experts' results which maintained three items loaded to the instructors' characteristics. The three items loaded to this factor ordered by their importance are the instructor's enthusiasm while teaching using e-learning tools, instructor's ability to motivate the students to use the eLearning system and the clarity of instructor's explanation of the eLearning components. Being enthusiastic while teaching using the e-learning system has been was present in the academic staff results in the third most important place out of four items loaded to the factor and it was missing in the experts' data analysis results. In the literature, several authors have considered this item from students' perspective. For example, Selim (2007a) has given this item the lowest place of importance among 13 instructors' characteristics he has considered. Mosakhani and Jamporazmey (2010) results have placed this characteristic in the fourth most important place. Musa and Othman (2012) have studied this characteristics under students' characteristics and it was ranked as the most important among 23 characteristics.

The second most important item under this factor is the instructor's ability to motivate the students to use the eLearning system which was present in both academic staff and experts' results. Academic staff results agree with the students' results on the level of importance of this item by placing it in the second most important item. Experts, nevertheless, place it in a lower position.

Selim (2007a) places this item in the fifth most important position among 13 total instructor's characteristics he investigated. Menchaca and Bekele (2008) discusses students' motivation as a form of encouraging them to accept the change in the learning style and it is ranked in the third most important place under pedagogic strategies category. Mosakhani and Jamporazmey (2010) also investigate this item and place it in the second most important position. Apart from Selim's (2007a), the other two authors results are relatively in agreement with this research results in regard to this item.

The least important item among those loaded to this factor is the clarity of instructor's explanation of the e-learning components. This item also has been present in both academic staff and experts data analysis results, however, there is a disagreement between the three groups of respondents on the rank of its importance. While students have ranked it as the least important, academic staff placed it in the most important position and the experts put it in the middle or second most important position. As the instructors play a major role in facilitating the learning through the system, this characteristic has also been considered by researchers such as Selim (2007a) and Puri (2012) from students' perspective. Selim's (2007a) emphasised this role through studying several items or characteristics, however, the instructor capability of explaining the e-learning components was ranked as the third most important characteristics among 13 instructors' characteristics he has considered.

8.4.3 Students' Characteristics

The third most important factor from students' perspective is their own characteristics. Students characteristics is one of the mutual factors among the three samples and it was ranked as most important and least important factor by academic staff and experts respectively. In the literature, students' characteristics factor has been studied from students' perspective by (e.g. Selim, 2007; Mosakhani and Jamporazmey, 2010; Musa and Othman, 2012). The student respondents in Selim (2007) have considered their characteristics as the least important factor while they ranked it as the third most important in Mosakhani and Jamporazmey (2010) research. Moreover, between students' characteristics and technology infrastructure, the students' respondents have placed it in the second most important factor in Musa and Othman (2012).

In comparison with the initial factor, students' characteristics has lost only one of its original associated items. The final five remaining items include all those of the ones remained in the academic staff and experts' results. This could be attributed to the fact that the students know what matters to them the most. The five items that remained loaded to this factor are the student's ability to find things in eLearning system, the student's understanding of the purpose of different parts of the eLearning system, the student's experience and knowledge about computers, the level of the student's enjoyment while using technology and the student's willingness to participate in e-learning.

The student's ability to find things in e-learning system is related to his or her technical ability to accomplish the search task. This item was also maintained in the academic staff results and it was ranked as the most important item among the two maintained items in those results. However, it failed to pass the EFA and CFA test in the expert data analysis. In the literature, the students' technical skills were emphasised as an important part of his success in using the e-learning system. For example, Selim (2007) ranked the student ability to navigate the e-learning system and find resources characteristic as the second most important among 22 different student s' characteristics he studied. Mosa and Othman (2012) have placed this ability in the fifth position of importance among total of seven characteristics of student's content they have studied.

The second most important item is the student's understanding of the purpose of different parts of the eLearning system. This an important characteristic that is believed to affect the student's performance when using the e-learning system in general. This characteristic has failed to pass the EFA and CFA test in both academic staff and experts data analyses. In the literature, however, it has been investigated by Selim (2007a) who placed it in the seventh most important place among 22 different students' characteristics he has considered. On the other hand, Musa and Othman (2012) found that their student respondents have given the sixth position of importance among seven students' content characteristics they asked they asked them to rank. The third and one of the most echoed students' characteristics in the literature is the student's experience and knowledge about computers. Despite it importance as it will be presented shortly, this item has failed EFA and CFA tests in the academic staff and experts' data analysis. This item was investigated by Selim (2007) through four different characteristics which all focus on how confident the student with technology and how that affects his e-learning experience. These four items were ranked among the top six characteristics according to the students' respondents and they were given slightly lower ranks in Musa and Othman (2012). Enjoying using the technology in general and e-learning in particular also affect the success rate of the e-learning, according to the student respondents. Nevertheless, the academic staff and expert do not agree with this which is evident by fourth most important item loaded the students' characteristics being dropped in their data analysis results. However, Selim's (2007) and Musa and Othman's (2012) results agree with those of the students' in this research as they rank the student's level of joy as the eighth and sixth most important student's characteristic. The least important student's characteristic according to the students themselves is their willingness to participate in e-learning Interestingly, this characteristic was present in the experts' data analysis results and it was given highest rank; however, it failed to pass academic staff EFA tests. Students' attitude towards e-learning and their willingness to participate in e-learning based education has been discussed by Selim (2007a), Menchaca and Bekele (2008), Musa and Othman (2012) and Puri (2012). According to Selim (2007) having a positive attitude toward e-learning and participating in the ongoing discussions by the students is highly important for the success of e-learning system. His results placed this item in the ninth most important position among 10 items that focused on the student's computing characteristics. Musa and Othman (2012) also followed Selim's (2007a) approach in selecting which characteristics to investigate. They have concluded that the positive attitude towards e-learning and that it encourages the student to learn better than traditional learning is in the fifth most important position among 10 items that focused on the student's computing characteristics. Menchaca and Bekele (2008) have also discussed similar characteristics under the wider category of accepting change of learning approach by the students. They associated this characteristic with motivation, both from the instructors and by the students themselves. Change was discussed under pedagogic strategies category which was placed as the second most important categories of issues that affect the e-learning system success. Students' commitment to using e-learning has also been discussed and ranked by Puri (2012) who listed it under pedagogical category which made up of the most important items that impact the e-learning system success. Student' commitment was ranked as the sixth most important item among a total number of seven items associated with this factor.

8.4.4 e-learning Sources

In fourth place of importance is the e-learning sources which is a new factor that appeared due to the performance of EFA and confirmed through the execution of CFA. This factor is new to the students' results and it was not present in either academic staff and experts' results. As a new factor, it is not possible to compare it with the literature, however, the five items loaded to this factor come from the originally proposed e-learning resources factor, therefore, these items are a good way for literature comparison.

The five items are loaded to this factor are the availability of online test/quizzes, the availability of communications with the instructor in the e-learning system, the course interactivity, the measurement of learning progress, and whether the learning material is up-to-date.

Online tests/quizzes are means of evaluating the students' progress just like traditional paper-based exams. This item seems to have an agreement between the three studied samples in terms of its importance, although it was loaded to different factors in both academy staff and experts' data analysis results. The availability of online tests/quizzes has been investigated from students' perspective by Puri (2012). His results have placed this item as the second most important among three items loaded to the evaluation factor which in itself was ranked as fourth most important factor among a total of six factors the research has focused on.

Communications in general is one of the pillars of the e-learning system as most of the tasks are done from a distance between the involved parties, whether they were between students communicating with their peers or communicating with their instructors. High importance has been argued for the importance of these communications both as an action of communicating and as a necessity that the e-learning system should provide the means for these communications to happen. The second most important item loaded to e-learning sources factor is the availability of communications with the instructor in the eLearning system. Selim (2007), for example, found that the students placed a lower importance on communication with the instructor when they placed that item in the 10th most important place from a total of 13 items that were asked to rank. Masrom et al. (2010), on the other hand, found that the students have given a higher rank for the same item when they placed it in the fifth most important place, out of the same 13 items ranked in Selim's (2017) work.

Musa and Othman (2012) results agree more with those of Selim (2007) as this item was ranked in the 12th position of importance.

The course interactivity item is the third most important among the five items associated with the e-learning sources factor. Course interactivity was present in academic staff and was dropped in the experts' data analysis results. Academic staff have given this item the highest importance among the two final items that were loaded to the experience factor. The results of Menchaca and Bekele (2008) show more agreement with academic staff results than with those of the student when their respondents repeatedly indicated that multiple interactive tools were crucial in creating successful e-learning system. Musa and Othman (2012), however, shows that the students gave the level of interactivity on the website a medium range importance (5th out 13 items measuring technology).

It was discussed in this subsection that measurement of learning progress is an important part of the e-learning for it to imitate the traditional learning systems. The most important item associated with this factor was the availability of quizzes and online tests. A more generic item which focuses on a broader sense of students' learning progress is the availability of tools, activities, and maybe policies which help measuring that progress. This is the fourth most important item loaded to the e-learning sources item according to the students' perspective. Checking Figures 8.4 and 8.6 shows that this item has been dropped in both academic staff and experts data analysis results. FitzPatrick (2012) places the availability of means to measure students' attainment in 14th position of importance among 30 items he has evaluated. Puri (2012) also investigate different items all covered by the evaluation factor this factor was placed in the fourth most important position among a total number of six factors. The least important item loaded to the e-learning sources is whether the learning material is up-to-date. This item has been dropped in both academic staff and experts' data analysis results. The updatability of the information provided on the e-learning system was considered by several authors from students' point of view. For example, FitzPatrick (2012) has shown that the students in his research ranked having up to date information as the sixth most important item among the 30 he has evaluated. Mosakhani (2010) also emphasize the importance of keeping the learning material recent and relevant. Taha (2014), on the other hand, focuses on the generic concept of content quality and how important it is to pay attention to it as it can highly affect the users' satisfaction with the e-learning system as a whole.

8.4.5 Support and Training

The fifth important factor according to the students' perspective is the support and training. This mutual factor among all the respondents' groups was one of the originally proposed set of factors. Support and training, as mentioned in the previous sections, is one of the most investigated factors in the literature as the outcomes of it can affect the whole experience the users have with the e-learning system. While experts have clearly given this factor a high importance level by placing it as the second most important factor, comparing the importance rank of this factor in students' results with the rank of the same factor in academic staff results shows some interesting similarity. As it clear from Figure 8.8, the students have placed it in the fifth place, academic staff have given it the seventh position. Thus, both groups of respondents have given a relatively low ranking for this factor, still, both have placed system access below it. Support and training has been ranked as the least important by the students in FitzPatrick (2012) research. Leadership factors which included support and training item was ranked as fourth most important factor by Menchaca and Bekele (2008). Moreover, Selim (2007) also shows similar results when students rank the support factor in the seventh and least important position of importance. Thus, the results of this research are close to the those in the literature.

Three items are loaded to this factor and they are availability of training, availability of online help desk and availability of offline technical support. Availability of training was present in both academic staff and experts' results. In the academic staff results, availability of training was loaded to the support and training factor but placed in the least important position. On the other hand, in the experts' data analysis results, availability of training was loaded to support and training (2) and was placed as the most important item loaded to that factor. Availability of training was also discussed in the literature from students' perspective. Training of eLearning, for example, was ranked by students as the 10^{th} most important item by students in FitzPatrick (2012). Puri (2010) results have ranked Training for students/staff as the least most important items among the five items loaded on the institutional administrative affairs factor. Menchaca and Bekele (2008) have listed training under the leadership category of items and they emphasised its importance.

The second and third most important items loaded to this factor are availability of online help desk and availability of offline technical support. These two items summarise a wide range of items that have been discussed in the literature and they all focus that the users can reach and ask for support in case of technical troubleshooting or for general help enquiries. The availability of online help desk evidently important for the three groups of respondents as it was present in both academic staff and experts' data analysis results as well. Academic staff have given this item the highest place of importance among the total three items loaded to the training and support factor while experts have given the lowest place of importance among the two items loaded to the support and training (2) factor. On the other hand, the availability of offline technical support was totally dropped from both academic staff and experts' data analysis results.

The ability to get help from the technicians has been ranked as fourth most important item among five support related items evaluated by Selim (2007). The provision of IT support for both teachers and students has been ranked as second most important item according to Puri (2010). Getting technical support from technicians has also been ranked as most important by Masrom et al. (2008).

8.4.6 System Access

Another factor that is mutual among all the results sets is the system access. System access was placed in the sixth and fourth places of importance by academic staff and experts respectively; this shows a relative agreement between the different groups of respondents on the importance of this item. As it was mentioned earlier in this chapter, this factor is not one of the originally listed five factors therefore comparing it with the relevant literature as a factor; however, in similar case to the e-learning sources factor, the items loaded to this factor come from originally proposed e-learning resources factor which makes them a suitable way for comparison. Two items are loaded to this factor; ease of registration on e-learning course and access to the e-learning sources on and off campus. Both of these items were present in the academic staff data analysis but they also were dropped from experts' data analysis results. In the academic staff results, the ranking of these two items is identical to that in the students'.

From students' perspective, ease of registration on e-learning course was investigated by Masrom et al. (2008) and it was ranked in the seventh most important position out of 13 technology related items. Similarly, Musa and Othman (2012) ranked a similar set of items and ease of registration on e-learning course and it was ranked third most important item among the 13 they evaluated. Selim (2007) results are similar to those of Musa and Othman (2012) as this item was ranked in the second most important position. Access to the e-learning resources on and off campus has also been studied from students' perspective. The result of Selim (2007) and Masrom et al. (2008), and Musa and Othman (2012) have ranked accessing online resources and the students' ability to locate resources online as the first and fourth most important items among five technology related items they have evaluated.

8.5 Comparison with Saudi Focused Literature

In Chapter Two, four studies were discussed within the research on e-learning CSFs in a Saudi context. These fours studies were presented by Fryan and Stergioulas (2012), Al-Tameem (2005), Al-homod and Al-shafi (2012), and by Naveed et al. (2017). Considering these results of data analysis presented in this chapter in light of these studies shows that in most of the cases it is hard to run a clear comparison of these results. For example, in the case of Fryan and Stergioulas (2012), such a comparison is not possible due to two issues; first, Fryan and Stergioulas (2012) have not clearly specified the nature of the sample other than stating that they were selected on the condition that they have a relevant job to the research. Considering that the samples used in this thesis were either academic staff or experts, it is hard to decide to which sample's results the work of Fryan and Stergioulas (2012) should be compared. The second issue with Fryan and Stergioulas's (2012) work is that they have listed the 52 items they have considered associated with five categories, however, they did not mention any form of importance order of these categories or items.

The case when attempting to compare the work of Al-Tameem (2005) is slightly different. The author has specified the sample as IT managers and project managers as his sample to conduct semi structured interviews which can be comparable to the experts' results in this thesis; however, he did not associate any items with the four categories (IT infrastructure, security, access (on-site and off-site), and IT support). Moreover, there was no order importance provided in the results.

In Al-Homod and Al-Shafi (2012), the main focus of the research was the technical side of the e-learning system therefore, the authors chose to collect data from engineers in Saudi universities which makes it not possible to compare his results with the results of any sample of the used in this thesis.

The study presented by Naveed et al. (2017) has all the components to make it comparable to some of the results presented in this chapter. They have considered five factors with 36 items associated to them, clearly specified the sample as 247 academic staff, and they have provided an importance order for the 'dimensions' and the loaded items considering that they have used EFA; thus, in comparison with the academic staff results presented in Section 7.3.3 of Chapter Seven of this thesis, academic staff in Naveed et al. (2017) have considered 'system and technological dimension' is most important factor among the five considered factors. System and technological dimensions highly comparable to the technology infrastructure factor in this thesis. As it was discussed in section 8.2, academic staff have considered students' characteristics to be the most important factor. Academic staff in in Naveed et al. (2017) have placed institutional management as the second most important dimension; they have also considered instructors' characteristics and design and contents dimensions in the third place (same mean value). Interestingly, students characteristics dimension which was considered as most important factor by academic staff in this thesis has been considered as the least important dimension by academic staff in in Naveed et al. (2017).

8.6 Summary and Conclusion

On the basis of the data analysis presented in Chapter Seven, this chapter has widened the comparison of these results with relevant literature. The chapter was organised based on the sample and discussed each factor and the items loaded to factors and checked them against the same perspective as was investigated by other researchers. From the results discussed in this chapter, some conclusions can be drawn. First, the majority of the final e-learning CSFs found in this chapter are actually mutual between the different investigated perspectives and with the relevant literature. Second, despite the mutuality of the majority of the items and the factors loaded on them between the samples, there are differences in the level of importance each sample has given different factors and associated items.

Considering this, it can be emphasised that students' characteristics, instructors' characteristics, technology infrastructure, support and training and system access are the most important factors that the decision maker should focus on when designing and adopting an e-learning system. In particular, special attention should be paid to employing reliable technology, focused training programmes, and interaction between instructors and students.

CHAPTER 9: CONCLUSION AND FURTHER RESEARCH

9.1 Introduction

The huge expansion in using technology in general has promoted the use of many new technologies in the field of learning. The e-learning concept has been coined to reflect this usage. There are many advantages that e-learning systems can offer to enhance education including the ability to abolish the need for the students to travel, the ability to tailor for specific student's needs, and improving students' thinking skills. One of the main advantages of e-learning is the shift from educator-centred learning to student-centred learning.

Since early 2000s, the expansion in using technology in education has pushed for academic researchers to investigate the factors that have higher impact on the success of implementing and adopting e-learning system. The main focus of these investigations is the factors which are critical to pay attention to in order to make an e-learning implementation more successful. This was due to the many failures that these systems have faced worldwide. Several researchers have attempted to answer this question in different contexts and following different approaches. These investigations should focus on different e-learning stakeholders groups; for example, academic staff, students, and technical support staff. However, reviewing the literature has shown that there is a lack of similar studies, especially, a Saudi context. Saudi Arabia is an example of the growing new markets for e-learning technologies where adoption of these technologies is highly supported by the government and huge amount of resources are invested to integrate these systems as part of the education system. Very a few studies (e.g. Fryan and Stergioulas 2012; AlTameem, 2005; Alhomod and Alshafi; 2012; Naveed et al., 2017) have investigated e-learning CSFs in a Saudi context. All of these studies were limited in their scope or the stakeholder group they have investigated or both. While some of them (e.g. Fryan and Stergioulas 2012) didn't specify the exact user group perspective they are investigating other than being e-learning professionals, they also did not provide clear order of importance of the factors and items they have considered. Other (e.g. Al-Homod and Al-Shafi) failed to investigate some of the important viewpoint of e-learning users (e.g. students and academic staff). Naveed et al., (2017) was the only study that investigated academic staff perspective and provided clear order for the factors and the associated items; however, Naveed et al., (2017) focused on academic staff only.

The current project aimed to solve all these issue by considering three main viewpoints of three different stakeholder groups (academic staff, experts, and students) in a Saudi context which lack any similar study. This allowed the researcher to develop a better understanding of the e-learning CSFs and run a comparison between their three different viewpoints. Moreover, considering the researcher’s career as an academic in one of the main Saudi universities (King Saud University), experience, and interest, filling this gap in the literature and practice has gained his attention; thus, this research project has focused on offering insight on the development, adoption, and the identification of the factors which are considered to be more important by the users’ groups than others in affecting the success of an e-learning system from three main e-learning systems users’ groups in a Saudi context. On the bases of this research, a comparison between its results and the results of similar studies conducted in other contexts was made possible.

This chapter is organised as follows. The second section focuses on giving an overview of the research. The second section presents the main contributions to the e-learning field knowledge, and any other relevant fields. The third section presents the lesson and implications concluded from this research project. Lastly, the fourth section presents the limitations of the research project with some ideas for future research.

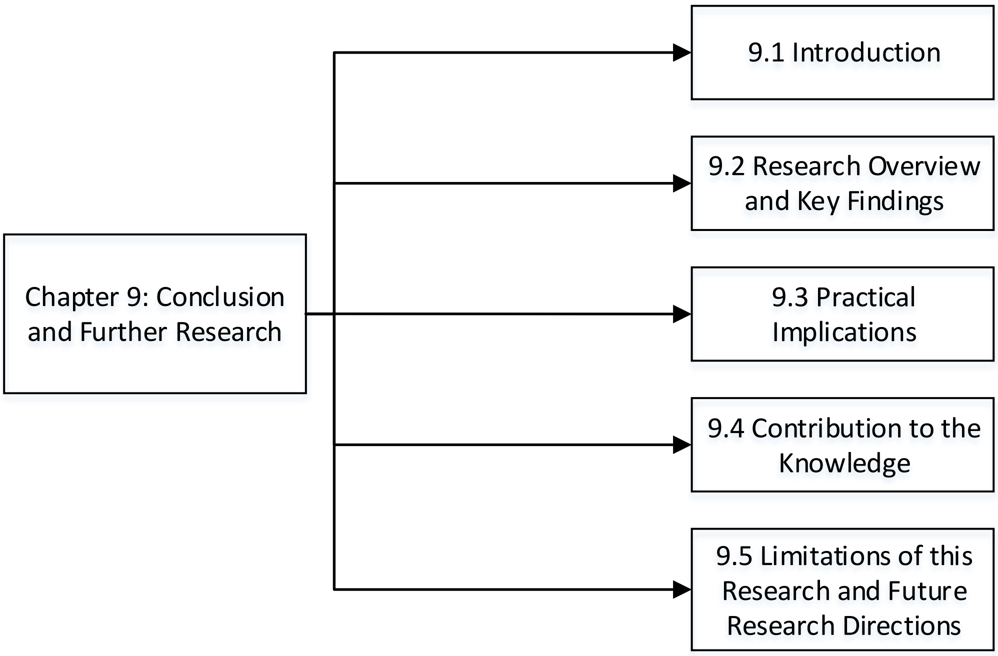

Figure 9.1: Chapter Sections

9.2 Research Overview and Key Findings

The research started by an intensive literature review which was presented in Chapter Two. That literature review helped shaping the interviews which were conducted with e-learning experts to allow the researcher to explore the current status of e-learning In Saudi Arabia. The experts which were interviewed at that stage were employed by three major Saudi universities and played important roles in shaping the e-learning system in these universities. The data collecting using the semi-structured interviews were analysis following thematic analysis approach. The main findings of that early investigation showed that the interviewed experts have ranked the suggested factors from most to least important in the following order: instructor factors, student factors, learning environment factors, instructional design factors, and support related factors. More specifically, it is evident that instructor factors are ranked 1 or 2 by six of the seven interviewees, and student factors are ranked 1 or 2 by five of the seven interviewees. There is a little more variation on the relative ranking of the learning environment factors, but there is a general agreement that both instructional design and support related factors are, relatively less important.

On the basis of these results which deepened the understanding of e-learning systems current status in Saudi Arabia, the literature review was developed further, and was then used as a base to design questionnaires to collect data from a wider population of e-learning system users. The original proposed set of factors contained five factors (instructor's characteristics, students' characteristics, technology infrastructure, eLearning systems and Online learning resources, and support and training). Moreover, in the initial stage, the total number of items associated with these factors was 37 for academic staff and experts and 36 for students. These questionnaires were used to collect data from a sample of academic staff, students, and experts. King Saud University (KSU) was chosen as a case study to collect the data from. KSU is one of the largest and oldest universities in the Kingdom of Saudi Arabia and it is believed that it can be a representative case for similar Saudi Universities. Chapters Seven and Eight focused on presenting and discussing the results of analysing the collected data from the three samples using EFA and CFA.

Those findings have shown that initial set of suggested factors have been mostly maintained in all samples results; however, some new factors have been added and the old association of some items to certain factor has been amended to reflect the differences between the investigated perspectives.

The academic staff results showed that three additional factors were added and the final set of items loaded to these factors were reduced to 23 items. Moreover, academic staff have considered that the students' characteristics to be the most important factor among the new eight factors while e-learning sources, which is a new emerging factor to be the lowest factor of importance. In comparison, experts have considered the experience factors, which is also another factor that emerged as a result of conducting EFA and CFA, to be the most important factor. The experts also considered the students' characteristics as the least important factor. The total number of the final factors emerged from the experts' data analysis is seven, five of which have been originally suggested by the researcher and two that have emerged as a result of the data analysis. Moreover, the total number of items that are associated with these seven factors is 18 items. The students' results have shown that their top priority of importance was given to technology infrastructure while the least important position was given to system access, which another new factor. The total number of items loaded to the students' six factors is 21 items. The similarities and differences between the results of these samples have been described in Chapter Seven. In brief, there are clear differences between the samples in giving the degree of importance to the different factor. They also differ in some of the items loaded to certain factors. The similarities also present. For example, the data analysis results show there are five mutual factors. Chapter Eight showed how different and similar this research result to the relevant literature. Figure 9.2 and Table 9.1 summarises the final findings of e-learning CSFs and their associated items; they also specify what level of importance each sample gave to a certain factor or item.

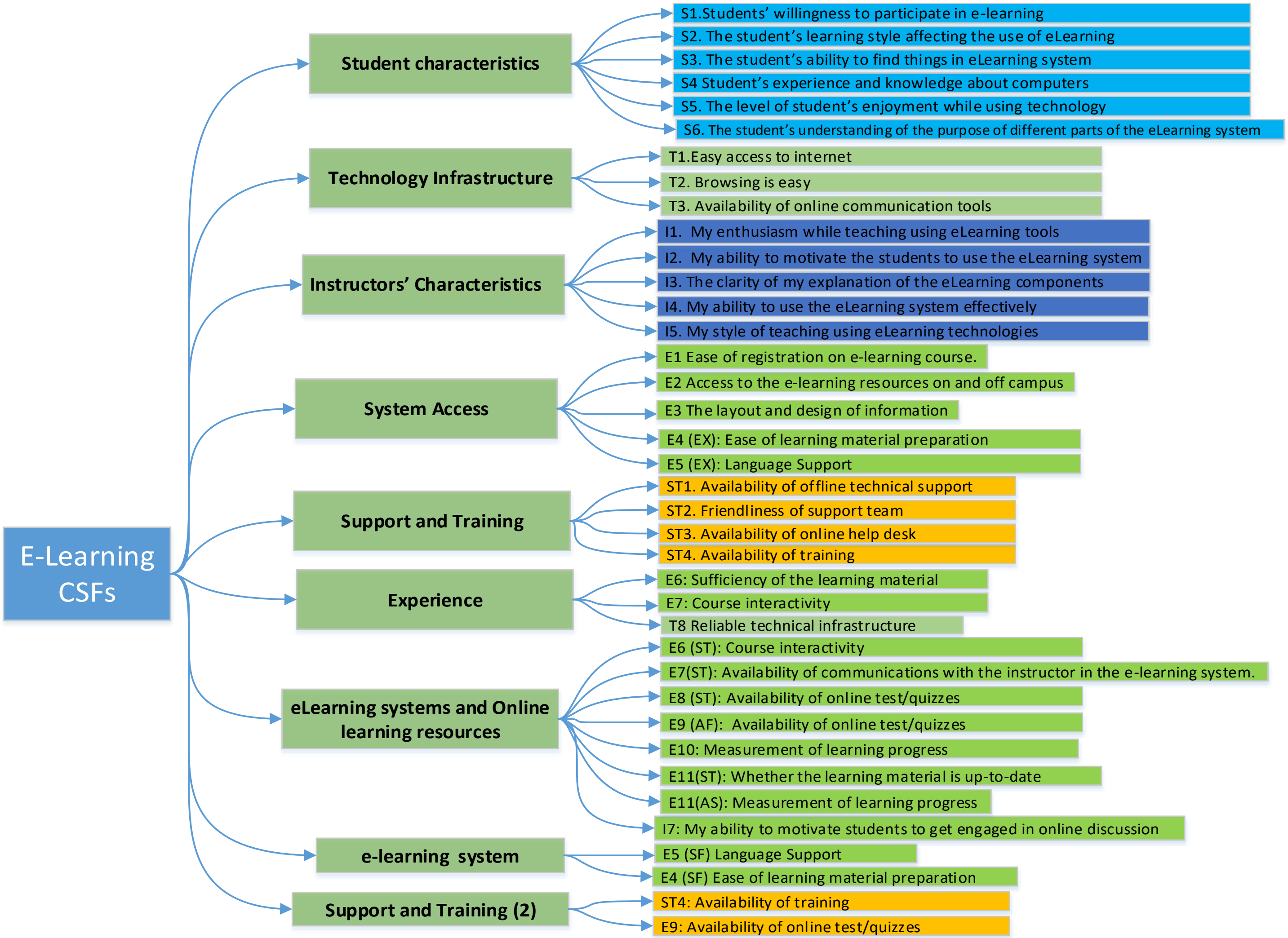

Figure 9.2: Final e-learning CSFs

Figure 9.2 is further explained in table 9.1 below.

Factors	Factor Order			Items	Item Order		
	Academic staff	Experts	Students		Academic staff	Experts	Students
Student characteristics	1	7	3	S1: Students willingness to participate in e-learning		1	5
				S2: The student's learning style affecting the use of e-learning.		2	
				S3: The student's ability to find things in eLearning system	1		1
				S4: Student's experience and knowledge about computers	2		3
				S5: The level of my enjoyment while using technology.			4
				S6: The student's understanding of the purpose of different parts of e-learning system.	3		2
Technology Infrastructure	4	5	1	T1: Easy access to internet	1	1	2
				T2: Browsing is easy	2	2	1
				T3: Availability of online communication tools (e.g.-mail)	3	3	3
Instructor characteristics	5	3	2	I1: My enthusiasm while teaching using eLearning tools	3		1
				I2: My ability to motivate the students to use the e-learning system.	2	3	2
				I3: The clarity of my explanation of e-learning components.	1	2	3
				I4: Instructor ability to use the e-learning system effectively		1	
				I5: My style of teaching using e-learning technologies.	4		
System access	6	4	6	E1: Ease of registration on e-learning course.	1		1
				E2: Access to the e-learning resources on and off campus	2		2
				E3: The layout and design of information	3	2	
				E4: Ease of learning material preparation		1	
				E5:Language support.		3	
Support and training	7	2	5	ST1: Availability of offline technical support		1	3
				ST2: Friendliness of support team	2		
				ST3: Availability of online help desk	1	2	2
				ST4: Availability of training	3		1
Experience	3	1		E6: Sufficiency of the learning material		1	
				E7: Course interactivity	1	2	
				T8: Reliable technical infrastructure	2	3	

Factors	Factor Order			Items	Item Order		
	Academic staff	Experts	Students		Academic staff	Experts	Students
e-learning sources	8		4	E6 (ST): Course interactivity			3
				E7(ST): Availability of communications with the instructor in the e-learning system.			2
				E8 (ST): Availability of online test/quizzes			1
				E9 (AF): Availability of online test/quizzes	3		
				E10: Measurement of learning progress			4
				E11(ST): Whether the learning material is up-to-date			5
				E11(AS): Measurement of learning progress	1		
				I7: My ability to motivate students to get engaged in online discussion	2		
e-learning system	2			E5 (SF): Language support	1		
				E4 (5): Ease of learning material preparation	2		
Support and training (2)		6		ST4: Availability of training		1	
				E9: Availability of online test/quizzes		2	

Table 9.1: Final e-learning CSFs

9.3 Practical Implications

The results presented in Chapters Seven and discussed in Chapter Eight can be used as a guidance to identify some of the main issues and components of a system that an e-learning implementation team should pay close attention to in order to increase the chances of that system's success. These lessons can be summarised as follows.

a. Developing and employing high quality technology

Considering that this whole research is about e-learning system, then technology is the corner stone of it; without it, there is no such thing as e-learning and with the right employment of it, the chances for a successful e-learning system are much higher. Technology in this sense include both the actual e-learning system as user interfaces, communication tools, etc. and the reliable technology infrastructure that supports that system and allows it to properly operate. Those two levels of technology deployment have been given high level of importance by the three investigated perspectives as shown in Chapters Seven and Eight. This is particularly true from students and academic staff perspectives. This technology should be characterised as reliable, available, fast, expandable, offers continuous and reliable communications between the different users' groups, and easy to use. The planners and implementers of an e-learning system should focus on investing enough resources to make sure that the employed technology matches if not exceeds the users' expectations as it significantly affects how they view and therefore use the system. To achieve this, decision makers should consider investing in technologies that are customisable, allow mobile access to the e-learning resources, and are reliable, up-to-date, and easy to learn. Moreover, the design of the system together with the learning content should be sufficiently interactive to motivate the users to use the e-learning system.

b. Providing a supportive environment

The continuous usage and growth of using and expanding e-learning technologies requires continuous support to be provided to the users for them to overcome the issues they face. The support in this sense could be available on two levels; first, to enhance the technical skills sets of the instructors who can operate as technical and educational support team for the students; second, to make actual technical support available both online and offline.

Achieving the first level of providing the supporting environment can be achieved through planning and implementing the suitable training programmes for the instructors; this will be emphasised further in section 'd' below.

For the second level of providing a supportive environment should be a main part of planning and implementing an e-learning system. This could be achieved through the planning of the hiring highly qualified support personnel who are able to provide troubleshooting and technical support for all levels of users. These personnel should be available to contact as much as possible considering that the e-learning system is accessible 24 hours, 7 days a week, and 365 days a year. If that is not possible, another alternative is to implement an online help desk which does not have to exist in a certain physical location but can be accessible through electronic communications. This recommendation is highly important for the success of the e-learning system as the users can be put off using the system if they face technical troubles that they can not solve and they do not receive the adequate support to solve it.

c. Supporting a higher levels of communication between students and instructors

Another basic component of a successful e-learning is the communication between the different parties involved in the process. In particular, communication between students and instructors is of immense importance in the light of the lack of physical attendance by the students in physical classrooms. The purpose of these communications could be educational, for technical support, or even social to enhance the working relationship between the students and the teachers. In common with other studies, this research has shown that the respondents from the three samples appreciate the importance of communication, by giving high priorities to the items that focus on these communications. This is particularly true for students and academic staff. The desired communications could also be reflected in the relationship between the students and the instructor as in the form of human to human interactions. The friendliness of instructors and their attitude to the students and to the e-learning in general have also been emphasised to be important factors that impact the success of the e-learning approach in general and in the e-learning system in particular. There are many ways to achieve this goal or to fulfil this recommendation. These include developing the communication skills of the instructors, and employing suitable technologies such as instant chatting applications, electronic forums, and electronic mail agents.

d. Developing and allowing the growth of higher quality of training programmes and human resources

One of the most important components of any learning and teaching processes is to employ qualified instructors. The qualification of instructors could be further enhanced through the development of training programmes that focus on the skills and areas of expertise that matter the most for the success of the educational processes. This pillar is believed to be even more essential when adopting an e-learning approach for education considering the amount of technicality and communications involved for the processes to be a successful one. Training should not be limited to academic staff; students, management staff, technical support staff, and any other involved parties could also benefit from training programmes. The results presented in Chapter Seven and Eight have shown that the availability of training was considered among the e-learning CSFs by all the three groups of respondents. One of the main focus areas where training programmes and investments should be directed to is technology competency. Such programmes could be directed to all the parties involved in the e-learning process but in particular to the academic staff and students. In the case of the academic staff, their technology competency will not only affect their level of usage of the e-learning system but it will also affect their abilities to clearly explain the different components of the system to their students. It will also affect their abilities to assist and support the students in resolving any technical issues they might face while using the system. Importantly, students' enjoyment level whilst using the e-learning system is related to their level of mastery the technology and can therefore affect their learning outcomes and achievements.

e. Providing high quality content

In all forms of learning, whether it was traditional or e-learning based, the contents or learning materials are one of the most important components of any learning system. The results of this research project and other relevant research works have highly emphasised on integrating learning materials that are relevant, searchable, and up to date.

As it was shown in Chapters Seven and Eight, the three samples have considered some of the contents characteristics to be important and have impact on the success of the e-learning system. Some of these characteristics include that the learning contents should be available to access for the users, both on and off campus, depending on the nature of their e-learning system usage. The learning contents should also encourage the users to use the system more often by being integrative, easy to locate, searchable, suitable for learning styles and their level of technical competency and academic knowledge.

There are different approaches that can be employed to achieve this. For example, the e-learning system implementation team could rely on designing a customisable e-learning contents that can be tailored to the individual student's or instructor's learning needs, abilities, and learning style. This requires the development of a whole e-learning system from scratch or to customise a commercially available e-learning system that has the potential to fulfil the needs of the different types of users. In both cases, the results of this thesis and similar work are important as they can guide the decision makers on what system to build or customise.

The interactivity characteristics of the e-learning systems have also been highlighted in different places in Chapters Seven and Eight and can be implemented on both the contents and communication levels. Contents should be implemented in a way that keeps users engaged with the system; the employment of new technologies (e.g. touch screens, mobile apps, etc) can help achieving this goal. Moreover, the availability and implementation of communication tools in a way that helps creating a sense of community between the students and between them and the instructors to discuss the learning contents or any other issues relevant to the learning process.

Another aspect which can be applied in an e-learning environment is that over time and through accumulation, the system could contain some form of contents database that help the users find what they need even if it from previous semesters or from outside the official curriculum.

What matters is that the system should form a comprehensive environment that offers the users all the learning contents that not only help them to learn but to eventually attract them to learn more.

9.4 Contribution to the Knowledge

The starting point for this research was the lack of the adequate research to identify e-learning CSFs in a Saudi context. The existing research (e.g. Fryan and Stergioulas, 2012; Al-Homod, 2013; Al-Asmari and Khan, 2014) has either considered some of the potential perspectives or a subset of the potential factor and items. By surveying the literature, conducting and initial investigation, then conducting a more comprehensive investigation that covered three main perspectives, this research project is believed to have contributed to knowledge in two main ways.

First, the results of this research project provide a scientific evidence that can guide and help the decision makers through the process of identifying areas of attention and investment direction to which they should focus on. By confirming the existence of a set of factors and items that has more influence than others on the success and failure of an e-learning system, this research, alongside similar studies, reduces the possibilities of making the wrong decisions or investing in the wrong components or activities carried out during the planning and implementation of an e-learning system.

Second, the results, as described in different places of this thesis, differentiate between what factors that matter to the academic staff to those that matter the most to the experts and students. This is the second contribution of this research project which is the identification of users' centred e-learning systems that are customised according to these users' needs and priorities.

9.5 Limitations of this Research and Future Research Directions

This research project has attempted to develop as comprehensive investigation concerning the CSFs of an e-learning system; however, considering the limitations in time and human resources, this research project has some limits that could guide some future discretions of research. First, the main research was conducted using quantitative methods; while the results have revealed some important indicators, nevertheless, these results could be enhanced even more if further interviews were conducted, especially with experts and academic staff. Secondly, the initial set of factors and the associated items were identified based on the previous research works. As valuable as they are, it is believed that exploring these factors using unstructured interviews, for example, could lead to revealing more factors and items that have not been considered or discovered by other researchers. Third, the main research was conducted in one main university in Saudi Arabia. Conducting the same research in different universities in the Kingdom, or elsewhere in the world, could lead to a national agreement (or disagreement) on e-learning CSFs that can used as stronger base for any future plans to implement new e-learning systems. Fourth, and last, the data analysis has focused on the factors and the associated items as presented in the Chapter Seven; additional data has been collected (e.g. respondents' demographic data) but has not been analysed or employed in the analysis. These data were planned to answer research Question Three, however, as part of future research, analysing these data and linking the results to the obtained results so far can help broaden the understanding of the impact of demographic factors on the importance of the critical success factors for e-learning. For instance it might be useful to explore whether gender impacts on the ranking of CSFs and whether female respondents' results are different from those of the male respondents.

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Appendix 1: Interviews Questions (English Version)

Thank you for agreeing to participate in this preliminary data collection. Please follow the following steps.

1. Please look at the following five pages and then fill the next table according to the importance of each category. For example, if you think the teacher's characteristics are the most important category in terms of its effect on the success of the eLearning system in your institution, then put 1 in the third column. Then put 2, 3, 4, and 5 for the less important categories.

#	Category	Importance order
1	Student Factors	
2	Instructor's characteristics factors	
3	Learning environment factors	
4	Instructor characteristics Factors	
5	Support related factors	

2. In each of the pages and for each factor, follow the same process you have followed for the categories. Put 1 for the most important, 2 for the less important, etc. in the second column.
3. In each of the pages and for each factor, briefly describe how this factor affects the success of the eLearning system in your institution.

a. Student Factors

#	Factors	Importance order	Can you describe the impact of this factor on the success of eLearning system?
1	Students' pace of learning		
2	Level of commitment		
3	Attitude towards eLearning		
4	Level of motivation		
5	Knowledge with computer systems		
6	Demographic characteristics (gender, age, level of academic programme, etc.)		

- Can you briefly explain why you put the most important factor as most important and the least important factor as least important?

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b. Instructor characteristics Factors

#	Factors	Importance order	Can you describe the impact of this factor on the success of eLearning system?
1	positive attitude		
2	office hours more flexible		
3	Knowledge with learning technologies		
4	teaching styles		
5	ability to motivate the students		

- Can you briefly explain why you put the most important factor as most important and the least important factor as least important?

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c. Learning Environment Factors

#	Factors	Importance order	Can you describe the impact of this factor on the success of eLearning system?
1	Learning Management System (LMS)		
2	Technical Infrastructure		
3	Interactive Learning		
4	Access and Navigation		

- Can you briefly explain why you put the most important factor as most important and the least important factor as least important?

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d. Instructional Design factors

#	Factors	Importance order	Can you describe the impact of this factor on the success of eLearning system?
1	Clarification of Objectives		
2	Content Quality		
3	Learning Strategies		
4	Psychology of Learning		
5	Learning Assessment		

- Can you briefly explain why you put the most important factor as most important and the least important factor as least important?

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Appendix 2: Interviews Questions (Arabic Version)

سعادة الدكتور/ المحترم

شكرا لموافقتكم على المشاركة في جمع هذه البيانات الأولية. يرجى اتباع الخطوات التالية: -

1. يرجى إلقاء نظرة على الصفحات الخمس التالية ثم ملء الجدول القادم وفقا لأهمية كل فئة. على سبيل المثال، إذا كنت تعتقد خصائص المعلم هي الفئة الأكثر أهمية من حيث تأثيرها على نجاح نظام التعليم الإلكتروني في مؤسستك، قم بوضع 1 في العمود الثاني. ثم وضع 2، 3، 4، و5 للفئات الأقل أهمية.

#	الفئات	الترتيب حسب الأهمية
1	العوامل المؤثرة على الطلاب	
2	العوامل المؤثرة على المدربين	
3	العوامل المؤثرة على بيئة التعلم	
4	عوامل التصميم التعليمي	
5	عوامل الدعم ذات الصلة	

2. في كل صفحة من الصفحات ولكل عامل، اتبع نفس العملية التي اتبعت فيها توزيع الفئات. ضع 1 مقابل العامل الأهم، 2. للعامل الأقل أهمية، وما إلى ذلك في العمود الثاني.

3. في كل صفحة من الصفحات ولكل عامل، صف بإيجاز كيف يؤثر هذا العامل في نجاح نظام التعليم الإلكتروني في مؤسستك التعليمية.

a. **العوامل المؤثرة على الطلاب**

#	العامل	الترتيب حسب الأهمية	هل يمكنك وصف تأثير هذا العامل على نجاح نظام التعليم الالكتروني؟
1	سرعة تعلم الطلاب		
2	مستوى الالتزام		
3	الموقف تجاه التعليم الالكتروني		
4	مستوى الحماس		
5	المعرفة بأنظمة الكمبيوتر		
6	الخصائص الديموغرافية (الجنس،العمر،مستوى البرنامج الأكاديمي، الخ)		

هل بالإمكان أن توضح لماذا وضعت العامل الأكثر أهمية في ترتيب متقدم وكذلك العامل الأقل الأهمية في ترتيب منخفض؟

b. العوامل المؤثرة على المدربين

#	العوامل	الترتيب حسب الأهمية	هل يمكنك وصف تأثير هذا العامل على نجاح نظام التعليم الالكتروني؟
1	الموقف الايجابي		
2	مرونة ساعات العمل		
3	المعرفة بتقنيات التعليم		
4	أساليب التدريس		
5	القدرة على تحفيز الطلاب		

هل بالإمكان أن توضح لماذا وضعت العامل الأكثر أهمية في ترتيب متقدم وكذلك العامل الأقل الأهمية في ترتيب منخفض؟

c. **العوامل المؤثرة في بيئة التعلم**

#	العوامل	الترتيب حسب الأهمية	هل يمكنك وصف تأثير هذا العامل على نجاح نظام التعليم الالكتروني؟
1	نظام إدارة التعلم LMS		
2	البنية التحتية للتقنية		
3	التعليم التفاعلي		
4	سهولة الوصول		

d. عوامل التصميم التعليمي

#	العوامل	الترتيب حسب الأهمية	هل يمكنك وصف تأثير هذا العامل على نجاح نظام التعليم الالكتروني؟
1	توضيح الأهداف		
2	جودة المحتوى		
3	استراتيجيات التعلم		
4	سيكولوجية التعلم		
5	تقييم التعلم		

هل بالإمكان ان توضح لماذا وضعت العامل الأكثر أهمية في ترتيب متقدم وكذلك العامل الأقل الأهمية في ترتيب منخفض؟

e. عوامل الدعم ذات الصلة

#	العوامل	الترتيب حسب الأهمية	هل يمكنك وصف تأثير هذا العامل على نجاح نظام التعليم الالكتروني؟
1	أدوات الاتصال		
2	مكتب المساعدة		
3	التدريب		

هل بالإمكان أن توضح لماذا وضعت العامل الأكثر أهمية في ترتيب متقدم وكذلك العامل الأقل الأهمية في ترتيب منخفض؟

Appendix 3: Questionnaire – Academic Staff (English Version)

Factors affecting the success of eLearning processes in King Saud University.

Questionnaire for academic staff

Introduction

We would very much appreciate your participation in our research. We are seeking to identify the factors that affect the use and success of e-learning. The first phase of our study involved interviews with key informants in three universities in Saudi Arabia. The second stage focusses on King Saud University and explores both academic staff and students' views on what the factors that affect student use of e-learning.

We would be grateful if you would accept our invitation to be part of this study through completing this questionnaire. Completing this questionnaire should not take more than 10 minute of your time.

As part of this research project ethical code, anonymity and confidentiality will be respected and protected. No identifying information relating to you will be accessible to any third parties.

This research is being conducted researchers located in the Manchester Metropolitan University, one of whom also has links with King Saud University.

For further information, you can contact us by e-mail at: **abdullah.n.alhabeeb@stu.mmu.ac.uk**

Thank you, in advance, for your help and your support.

Abdullah Alhabeeb

Section A: Factors affecting academic staff use of e-learning

In the following tables, please put a √to indicate your judgement of the importance of the factor in influencing academic staff use of e-learning systems. 1 stands for the “unimportant” while 5 stand for “very important”.

(1= unimportant) (2= of some importance)(3= moderately important)(4 =Important)(5= very important)

Instructor characteristics	1	2	3	4	5
I1. My enthusiasm while teaching using eLearning tools	◯	◯	◯	◯	◯
I2. My ability to motivate the students to use the eLearning systems	◯	◯	◯	◯	◯
I3. The clarity of my explanation of the eLearning components	◯	◯	◯	◯	◯
I4. My ability to use the eLearning system effectively	◯	◯	◯	◯	◯
I5. My style of teaching using eLearning technologies	◯	◯	◯	◯	◯
I6. My friendliness in general and while teaching	◯	◯	◯	◯	◯
I7. My ability to motivate students to get engaged in online discussions	◯	◯	◯	◯	◯
Student characteristics					
S1.Students’ willingness to participate in e-learning	◯	◯	◯	◯	◯
S2. The student’s learning style affecting the use of eLearning	◯	◯	◯	◯	◯
S3. The student’s ability to find things in eLearning system	◯	◯	◯	◯	◯
S4 Student’s experience and knowledge about computers	◯	◯	◯	◯	◯
S5. The level of student’s enjoyment while using technology	◯	◯	◯	◯	◯
S6. The student’s understanding of the purpose of different parts of the eLearning system	◯	◯	◯	◯	◯

Technology Infrastructure	1	2	3	4	5
T1.Easy access to internet					
T2. Browsing is easy					
T3. Availability of online communication tools(e.g.-mail)					
T4. Internet speed					
T5. Availability of multimedia tools/technologies					
T6.Ability to search for learning material using the website					
T7.Availability of sufficient computer labs					
T8. Reliable technical infrastructure					

eLearning systems and Online learning resources	1	2	3	4	5
E1. Ease of registration on e-learning course					
E2. Access to the e-learning resources on and off campus					
E3. The layout and design of information					
E4. Ease of learning material preparation					
E5. Language Support.					
E6. Sufficiency of the learning materials.					
E7. Course interactivity .					
E8. Availability of communications with the instructor in the eLearning system. .					
E9. Availability of online test/quizzes					
E10. Option to return to unfinished tasks.					
E11. Measurement of learning progress .					
E12. Whether the learning material is up-to-date					

Support and training	1	2	3	4	5
ST1. Availability of offline technical support					
ST2. Friendliness of support team					
ST3. Availability of online help desk					

ST4.Availability of training ◯◯◯◯◯

ST5. Availability of on campus printing facilities ◯◯◯◯◯

Section B: Demographic statistics

Thank you for answering our questions about the factors that affect the success of e-learning. Finally, it would be helpful if you were to provide us with some statistics on yourself.

D1	**D1 Age**	☐ Under 25 ☐ 26-40 ☐ 40-55 ☐ Older than 55
D2	**D2 Gender**	☐ Male ☐ Female
D3	**D3 Nationality**	☐ Saudi ☐ Non-Saudi
D4	**D4 Your education level**	☐ Less than bachelor degree ☐ Bachelor degree ☐ Masters degree ☐ PhD
D5	**D5 Your academic Faculty**	
D6	**D6 Your academic department**	
D7	**D7 Your academic position at the university**	☐ Teaching Assistant ☐ Instructor ☐ Lecturer ☐ Assistant Professor ☐ Associate professor ☐ Professor
D8	**D8 Years of teaching experience**	☐ 0-5 ☐ 6-10 ☐ More than 10
D9	**D9 How often do you use the internet (for personal or professional purposes)?**	☐ Never ☐ Everyday ☐ Twice a week ☐ Once a week

		☐ Once a month
D10	**D10 How often do you use the internet for work purposes?**	☐ Never ☐ Everyday ☐ Twice a week ☐ Once a week ☐ Once a month
D11	**D11 How many e-learning workshops have you attended?**	☐ 1-2 ☐ 3-4 ☐ 5-6 ☐ More than 6

Thank you for completing this survey.

Appendix 4: Questionnaire – Academic Staff (Arabic Version)

جــامــعــة
الملك سعود
King Saud University

Manchester
Metropolitan
University

العوامل التي تؤثر في نجاح التعليم الإلكتروني في جامعة الملك سعود

استبيان أعضاء هيئه التدريس

مقدمة

يسرنا ان نعرب لكم عن تقديرنا لمشاركتكم في هذا الاستبيان الذيُ صمم لجمع المعلومات اللازمة للدراسة التي نقوم عليها وهي تحديد العوامل التي تؤثر على استخدام ونجاح التعليم الإلكتروني. لقد تضمنت المرحلة الأولى من الدراسة إجراء مقابلات مع شخصيات رئيسية في ثلاث جامعات في المملكة العربية السعودية . أما في المرحلة الثانية فقد تركزت على جامعة الملك سعود بهدف معرفه أراء الأساتذة والطلاب حول العوامل المؤثرة على استخدام التعليم الإلكتروني.لذا نرجو التكرم بتعبئة فقرات الاستبيان والذي لايستغرق الكثير من الوقت علماً بأن إجابتك ستكون سرية ولن تستخدم إلا في غرض البحث العلمي فقط.

لمزيد من المعلومات ،يمكنكم التواصل معنا عبر البريد الإلكتروني على العنوان التالي:

abdullah.n.alhabeeb@stu.mmu.ac.uk

ولكم جزيل الشكر سلفاً لا هتمامكم وتخصيص جزء من وقتكم الثمين لتعبئة هذا الاستبيان

الباحث/عبدالله ناصر الحبيب

(طالب دكتوراه في قسم إدارة المعلومات).

الباحثة/ البروفيسورة / جيني راولي

أستاذه علم المعلومات

عميده الدراسات العليا ،في كليات العلوم الإنسانية واللغات والعلوم الاجتماعية

العوامل المؤثرة على استخدام أعضاء هيئه التدريس للتعليم الإلكتروني :

القسم الأول:

في الجداول التالية،يرجى وضع علامة √ للإشارةالىأهميةالعواملالمؤثرةعلىاستخدامالطلابلأنظمةالتعلمالإلكتروني

رقم (1) غير مهم، رقم (2) قليل الأهمية، (3) مهم بشكل معتدل، (4) مهم، (5) مهم جداً

<u>خصائص المعلم</u>

حماسي أثناء التدريس لاستخدام أدوات التعليم الإلكتروني	☐	☐	☐	☐	☐
قدرتي على تحفيز الطلاب لاستخدام نظام لتعليم الإلكتروني.	☐	☐	☐	☐	☐
وضوح الشرح الذي أقدمه عن مكونات التعليم الإلكتروني.	☐	☐	☐	☐	☐
قدرتي على استخدام مكونات نظام التعليم الإلكتروني المختلف بشكل فعال .	☐	☐	☐	☐	☐
أسلوبي في التدريس وذلك باستخدام تقنيات التعليم الالكتروني	☐	☐	☐	☐	☐
. .تعزيز العلاقة والارتياح مع الطلاب بشكل عام واثناء التدريس	☐	☐	☐	☐	☐
قدرتي على تحفيز الطلاب على الانخراط في مناقشات عبرا لانترنت	☐	☐	☐	☐	☐

<u>خصائص الطالب</u>

استعداد الطالب للمشاركة في استخدام التعليم الالكتروني.

الطريقة التي يستخدمها الطالب في التعلم (أسلوبه في التعلم).

قدره الطالب على البحث بالطرق المختلفة لنظام لتعليم الالكتروني

مدى خبره و معرفه الطالب بالحاسوب

مستوى الاستمتاع والانسجام لدى الطالب خلال استعمال التقنية

قدره الطالب على فهم واستيعاب الاجزاء المختلفة للنظام لالكتروني

البنية التحتية للتقنية

سهولة الوصول إلى الانترنت.

سهولة التصفح المجاني

توفر وسائل الاتصال عبر الإنترنت

سرعة الانترنت

توفر أدوات الوسائط والتكنولوجيا المتعددة

القدرة على البحث عن المواد التعليمية باستخدام الانترنت

توفر مراكز حاسوب كافية

مستوى الثقة في البنية التحتية للتقنية

أنظمة التعليم الإلكتروني ومصادر التعلم عبر الانترنت

سهولة التسجيل في دورة التعليم الالكتروني

إمكانية الوصول إلى موارد التعليم الالكتروني داخل وخارج الحرم الجامعي

تخطيط وتصميم المعلومات في الموقع الالكتروني

سهولة اعداد المواد التعليمية

الدعم اللغوي

مدى ملائمة او مناسبة المواد التعليمية للدورة التدريبية

التفاعلية أو مستوى التفاعل في الدورة التدريبية

إمكانية التواصل مع المعلم والطالب خلال التعليم الالكتروني

توفر الاختبارات والمسابقات من خلال الانترنت

توفر إمكانية العودة الى المهام التي لم تنجز بعد

القدرة على قياس عملية التعلم عبر اختبارات الكترونية

قيمة المادة العلمية المتاحة لتحسين المستوى الأكاديمي

الدعم والتدريب

توفر الدعم التقني

تكوين العلاقات الودية مع فريق الدعم والتدريب

توفر مكتب المساعدة عبر الإنترنت

توفر التدريب

توفير خدمات الطباعة في الحرم الجامعي

القسم الثاني:

الاسئلةالديموغرافية

العمر	□ أقل من 25 □26-40 □40-55 □55فما فوق
الجنس	□ذكر □أنثى
الجنسية	□سعودي الجنسية □جنسية أخرى
المستوى التعليمي	□أقل من درجه البكالوريوس. □بكالوريوس. □ ماجستير. □ دكتوراه.
المجال التعليمي يتبع لأي كلية	
القسم الأكاديمي(التخصص)	

المنصب الوظيفي في الجامعة	□ مدرس. □ معيد. □ محاضر. □ أستاذ مساعد. □ أستاذ مشارك. □ بروفيسور.
كم عدد سنوات الخبرة في التدريس؟	□ 0 - 5 □6-10. □ أكثر من 10سنوات.
كم عدد سنوات التدريس باستخدام التعليم الالكتروني؟	□ 0-2 □ 3-5 □أكثر من 5
ما معدل استخدامك لشبكة الانترنت (لأغراض شخصية أو مهنية)؟	□أبدا □ كل يوم □ مرتين في الأسبوع □ مرة واحدة في الأسبوع □ مرة واحدة في الشهر
كم عدد مرات استخدام شبكة الانترنت لأغراض التدريس؟	□أبدا □ كل يوم □ مرتين في الأسبوع □ مرة واحدة في الأسبوع □ مرة واحدة في الشهر
كم ورشه عمل حضرت لأجل التعليم الالكتروني؟	□0

	□2-1 □4-3 □6-5 □أكثر من 6

شكراً لكم على استكمال الاستبيان.

Appendix 5: Questionnaire – Students (English Version)

Factors affecting the success of eLearning processes in King Saud University.

Questionnaire for Students

Introduction

We would very much appreciate your participation in our research. We are seeking to identify the factors that affect the use and success of e-learning. The first phase of our study involved interviews with key informants in three universities in Saudi Arabia. The second stage focusses on King Saud University and explores both academic staff and students' views on what the factors that affect student use of e-learning.

We would be grateful if you would accept our invitation to be part of this study through completing this questionnaire. Completing this questionnaire should not take more than 10 minute of your time.

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For further information, you can contact us by e-mail at**: abdullah.n.alhabeeb@stu.mmu.ac.uk**

Thank you, in advance, for your help and your support.

Abdullah Alhabeeb

Section A: Factors affecting student use of e-learning

In the following tables, please put a √to indicate your judgement of the importance of the factor in influencing students' use of e-learning systems. 1 stands for the "unimportant" while 5 stand for "very important".

(1= unimportant) (2= of some importance)(3= moderately important)(4 =Important)(5= very important)

<u>Instructor characteristics</u>

	1	2	3	4	5
I1. Instructor's enthusiasm while teaching using eLearning tools	○	○	○	○	○
I2. Instructor's ability to motivate the students to use the eLearning system	○	○	○	○	○
I3. The clarity of instructor's explanation of the eLearning components	○	○	○	○	○
I4.Instructor's ability to use the eLearning system effectively.	○	○	○	○	○
I5. Instructor's style of teaching using eLearning technologies	○	○	○	○	○
I6. Instructor's friendliness in general and while teaching	○	○	○	○	○
I7. Instructor's ability to motivate students to get engaged in online discussions	○	○	○	○	○

<u>Student characteristics</u>

S1.Students' willingness to participate in e-learning	○	○	○	○	○
S2. The student's learning style affecting the use of eLearning	○	○	○	○	○
S3. The student's ability to find things in eLearning system.	○	○	○	○	○
S4 Student's experience and knowledge about computers	○	○	○	○	○
S5. The level of student's enjoyment while using technology	○	○	○	○	○
S6. The student's understanding of the purpose of different parts of the eLearning system	○	○	○	○	○

Technology Infrastructure

	1	2	3	4	5
T1.Easy access to internet	○	○	○	○	○
T2. Browsing is easy	○	○	○	○	○
T3. Availability of online communication tools(e.g.-mail)	○	○	○	○	○
T4. Internet speed	○	○	○	○	○
T5. Availability of multimedia tools/technologies	○	○	○	○	○
T6.Ability to search for learning material using the website	○	○	○	○	○
T7.Availability of sufficient computer labs	○	○	○	○	○
T8. Reliable technical infrastructure	○	○	○	○	○

eLearning systems and Online learning resources

	1	2	3	4	5
E1. Ease of registration on e-learning course.	○	○	○	○	○
E2. Access to the e-learning resources on and off campus	○	○	○	○	○
E3. The layout and design of information.	○	○	○	○	○
E4. Language Support.	○	○	○	○	○
E5. Sufficiency of the learning materials.	○	○	○	○	○
E6. Course interactivity.	○	○	○	○	○
E7. Availability of communications with the instructor in the eLearning system.	○	○	○	○	○
E8. Availability of online test/quizzes.	○	○	○	○	○
E9. Option to return to unfinished tasks.	○	○	○	○	○
E10. Measurement of learning progress.	○	○	○	○	○
E11. Whether the learning material is up-to-date.	○	○	○	○	○

Support and training

	1	2	3	4	5
ST1. Availability of offline technical support	○	○	○	○	○
ST2. Friendliness of support team	○	○	○	○	○
ST3. Availability of online help desk	○	○	○	○	○
ST4.Availability of training	○	○	○	○	○
ST5. Availability of on campus printing facilities.	○	○	○	○	○

Section (B): Demographics questions

D1	D1 Age	☐ Under 20 ☐ 21-25 ☐ 26 -30 ☐ Older than 31
D2	D2 Gender	☐ Male ☐ Female
D3	D3 Nationality	☐ Saudi ☐ Non-Saudi
D4	D4 Your field of study	
D5	D5 Your academic department	
D6	D6 Your year of study	☐ 0-1 ☐ 2-3 ☐ 3-4 ☐ More than 5
D7	D7 Are you postgraduate or undergraduate student?	☐ Postgraduate. ☐ Undergraduate.
D8	D8 Years of eLearning based learning	☐ 0-2 ☐ 3-5 ☐ More than 5
D9	D9 How often do you use the internet (for personal or professional purposes)?	☐ Everyday ☐ Twice a week ☐ Once a week ☐ Once a month
D10	D10 How often do you use the internet for study purposes?	☐ Everyday ☐ Twice a week ☐ Once a week ☐ Once a month
D11	D11 If you use the internet, how long does it last?	☐ 30-60 minutes ☐ 1-2 hours ☐ 3-5 hours ☐ More than 5 hours

Thank you for completing this survey.

Appendix 6: Questionnaire – Students (Arabic Version)

العوامل التي تؤثر في نجاح التعليم الإلكتروني في جامعة الملك سعود

استبيان الطلاب

مقدمة

يسرنا ان نعرب لكم عن تقديرنا لمشاركتكم في هذا الاستبيان الذئ صمم لجمع المعلومات اللازمة للدراسة التي نقوم عليها وهي تحديد العوامل التي تؤثر على استخدام ونجاح التعليم الإلكتروني. لقد تضمنت المرحلة الأولى من الدراسة إجراء مقابلات مع شخصيات رئيسية في ثلاث جامعات في المملكة العربية السعودية . أما في المرحلة الثانية فقد تركزت على جامعة الملك سعود بهدف معرفه أراء الأساتذة والطلاب حول العوامل المؤثرة على استخدام التعليم الإلكتروني.لذا نرجو التكرم بتعبئة فقرات الاستبيان والذي لايستغرق الكثير من الوقت علماً بأن إجابتك ستكون سرية ولن تستخدم إلا في غرض البحث العلمي فقط.

لمزيد من المعلومات ،يمكنكم التواصل معنا عبر البريد الإلكتروني على العنوان التالي:

abdullah.n.alhabeeb@stu.mmu.ac.uk

ولكم جزيل الشكر سلفاً لا هتمامكم وتخصيص جزء من وقتكم الثمين لتعبئة هذا الاستبيان

الباحث/عبدالله ناصر الحبيب

(طالب دكتوراه في قسم إدارة المعلومات).

الباحثة/ البروفيسورة / جيني راولي

أستاذه علم المعلومات

عميده الدراسات العليا ،في كليات العلوم الإنسانية واللغات والعلوم الاجتماعية

العوامل المؤثرة على استخدام الطلاب للتعليم الإلكتروني :

القسم الأول:

في الجداول التالية،يرجى وضع علامة **√** للإشارةالىأهميةالعواملالمؤثرةعلىاستخدامالطلابلأنظمةالتعلمالإلكتروني

رقم (1) غير مهم، رقم (2) قليل الأهمية، (3) مهم بشكل معتدل، (4) مهم، (5) مهم جداً

<u>خصائص المعلم</u>

حماس المعلم أثناء التدريس لاستخدام أدوات التعليم الإلكتروني ☐ ☐ ☐ ☐ ☐

قدره المعلم على تحفيز الطلاب لاستخدام نظام لتعليم الإلكتروني. ☐ ☐ ☐ ☐ ☐

وضوح شرح المعلم عن مكونات التعليم الإلكتروني. ☐ ☐ ☐ ☐ ☐

قدره المعلم على استخدام مكونات نظام التعليم الإلكتروني المختلف بشكل فعال . ☐ ☐ ☐ ☐ ☐

أسلوب المعلم في التدريس وذلك باستخدام تقنيات التعليم الالكتروني ☐ ☐ ☐ ☐ ☐

. تعزيز العلاقة والارتياح مع الطلاب بشكل عام واثناء التدريس ☐ ☐ ☐ ☐ ☐

قدره المعلم على تحفيز الطلاب على الانخراط في مناقشات عبرا لانترنت ☐ ☐ ☐ ☐ ☐

<u>خصائص الطالب</u>

استعدادي الطالب للمشاركة في استخدام التعليم الالكتروني. ☐ ☐ ☐ ☐ ☐

الطريقة التي استخدمها في التعلم (أسلوبه في التعلم). ☐ ☐ ☐ ☐ ☐

قدرتي على البحث بالطرق المختلفة لنظام لتعليم الالكتروني

مدى خبره و معرفه الطالب بالحاسوب

مستوى الاستمتاع والانسجام لدى الطالب خلال استعمال التقنية

قدرتي على فهم واستيعاب الاجزاء المختلفة للنظام لالكتروني

<u>البنية التحتية للتقنية</u>

سهولة الوصول إلى الانترنت.

سهولة التصفح المجاني

توفر وسائل الاتصال عبر الإنترنت

سرعة الانترنت

توفر أدوات الوسائط والتكنولوجيا المتعددة

القدرة على البحث عن المواد التعليمية باستخدام الانترنت

توفر مراكز حاسوب كافية

مستوى الثقة في البنية التحتية للتقنية

<u>أنظمة التعليم الإلكترونى ومصادر التعلم عبر الانترنت</u>

سهولة التسجيل في دورة التعليم الالكتروني

إمكانية الوصول إلى موارد التعليم الالكتروني داخل وخارج الحرم الجامعي

تخطيط وتصميم المعلومات على الموقع الالكتروني

الدعم اللغوي

مدى ملائمة او مناسبة المواد التعليمية للدورة التدريبية

مستوى التفاعل في الدورة التدريبية			☐	☐	☐
إمكانية التواصل مع المعلم والطالب من خلال التعليم الالكتروني	☐	☐	☐	☐	☐
توفر الاختبارات والمسابقات التعليمية الالكترونية	☐	☐	☐	☐	☐
توفر امكانية العودة الى المهام التي لم تنجز	☐	☐	☐	☐	☐
القدرة على قياس عملية التعلم عبر اختبارات الكترونية	☐	☐	☐	☐	☐
قيمة المادة التعليمية المتاحة لتحسين المستوى الأكاديمي	☐	☐	☐	☐	☐

الدعم والتدريب

توفر الدعم التقني	☐	☐	☐	☐	☐
تكوين العلاقات الودية مع فريق الدعم والتدريب	☐	☐	☐	☐	☐
توفر مكتب المساعدة عبر الإنترنت	☐	☐	☐	☐	☐
توفر التدريب	☐	☐	☐	☐	☐
توفير خدمات الطباعة في الحرم الجامعي	☐	☐	☐	☐	☐

القسم الثاني:

الاسئلة الديموغرافية

العمر	□ أقل من 20 □ 21-25 □ 26-30 □31 فما فوق
الجنس	□ ذكر □ أنثى
الجنسية	□ سعودي الجنسية □ جنسية أخرى
مجال الدراسة "لأي كلية تتبع دراستك"	
القسم الأكاديمي (التخصص)	
السنة الدراسية (بأي سنه دراسية تدرس حالياً)	□0-1 □ 2-3 □ 3-4 □أكثرمن 5 سنوات
في أي مرحلة دراسية تدرس؟	
ما عدد سنوات استخدامك للتعليم الالكتروني؟	□ 0-2 □ 3-5 □أكثر من 5

ما معدل استخدامك لشبكة الانترنت (لأغراض شخصية)	□أبدا □ كل يوم □ مرتين في الأسبوع □ مرة واحدة في الأسبوع □ مرة واحدة في الشهر
عدد مرات استخدام شبكة الانترنت لأغراض الدراسة	□أبدا □ كل يوم □ مرتين في الأسبوع □ مرة واحدة في الأسبوع □ مرة واحدة في الشهر
كم من الوقت تقضي في حالة استخدامك للانترنت؟	□ 30 - 60 دقيقة □ 1-2 ساعات □3-5 ساعات □ أكثر من 5 ساعات
هل سبق لك ان قمت باستخدام برنامج التعليم الالكتروني؟	□نعم □لا

شكراً لكم على استكمال الاستبيان.

Appendix 7: Correspondences – (English Version)

Kingdom of Saudi Arabia
The Arabization Office For Certified Translation
License No.: 392
Chamber of Commerce No.: 23527

المملكة العربية السعودية
مكتب التعريب للترجمة المعتمدة
ترخيص رقم : ٣٩٢
عضوية الغرفة التجارية : ٢٣٥٢٧

Kingdom of Saudi Arabia
King Saud University
College of Arts
P.O. Box No. 2456 Riyadh 1145

AFFIDAVIT

Name : ABDULLAH NASSER ALHABEEB
University : Manchester Metropolitan University
Degree : Doctorate
University No.: 13500534

To Whom It May Concern

Peace & Mercy of Allah be upon you all,,,

We would like to inform you that the above mentioned has fulfilled the requirements of the scientific degree related to the Doctorate Research under the title of: "The Factors Affecting the Success of E-Learning Processes in King Saud University" through collecting the data related to his scientific research from the students and Academic Staff at the University within (59) days.

Thanks & Best Regards,,,

Chief Information Officer
Prof. Mansour Ali Al-Shari (s/d)
Officially signed & stamped

Office Stamp

Arabization Office for Certified Translation
Service Type
Serial No 1028
Date 2016/09/20 1437/12/18هـ
Translator 1
No.of O.P 1
Price 50.00
Signature

القصيم - بريدة - طريق الملك عبدالعزيز - (الخبيب سابقا) هاتف : ٠١٦ ٣٢٤٢٤٤٩ فاكس : ٠١٦ ٣٢٤٢٤٤٩
AL-Qassim - Buraidah - King Abdul Aziz Road (Khobaib) Tel.: 016 3242449 - Fax .: 016 3242449

Appendix 8: Correspondences – (Arabic Version)

جامعة الملك سعود
King Saud University

المملكة العربية السعودية
ص.ب 2456 الرياض 11451
www.ksu.edu.sa

جامعة الملك سعو
هاتف 65 54 467 11
فاكس 81 36 467 11 6

كلية الآداب

إفادة

الاسم/ عبدالله ناصر الحبيب

الجامعة/ جامعة مانشستر متروبولتان

المرحلة / الدكتوراه

الرقم الجامعي/ ١٣٥٠٠٥٣٤

إلى من يهمه الأمر/

السلام عليكم ورحمة الله وبركاته،،وبعد.

نود إفادتكم بأن المذكور أعلاه قد أنهى ،تطلبات الرحلة العلمية المتعلقة بموضوع بحث الدكتوراه تحت عنوان "العوامل المؤثرة على نجاح التعليم الإلكتروني بجامعة الملك سعود" وذلك من خلال جمع البيانات ذات الصلة بموضوع بحثه العلمي من الطلاب والأستاذة بالجامعة وذلك بمدة(٥٩) يوم.

ولسعادتكم فائق الاحترام والتقدير،،،،

رئيس قسم علم المعلومات

أ.د. منصور بن علي الشهري

جامعة الملك سعود
كلية الآداب
قسم علم المعلومات
King Saud University
DEPT. Information Science

٣/١/٤٤١٧٣٦
٩١٤٣٧/١٢/٣