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A Hybrid Quality Model for eLearning

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A Hybrid Quality Model for eLearning

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DEDICATION

To my parents and my dear wife Abeer. Also, to my children Anas, Hiba, Ahmmad, and Ayman for growing up to great adults by the end of this thesis.

Signature:…….

Mohammed Zaki Ahmmad Harasheh

Date:……

DECLARATION

I certify that this thesis submitted for the degree of master, is the result of my own research, except where otherwise acknowledged, and that this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed: …….

Mohammed Zaki Ahmmad Harasheh

Date: …….

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ABSTRACT

Many higher education institutions are implementing eLearning for improving the quality of learning. However, these implementations have been characterized by a lack of quality of the provided learning environment. It is within this background, this study was motivated to manage and enhance eLearning quality in higher education institutions. The overall objective of this thesis study is to improve the quality of eLearning in Palestinian Higher Education Institutions through proposing a quality model for the design, development and implementation of eLearning.

This research study used a mixed research methodology to achieve the intended goals and objectives. A critical literature review was conducted that explores the characteristics of quality, quality models in the field of learning, education, and teaching. Data is collected in both a quantitative and a qualitative way. A research instrument was designed as a data collection method to gather information about research questions. Data analysis was done using descriptive and inference statistics.

The first step of this study was a critical literature review to identify and analyze the state-of-the-art of the concepts of quality in general and quality in eLearning in particular. A review of quality and eLearning showed that quality in eLearning has different meaning and should be seen from different perspectives and levels. A comparison of software quality models was conducted and resulted in identifying that quality models are following the hierarchal approach and the most important quality factors that can be used in eLearning. These factors are: reliability, efficiency, functionality, and reusability. Reviewing general quality management approaches such as ISO 9000, EFQM and MBNQA, showed that a concern of the three models is a focus on student and customer satisfaction with a concentration on people, leadership, and quality should be seen as a continuous improvement and deployment of processes. Moreover, a set of critical success factors were synthesized from a thorough literature review and adding current and future challenges identified in literature. This list of CSF provides a comprehensive list of factors that needs to be considered for a successful eLearning.

To achieve the main objective of this study, “A Hybrid eLearning Quality Model” (eLQM) was proposed. eLQM is a holistic hybrid quality model for the design and development processes of eLearning that integrates characteristics of different fields. eLQM combines software quality models methodology, quality management approaches and characteristics are combined with instructional design strategies based learning theories, process oriented and product oriented. The model contains 97 criteria grouped into 49 sub-factors, and these 49 sub-factors are grouped into ten main factors. These factors include: Institutional Factor, Pedagogical Factor, Technological Factors, Student Support, Instructor factors, Support Factors, Cultural Factors, Content Factors, Instructional Design Factor, and Delivery Factor.

A research instrument was constructed and executed to validate the proposed “hybrid quality model for eLearning”. Data analysis of the research instrument shows that providing quality eLearning needs a consideration of a set of critical success factor. Principal components analysis was preformed on the 10 quality factors. The analysis resulted in identifying the significance and contributions for the ten factors to quality eLearning. Instructional design factor was found to be the most significant and had the highest contribution 12% between all factors. Hence any improvement in this factor will result in an improvement in managing and enhancing eLearning quality with at least 12% followed by content and culture with the same contribution. The least significant quality factor found was the pedagogical and contributes to quality improvement with 9%. Another finding, future of learning and teaching is eLearning in PHEIs is eLearning as 95% of respondents said that they will use eLearning to support their learning teaching in future. These findings have implication on the way eLearning quality is managed and enhanced in higher education institutions.

An analysis to assess and evaluate currents status of quality eLearning in Palestinian higher education institutions was conducted based on eLQM critical success factor and data from research instrument. Results showed that quality in eLearning is still in its initial state and many efforts still needed to improve its quality and successful.

The outcome of the study is useful for the management and eLearning developers to continuously improve the service quality of learning, education and training. The results of the improvement effort finally will benefit the students as well. In the long run, this study is a part of periodically and continuously evaluations and reviews series. Furthermore, academia can use the findings of this study as a basis to initiate other related studies in the eLearning area.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
BZU	Birzeit University
CEN /ISSS	European Committee for Standardization (Comit´e Europ´een de Normalisation)
CSF	Critical Success Factor
DDLM	Demand Driven Learning Model
EFQM	European Framework Quality Management
ELQ	E-Learning Quality model by The Swedish National Agency for Higher Education
eLQM	A hybrid Quality Model for eLearning
FAQ	Frequently Asked Questions
HE	Higher Education
HE	Higher Education
HEI	Higher Education Institution
Högskoleverket	The Swedish National Agency for Higher Education
ICT	Information & Communication Technology
ID	Instructional Design
IEEE	International Electrical and Electronic Engineering
IHEP	The Institute for Higher Education Policy
IPO	Input-process-Output
ISO	International Standardization Organization
ISO/IEC	International Standardization Organization and International Electro technical Commission Committee
LCMS	Learning Content Management Systems
LET	Learning, Education, and Training
LMS	Learning Management Systems
LTSC	Learning Technologies Standardization Committee from IEEE
MBNQA	Malcolm Baldrige National Quality Assurance
NNU	An-Najah National University
PCA	Principal Components Analysis
PHEIs	Palestinian Higher Education Institutions
PTU	Palestine Technical University (Khodori)
QA	Quality Assurance
QOU	Al-Quds Open University
SLOAN-C	Sloan Consortium. A Consortium of Institutions and Organizations Committed to Quality Online Education
TQM	Total Quality Management
UK	United Kingdom

LIST OF APPENDICES

CHAPTER ONE

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1 INTRODUCTION

1.1 Introduction

The purpose of chapter one is to present holistic information about the whole work. This chapter describes the bases of the thesis and provides an overview of what the thesis aims to study. A description of the problem statement, the objectives and the scope of the study, as well as the importance of the study and the outline of the thesis, are all covered in this chapter.

1.2 Problem Statement

Quality in the field of eLearning in higher education is an issue of increasing importance (Husson, 2004b; Hildebrandt & Teschler, 2004a; Ehlers, 2007). Although the quality of eLearning is not a well defined metric (Nichols, 2002), a variety of quality approaches with different scopes and objectives had been developed. The design, development and implementation of these approaches however often lack success; the decision for an appropriate approach is difficult (Ehlers & Pawlowski, 2004).

The integration of Information Communication Technology (ICT) in the teaching and learning had transformed the traditional learning face-to-face to eLearning. Accordingly, many universities are implementing eLearning in their institutions to enhance the flexibility of teaching and learning. In order to support eLearning, a large number of eLearning initiatives and systems are now available such as Web Course Tools (WebCT), Blackboard Learning System, etc. But, eLearning experiences were disappointed and cause many projects to fail such as UK eUniversity, NYU Online, Scottish Knowledge, Universitas 21 and Global University Alliance (Oliver, 2005). The fail was due to not providing effective and efficient quality eLearning. One of the major barriers to successful deployment of eLearning is the lack of high quality in eLearning (Lanzilotti et al, 2006).

The different meaning and perspectives of quality in general and higher education in particular makes it difficult to implement quality in higher education and eLearning. Harvey and Green (1993) define quality in eLearning as: exception, perfection, fitness for purpose, value for money, and transformation. Furthermore, Chua (2004) interpreted the quality for higher education in terms of the Input-Process-Output (IPO) framework. Ehlers

(2004), investigated quality in eLearning from three different dimensions: Different meanings of quality, Different quality perspectives; and Different levels of the educational process. Quality in the field of eLearning should consider all the factors that influence the successful implementation and should be seen from different view and perspectives.

The complicated nature of the educational product (Brookes & Becket (2007), the different meanings of quality for different stakeholders (Ehelers, 2004) and the complexity of educational field (Hildebrandt & Teschler, 2004a) made it more difficult to manage quality in higher education. Learning and education is always bound to the context in which it takes place. To manage and enhance learning in higher education institutions, different quality approaches exist.

The need for quality frameworks in eLearning in higher education (HE) has gained a great importance due to the growing demand for quality (Ehlers, 2007). While higher education institutions were trying to improve quality they use existing quality management approaches models originally developed for industry, Total Quality Management (TQM) approaches, or quality management approached developed specifically for higher education.

The influence of quality in the production field and its expansion to services forces led to the establishment of national and international institutions to mange and enhance quality. The main purpose of quality is to reduce cost and provide customer satisfaction. Despite these facts quality is a vague and abstract term that is understand differently by different people. Quality models such as Malcolm Baldrige National Quality Award (MBNQA), European Framework for Quality Management Excellence Model (EFQM), ISO 9000 are used as frameworks for implementing Total quality Management (TQM) to assess, enhance and improve quality of products and services. The effectiveness of such models in HE is questionable due to the nature of learning and teaching (Brookes & Becket, 2006).

The effective implementation of eLearning requires the consideration of critical success factors (CSFs) in development and evaluation of eLearning. Different sets of CSFs put forward by different users from different views and perspectives. Some of these are from students perspectives (Volery & Lord, 2000; Alexander, 2001), others from technology acceptance model (Selim, 2007; Sun et al., 2008), while others from pedagogical view point (Frydenberg, 2002; Govindasamy, 2002).

The literature provides several quality approaches to manage quality in the field of eLearning. These quality approaches are approaching eLearning quality from a process-oriented (such as QA model for eLearning by Abdous (2009) or product-oriented point (Quality on the Line by IHEP (2000) of view and trying to enhance the effectiveness and efficiency of eLearning. Other studies looked at the target group (learners, developers, managers / administrators, teacher / tutor, or contents) such as the Model of subjective quality by Ehlers (2004). Yet, other studies try to develop their own criteria, which can be used only at national, regional or local level (Wirth, 2005). One of these is eLearning success model developed by Holsaple and Lee-Post (2006). This model defines the learning success based on IT&C through a three-step evaluation: system design, system delivery and system results.

Another research in developing and enhancing quality of eLearning is based on the Information system perspectives by using the Technology Acceptance Model (TAM) and its extension. This research based on the TAM provides useful elements that should be taken into account for the development of eLearning evaluation methods; however it does not necessarily reflect the magnitude of the value created by e-learning, since there are occasions.

Currently available frameworks provide general guidelines for creating programs of high quality, but they are not specific enough to be of high value in comprehensively organizing and ensuring a quality online degree program. Hence, the development of a solid and comprehensive framework for benchmarking quality of online degree programs is critical to future program growth and expansion (Mariasingam & Hanna, 2006).

Despite these improvements, there is no general framework for quality management, quality assurance, or quality assessment in the field of E-Learning (Pawlowsli, 2003b). Suzuki (2009) added managing quality in higher education is still a debate. Therefore, further research is required for the design, development, and implementation of quality in eLearning. In order to improve the quality of e-Learning, a cohesive framework is needed to be generated that can be used to serve for various aspects of e-Learning development.

Based on the above discussions and arguments, a holistic hybrid quality model for eLearning should be developed to assure, enhance the process of designing, developing and implementations of eLearning. The quality of eLearning should be viewed from a wide perspective that integrates the factors that influence quality of eLearning system from Information System, Education, and project management point of view, taking into account the view point of all stakeholders. With the purpose to support the continuous improvement of quality e-learning, the "A hybrid eLearning Quality Model" eLQM quality framework was developed to promote and encourage the e-learning to provide high quality e-learning.

1.3 Objectives of the Study

The main objective of this thesis is to improve the quality of eLearning in Palestinian Higher Education Institutions (PHEIs) through proposing a quality model for the design, development and implementation of eLearning based on a hybrid approach. Software quality models methodology, quality management approaches and characteristics are combined with instructional design strategies based on learning theories to produce the eLQM. Having constructed the model, we expect to highlight the major quality elements that contribute to the overall quality of the eLearning.

The overall objectives of this thesis include:

- To provide a set of critical success factors that could enhance eLearning.
- To propose a quality model in eLearning implementation in the HE.
- To develop a set of recommendations to assure eLearning quality.

The specific objectives of this thesis include:

- Enabling better understanding of quality aspects in eLearning.
- Examining features that could promote success in eLearning.
- Studying eLearning stakeholders' profile in PHEIs.
- Identifying significance and contribution of each quality factor.
- Developing a set of quality guidelines for eLearning.

To achieve these objectives:

- A literature review to identify and analyze the state-of-the-art of the concepts of quality in general and quality in eLearning in particular.
- A literature review of critical success factors in the field of eLearning
- A Literature review of quality management approaches in business, software, and eLearning
- Development of a proposed model for building quality eLearning material based on the analysis of literature and the survey
- A survey of current trend and issues of eLearning and quality of eLearning in Palestinian Higher Education Institutions (PHEIs) will be done.
- Validation of the proposed eLQM based on the results of questionnaire.
- Conducting factor analysis to identify contribution of each quality factor.

1.4 Hypothesis of the Study

The world is moving into a knowledge base society and a quality eLearning is one of its features in these days. How can we manage and enhance and produce a quality eLearning is one of its challenges in these days.

Because the aim of the study is to propose a quality framework that is based on the existing theories found in the literature, it is difficult to formulate a hypothesis because the research is based on discovering the knowledge in the specified field. But to state a hypothesis, the lack of general quality framework for quality management, quality assurance, and /or quality assessment in the field of eLearning, the debate on how to manage quality in eLearning that satisfy the needs and requirements of all stakeholders in the field of eLearning, the increasing importance of quality in eLearning were the main motivations for this thesis.

A critical set of success factors will be synthesized from the literature taking into account current and future challenges. A hybrid eLearning quality model will be proposed to manage eLearning quality. A research instrument will be constructed and administered to validate the proposed quality model, to see if these factors could be recognized by respondents, and to determine factor significance for quality improvement. Provide a set of recommendation for building successful and quality eLearning based on literature and survey results.

1.5 Problem Questions

Based on the above discussions, the thesis will try to answer the following main questions:

- What are the critical success factors for eLearning in higher education institutions?
- How to manage and enhance quality of eLearning in higher education?
- What are the recommendations in implementing quality in eLearning?

Particularly, the thesis analyzed the following questions to be able to answer the main research question:

- What is eLearning
- What is the meaning of quality in eLearning and related fields?
- What are the quality approaches for implementing quality eLearning?
- What is the appropriate strategy to improve the quality of your eLearning courses?
- What are the recommendations in implementing quality in eLearning?

1.6 Scope of the Study

As this thesis is limited by its size and duration, we have constrained the size of the thesis. So, we have intended to focus our research study on the quality management, quality assurance of learning, education, training in the field of eLearning in the traditional universities and community colleges in the Palestinian Educational System, including the Open University and the private sector experience in the field of eLearning. We have not made any studies, recommendations, suggestions for general school, general secondary schools, and vocational schools. Furthermore, the proposed model has only taken into account the design, development and implementation of eLearning.

1.7 Expected Contributions

The expected contributions of this study may be outlined as follow:

- Better understanding of quality different meaning related to eLearning
- Identifying the most important quality factors found in general quality management systems
- Identifying characteristics of software quality model that may be used while developing a hybrid quality model for eLearning
- Synthesizing a set of critical success factors that is necessary to produces a successful eLearning
- Identifying how eLearning quality frameworks / approaches may be developed
- Identifying eLearning status in Palestinian Higher Education Institution
- Proposing a quality model for managing quality in eLearning
- Identifying significance and contribution of each factor in the model.

These expected contributions will be explored and discussed during different parts in this thesis body.

1.8 Importance of the Study

The outcome of the study is useful for the management and staff of the faculty to continuously improve the service quality of eLearning. The results of the improvement effort finally will have a positive impact on the students as well.

For Higher Education Institutions (HEI) this model will be of great importance. It will enhance the HEI reputation and place them in a competitive market in the field of attracting more learners.

The results presented in this thesis can certainly help institutions adopt eLearning technology by overcoming potential obstacles, and hence reduce the risk of failure during implementation. Furthermore, academia can use the findings of this study as a basis to initiate other related studies in the eLearning area.

1.9 Thesis Structure

Chapter one, this chapter, introduces the background of the research area which is about building a quality model for the eLearning, the statement, the objectives of the study, the scope of the study and the importance of the study.

Chapter two addresses the existing literature on eLearning, quality, quality of higher education, quality in eLearning. Software quality models will be introduced and compared from eLearning point of view .Also, critical success factors in eLearning, quality models in software projects, international quality management approaches, and quality models in eLearning, developing a quality model in eLearning have been reviewed.

Chapter three presents the proposed quality model. In this chapter an introduction of each quality factor in the proposed model is introduced. Also, for each quality factor its criteria and their importance and how to manage and enhance the eLearning is argued and analyzed.

Chapter four outlines the methodology and research design that was used to accomplish thesis mission. Also, how data is gathered and the strategy used to perform and analyze the data is explained. It also addresses issues regarding the validity methods used in validating the gathered data.

Chapter five presents and discusses in detail the method used to gather data based on the research instrument, how the research instrument was conducted at different HEI, along with the findings from the survey. In addition, chapter five discusses the finding of the

proposed model in order to validate and enhance it in terms of these findings. Also, necessary comments on these finding related to thesis objectives.

Chapter six summarizes the main findings according to the research questions. Then, a discussion of these findings with respect to other research and studies is presented.

Lastly, the final chapter summarizes the major finding of this thesis research, discuses their limitations and provides recommendation and future work of the thesis.

CHAPTER TWO

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2 LITERATURE SURVEY

This chapter presents the theory and concepts related to quality of eLearning. It reviews relevant literatures on eLearning, quality concepts in various fields such as quality in general, quality in software, quality in higher education and quality in eLearning. Next, a discussion about software quality models will be introduced. This will be followed by discussion about quality management approaches in higher education. After this, critical success factors for eLearning will be discussed. Furthermore, an overview of eLearning quality mode is presented. This review will help us to move forward, compare findings and identify our contributions.

This chapter starts with section 2.1, which introduces higher education and eLearning in Palestine. Section 2.2, which introduces the concept of eLearning and how it has been variously defined, its advantages and disadvantages. Section 2.3, presents and discusses the existing literature on the concept of quality. Section 2.4, introduces and discusses software quality models. While section 2.5, introduces quality management approaches, section 2.6 presents, compares, and synthesis of eLearning critical success factors. Section 2.7; introduces the various eLearning quality model to enhance eLearning quality. The last section (2.8) concludes the chapter.

2.1 Higher Education and eLearning in Palestine

The Palestinian education system consists of the following: 1) General schools which includes the pre-elementary schools (nursery schools) and basic schools from class one to class ten, 2) General Secondary schools which includes classes from eleven, Tawjihi and vocational schools, 3) Higher education Institutions that include Community Colleges and technical and vocational training schools and Universities that offer under graduate and postgraduate programs.

Ministry of Education and Higher Education (MOEHE), after Oslo agreement in 1993, started to reform the inherited education system from occupation in general and higher education in particular. MOEHE has been working very hard to build an education system responsive to developmental needs of Palestinian people. Since that time, the MOEHE and universities are cooperating to develop and improve the higher educations (HE).

The higher education in Palestine plays vital role in developing the social, political and economical situation of the Palestinian People where it is considered as the main wealth of the Palestinian people in the absence of the other natural resources.

The development of the higher education in Palestine became basic element and essential requirement in the current situation and the, so the counting on the academic human resources became basic and vital element in building an independent Palestinian state, higher education is one of the main elements of building its infra structure. Distance education has become mandatory in Palestine because of problem of traveling to the education centers, limited sources, scarcity of experienced, closer or road by occupation and many others.

These issues resulted in increasing number of HEI to 49 in the year 2009/2010 (MOHHE , 2010). In the West Bank and Gaza there are 13 traditional universities, one Open University, 15 university colleges, and 20 community colleges. Most of these were established during the Israel occupation and are non-profit institutions. The single Open University is the Al-Quds Open University.

During this development most Palestinian higher education institutions established eLearning initiatives and introducing eLearning into their offered courses to enhance the traditional educational with eLearning technologies. These universities include: Al-Quds Open University, BirZeit University, Al-Najah University, BethLehem University, Al-Quds University, Palestine Polytechnic University and other Palestinian universities. These initiatives are offering blended learning mode courses in addition to some limited number of fully on-line courses. These initiatives include:

- Birzeit University (BZU) has started the Ritaj portal, which provides on line information on the administrative and material services to the students. BZU uses eLearning solution to support its courses by using the open source platform (MOODLE), which offered some eCourses.
- Islamic University of Gaza has also started an eLearning center, which offers on line teaching content to the students. A Web Course Tools (WebCT) has been used as a course management system to support and facilitate using information technology and modern communication in the educational process.
- Al-Quds University (QU) eLearning activities supervised by Said Khoury IT Center of Excellence, it uses the eLearning solution to facilitate course delivery through Web technology, uses the open source platform (MOODLE) to offer some of its courses.
- Palestine Polytechnic University has an eLearning Unit for managing eLearning activities; it uses eLearning solution to support its courses by using a customized version of the open source platform (MOODLE).
- An-Najah National University (NNU) started eLearning activities supervised by eLearning Committee (from Computer center, Computer Engineering Department, IT College), it uses a local platform (On-line Course Container and Digital Contents) to provide shell for the learning content and to facilitate student and instructor communications.
- Bethlehem University (BU) using the open source platform (MOODLE) to offer some of its courses as supported courses.

- Al-Quds Open University (QOU) has two related projects; Avicenna virtual Campus project, which aim to produce online courses. It has also Academic Portal which allows students and tutors to communicate and exchange materials.

Despite these initiatives and other in other universities eLearning in Palestine is facing many problems. These eLearning initiatives face major challenges that could threaten their existence. These threats includes: poor accessibility, poor infrastructure because of lack of money and support from government, expensive of existing telecommunication systems and limitation forced by occupation on this system, quality and many others.

Several initiatives were accomplished to address the quality of eLearning systems. These include a 5-local university and 5-European ones formed a consortium in an EU tempus-supported project. Furthermore, an International conference known as The 3nd Palestinian International Conference on Computer and Information Technology (PICCIT 2010) was organized by the Palestine Polytechnique University. These trivial initiatives demonstrate the importance of quality of eLearning within the local universities.

2.2 ELearning

2.2.1 ELearning Definition

The term eLearning has been defined numerously by different researchers and authors (Mahmud, 2010; Wanger, Hassanein, & Head, 2008); even more the word has been written in many different ways (Romiszowski, 2004): *-eLearning, eLearning, E-Learning, and ELearning*. Moreover, the term eLearning have been used interchangeably with other terms (Farrell, 2001; Sharifabadi, 2006) such as: *online learning, online education, technology-based learning/training, web-based learning/training, computer-based training* (generally thought of as learning from a CD-ROM), *Open Learning, Networked Learning, Virtual Learning*, which makes it difficult to develop a generic definition. The eLearning terminology will be adopted throughout this thesis.

Various authors on this topic have provided many definitions on eLearning. ELearning is defined as instructional content or learning experiences delivered or enabled by electronic technology (Ong, Lai & Wang, 2004; Aydin & Tasci, 2005). This definition implies that eLearning is a subset of distance learning.

According to Alonso et al (2005), eLearning is defined as the use of technologies in learning opportunities. In other words, eLearning involves a skill for using electronic technologies such as computer and Internet based courseware and local and wide area networks. This definition is a very broad one, which allows the use of Information and Communication Technology (ICT) as a communication and delivery tool between individuals and groups, to support students.

Furthermore, According to the European Commission (2001) and the "The eLearning Action Plan" eLearning is defined as: "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 exchanges and collaboration". This definition implies that eLearning improves quality of Learning, Education and Training (LET) by access and services.

More recently, this definition is expanded to include mobile and wireless learning applications (Nyíri, 2002; Chinnery, 2006). M-Learning is providing a real everywhere anytime learning.

From the above definitions we observe that the common criteria between them are:

- ELearning is facilitated by the use of ICT to enhance the learning performance and efficiency.
- ELearning is used as part of a development process (learning, education, and teaching).
- ELearning includes the delivery of content via internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, and CD-ROM.
- ELearning needs Interactions between different parties to enhance learning and teaching.
- ELearning improves quality of LET.

Searching for more definitions in the literature, one finds hundreds of these definitions (Oliver, 2005); this implies that there is no clear definition of the term eLearning. Even these definitions are sometimes exclusive, sometimes contradictory with each other. In general eLearning has technological view point (Internet-based learning, Web-based learning, online learning, and computer–based learning) and pedagogical perspective (Learning theories, instructional strategies, and pedagogical approaches). But eLearning experiences were disappointed for learners because they concentrated on technology and not on results (e.g. cost reduction, isolated individuals, one way communication, asynchronous, and replacement to face-to-face).

ELearning is not only content related (Abrami et al., 2008). Now eLearning is understood as a learning process that is enhanced by technology, concentration is on quality, content, pedagogy, standards, institutional change, added value to learning, two-way interaction, blended with face-to-face, asynchronous and synchronous, community of learners, and others, communication, social interaction and high quality interactive learning material.

In this study eLearning is defined as a type of learning, education and training that incorporates communication, efficiency and supported by information and communication technology (ICT) to improve the quality and effectiveness of learning. Learning is a social activity that needs communication to overcome the isolation in eLearning as learners and instructors may be in different locations. Efficiency assures that learning process is done in the right way by using eLearning components that are characterized by the minimum conditions for success. ELearning is achieved by the use any form of technology which is the most variable component of eLearning. The more advanced the technology the

efficiency the resources are used. Improving quality and effectiveness of eLearning yields an effective learning to achieve the intended goals of the learning which is the foundation of success.

2.2.2 ELearning Advantages and Disadvantages

ELearning has many benefits compared to traditional classroom teaching. The most obvious being flexibility with learners not having to leave their place of work or having to travel long distances. In addition, eLearning can offer common environment to formulate online learning communities where users can learn collaboratively. Furthermore, content material in eLearning can be updated and then distributed again easily and quickly and everyone can receive the same content in the same way. Also, it could be applied with different pedagogical methodologies. Other benefits include: multimedia capability, increased reliability, web browser software and Internet connections are widely available , inexpensive worldwide distribution, ease of update, just-in-time, personal, adaptive, user-centric, travel cost and time savings, can take it multiple times (improved retention, comprehension).

However, eLearning also has disadvantages and challenges. Some examples are: the technology needed in eLearning is not always available for access and use; students are not satisfied with the use of ICT in the learning process and feel lack of personal interaction. While other disadvantages include: cost (longer development time), developer limitation, type of content (not all content is suitable for eLearning), learner motivation and initiative, loss of a live (physically present), and portability. Moreover, eLearning has challenges especially in developing countries such as: course challenges, individual challenges, technological challenges and contextual challenges as identified by Anderson and Grönlund (2009).

These disadvantages and challenges raise the issue of quality in eLearning to front. This is why huge interest research had focused on the quality of eLearning and starts many research to developing quality models and eLearning initiatives to enhance and improve eLearning particularly in the higher education institutions.

To conclude, the problem in these days is not to use or not to use eLearning. ELearning is there to stay and is spreading more and more each day. The problem is how to develop, design and implement eLearning that satisfies the needs, requirement of it users.

2.3 Quality

In this section quality definitions will be discussed and interpreted from different views and perspectives. Then a conclusion on a quality definition will be introduced.

2.3.1 Quality in General

Quality is a widely used term, but few agree on what quality is. In general, quality is hard to define, easy to recognize in its absence (Kitchenham & Walker, 1989). The term quality – derived from the Latin term "quails", meaning 'of what kind'- is abstract and not easy to handle. Researchers have given various definitions to quality in different contexts.

Deming defined quality as "Whatever the customer needs". Deming's basic philosophy is that quality and productivity improve as variation decreases. Deming had emphasized the importance of customers and continuous improvement. Juran defined quality as "fitness for purpose". This definition refers to requirements and product characteristic, because satisfying customer expectations or specifications is very hard to achieve. Juran proposed three fundamental managerial processes for the task of managing quality, these are: Quality Planning, Quality Control, and Quality Improvement. He emphasized that in any good and efficient quality management quality actions are to be planned, improved and controlled. Quality is assured by ensuring that each individual has the building blocks necessary to do his or her job properly.

Garvin (1984) in his article titled "What does product quality really mean?" Concluded "Quality is a complex and multifaceted concept" and gave a definition of five different approaches (transcendental, user-based, product-based, manufacturing, and value-based perspectives) to product quality that also gained attention in the software engineering community.

Each of these definitions came from different perspectives and emphasizes different issues. For instance, Crosby's definition had a producer perspective, and Deming's and Juran's definitions had a user-based perspective, the ISO and IEEE definitions focused on satisfying the customer's need.

From the above discussion it can be noticed that there is no single quality definition, even though these definitions are related and complements each other. In order to define quality in the right perspective, it is important to study the meaning of quality in the situation that is under study (Lagrosen, Hashemi, & Leitner, 2004), and quality implementation depends on the type process at hand (Gilmour and Hunt, 1995, as cited in Nichols, 2002). Therefore, the following subsections related to quality in software, quality in higher education and quality in eLearning will be introduced. Then a quality definition will be adapted and adopted related to this study and verified based.

2.3.2 Quality in Software

Software quality is an essential and a critical one in almost all software because it has a central focus in our life. In these days, software users are looking for high quality software to use, and are willing to pay for that quality, and also management are looking forward to reduce cost of defective products and are looking for prevention actions. The issues of software quality are not new, and it had been started many years ago.

Software quality can be defined from many points of view. These include the developer (a stable set of clear requirements); the customer (value-for-money and a system that performs correctly); and, the maintainer (bug free system with clearly structured documentation). International organizations such as the International Standards Organization (ISO) defined quality as: "the totality of features and characteristics of a product or service that bear on its ability to satisfy specified or implied needs" (ISO, 1989). The IEEE defines quality as "the degree to which a system, component, or process meets specified requirements and customer or user needs or expectations" (IEE std 1074, 1998).

Quality in software can be achieved with fitness for use (characteristics such as usability, maintainability, and reusability) and conformance to requirements (that software has value to the users). Deming (1992) argue that software quality attained by greater emphasizes to customer satisfaction. This view is also supported by Vallabhaneni (1990) when he defined software quality in terms of features software must include: satisfy user requirements, has few errors, efficiently functioning, operates easily and has good user documentation.

Software quality defines what must be done and how it must be done. Software should function correctly with respect to a specification and possess attributes other than correctness with respect to a specification. What determines software quality? how to assess and assure software quality will be discussed in more detail in section 2.4.

2.3.3 Quality in Higher Education

Quality in Higher Education (HE) is becoming more and more important in these days. Many different meaning exists for quality in higher education. That is why different quality approaches were proposed for measuring, managing and assuring quality in HE (Arjomandi, Kestell & Grimshaw, 2009). So, what does quality mean in higher education?

Higher Education Institutions (HEIs) are obliged to seek and maintain quality for the courses they are offering (Chua, 2004) to improve their effectiveness (Srikanthan & Dalrymple, 2001) due to many forces. These forces includes: accountability, greater expectations of students, costs, economical forces, socio-cultural and competitions (Becket & Brookes, 2008). This led to the adoption of a variety of quality management models across HEIs (Brookes & Becket, 2007).

Quality in HE is more difficult to define than in most other fields (Vettori, Lueger & Knassmueller, 2007). The issue of what constitutes high quality learning and teaching is very important. High quality teaching is fundamentally about affording high quality student learning (Ramsden, 1992), and keeping focus on how and what students are learning, and how it can be improved. Quality in HE is not new and has been of great importance, but the way in which it is perceived and handled is new (Vettori et al., 2007).

Harvey and Green (1993) discussed the nature of quality in the context of a university and identify five discrete but interrelated categories about quality in HE. The key aspects of each of these categories can be summarized as follows (Watty, 2003):

- Quality as exception: distinctive, embodies in excellence, passing a minimum set of standards. This definition is the traditional academic view to be the best.
- Quality as perfection: zero defects, getting things right the first time (focus on process). This definition is more appropriate for industry as it looks for producing the same product which is not the case in academic.
- Quality as fitness for purpose: relates quality to a purpose, defined by the provider. This definition with customer needs requirements and desires.
- Quality as value for money: a focus on efficiency and effectiveness, measuring outputs against inputs. A populist notion of quality (government).
- Quality as transformation: a qualitative change; education is about doing something to the student as opposed to something for the consumer. Includes concepts of enhancing and empowering.

The first four conceptions, reflect the interests of external stakeholders such as funding agencies and students as potential consumers, as recognized by Owlia and Aspinall (1996). Transformation, on the other hand, is associated with quality improvement rather than quality assurance and is more likely to be adopted by internal stakeholders such as university managements. Transformation may be seen as incorporating, to a certain extent, each of the other conceptions of quality. Watty (2003) suggests that the dimension of quality as perfection can be removed, since HE does not aim to produce defect-free graduates. The products of HE, the graduates, are not expected to be identical, and this is not considered to be applicable to HE. Lomas (2001) suggests that fitness for purpose and transformation seem to be the two most appropriate definitions of quality, according to small-scale research with a sample of senior managers in HEIs. Because fitness to purpose requires that the product or the service satisfies customer needs, requirements or desires.

Furthermore, Chua (2004) interpreted the quality for HE in terms of the Input-Process-Output (IPO) framework, derived from West, et al. (2000)'s viewpoint of quality. Input refers to the entry requirements, process to the teaching and learning process, and output to the employability and academic standings.

As mentioned early, quality in HE has many definitions. Therefore, Biggs (2001) suggests that to describe quality in HE context one mechanism is to ask the question “are our teaching programs producing the results we say we want in terms of student learning?” Haworth and Conrad (1997, suggest that high quality programs are those that “contribute to the learning experiences of students that have positive effects on their growth and learning”. Also, by specifying the education goals, allowing students to achieve these goals (Sparkes, 1995) and taking into account academic standards, society expectations, student inspiration. Tribus (1994, pp. 37-40) believes that the objectives of every school, or university, should be to give each student, opportunities to improve in knowledge, know how, wisdom, and character.

From the above discussions, quality in education is more related to transformative which emphasizes enhancement and added value to teaching and learning, should be developed taking into account different stakeholders view. Managing quality in HE can be achieved by integrating different quality approaches views to enhance and increase outcomes.

2.3.4 Quality in eLearning

Quality in the field of eLearning is becoming more and more important (Koohang & Plessis, 2004; Albeanu, 2007) in both researchers' and practitioners' communities (Lanzilotti, & et al, 2006), and not associated with a well-defined measure (Pawlowski, 2003), very broad and complex one and therefore not easy to handle (Hildebrandt & Teschler, 2004a). Supporting and enhancing quality in eLearning is challenging (Schreurs, 2006). So, what does quality in eLearning mean? From whose point of view quality is examined? In which context quality should be measured? Finally how can we assure that the eLearning goals have been met, and to what extent goals and objectives have been achieved?

The importance of quality in the field of eLearning has been emphasized by many international organizations (Ehlers, 2004; Pawlowski, 2007) including:

- International Standardization Organization and International Electro technical Commission Committee (ISO/IEC JTC1 SC36)
- Learning Technologies Standardization Committee (LTSC) from the IEEE
- European Committee for Standardization (Comit´e Europ´een de Normalisation, CEN)
- UNESCO/OECD (2005)

The quality of eLearning is not a well defined measure (Pawlowski, 2003). It is very abroad and complex and not easy to handle (Hildebrandt & Teschler, 2004a). Reviewing the available literature reveals that the issue of quality for eLearning had been studied by many researchers aiming to improve the eLearning outcomes. Watty (2003) identifies two schools of thought with respect to the definition of quality. The first is quality to a context, which references to the quality of assessment, academic programs, teaching and learning, the student experience and program designs ((Hildebrandt & Teschler, 2004a). The second is a variety of stakeholders in HE (Middlehurst, 1992; Harvey and Green, 1993; Dondi, 2009). The eLearning stakeholders are those that are affected by it (Wanger, Hassanein, & Head, 2008). They include Students, Instructors, Educational Institutions, Content Providers, Technology Providers, Accreditation Bodies, and Employers. Each stakeholder has its own perspective on quality and including these perspectives improves the quality of eLearning and eLearning process (Ehlers, (2007).

Ehlers (2004) investigated the quality in eLearning from three different dimensions that need to be distinguished. These dimensions are (see Figure 2-1):

- Different meanings of quality;
- Different quality perspectives; and
- Different levels of the educational process to which quality can apply.

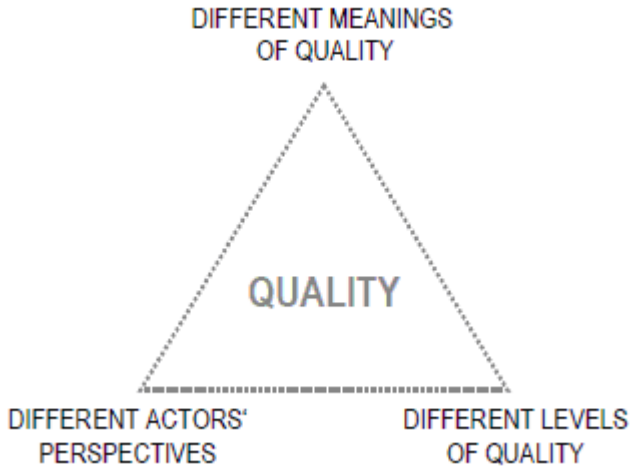

Figure 2-1: Multiple perspectives on quality in eLearning (adapted from Ehlers, 2004)

Ehlers states further on that "according to quality and evaluation research an educational process can be subdivided into five subsections or sub processes: context-quality, structure-quality, process-quality, output-quality or impact-quality". Furthermore, Nichols (2002) has recognized five levels of eLearning. They are Information Repository, One-Way Communications, Online Exercises, Two-Way Communications and Learning Objects. Nichols has also explained four distinct quality assurance procedures: The training process: quality assurance for eLearning levels one to three; the consultancy and training process: for development at level four; The full project process: used in the development of major learning objects (level five) and development of courses into resource-based learning mode; the minor / single task project process: that ensures quality in additional activities. Quality in eLearning applies to each of those sub sections differently.

Beside the aspect of the learning and teaching activity, quality in eLearning and e-teaching also refers to the processes and products involved like: platform, means the software solution used, content and how it is prepared, way of delivery, and service.

The different perspectives of quality, indicates that quality has both subjective dimensions (expected and perceived quality), such as educational paradigms, teachers' role, etc. and objective dimensions (fitness for use or conformance to specification) such as accessibility, interface design, and other technical and infrastructural features, both of which need to be considered in any attempt to define quality (Dondi, Moretti, & Nascimbeni, 2006).

2.3.5 Section Summary

For the purpose of this study the ISO and IEEE definitions are the best definitions that suites eLearning in general. Developing eLearning requires a system life cycle process and eLearning system is a product and we want to assure that the development processes meets the specified requirements and be able to measure the quality attributes of the designed software to ensure higher quality software products.

Quality in the field of eLearning should consider all the factors that influence the successful implementation and should be seen from different view and perspectives.

In this study Ehlers' definition for quality in eLearning is adopted because it is seen as the most flexible definition. Quality of eLearning has different meaning; different perspectives and quality should be applied to the different eLearning process aiming to improve the quality of learning which at the final stage improves the outcome of the learning process.

2.4 Software Quality Models

In what follows, a briefly discussion of the most important software quality models will be introduced. Followed by, a comparison between these models to find similarities and differences between them. Lastly, a criticism of the models is introduced. These models have been studied and analyzed to:

- Identify the most important quality factors that should be included in the proposed eLearning quality mode.
- Feature standard quality characteristic and associated sub-characteristics.

A quality model is defined as "the set of characteristics and the relationship between them which provide the basis for quality requirements and evaluating quality" (ISO 1986) or as a structured set properties required for an object of class to meet defined purpose" (Fusani, 1995).

In the literature of software quality models, different authors have proposed different models for example: McCall's quality model that was proposed in 1976, Boehm's quality model in 1978, FURPS quality model in 1987, ISO 9126 quality model in 1991 and Dromey's quality model in 1996. These models are used for software systems evaluation and thus it is likely that they include characteristics that are not suitable for eLearning.

The McCall, Richards and Walters (1979) software quality model reflects both the users' views and the developers' priorities (Al-Qutaish, 2010) and defines the quality of a software product from three major perspectives: product revision (ability to undergo changes), product transition (adaptability to new environments) and product operations (its operation characteristics). The McCall's model classifies quality attributes into a hierarchy of three levels. Level one, "quality factors" from a customer or user perspective. Level two, the "quality criteria" represents technical concepts. Level three, the "quality metrics", measure the attributes of software products. The last two levels are from engineering perspectives.

Boëhm's (1978) proposed a quality model similar to McCall's model with an emphasis on the maintainability of software product. It consists of high-level characteristics (requirements of actual use), intermediate-level characteristics (qualities expected from software) and lowest-level (primitive) characteristics (for defining quality metrics). Boëhm's model considers as-is utility from various dimensions, considering the types of user (Portability, as-is Utility and Maintainability). While, "as-is-utility" includes

Reliability, Efficiency and Human Engineering, Maintainability focuses on Testability, Understandability and Modifiability. The top level addresses the concerns of end-users and bottom is of interest to technically inclined personnel and this means emphasize on the user.

In 1987, Robert Grady and Hewlett-Packard Co. proposed a quality model that is based on requirement analysis and modeling called FURPS Quality Model (Vinayagazundaram & Srivasta, 2007). FURPS decomposes quality characteristics for each activity in the software process (Ahamed, 2010) into two different categories:

- **F**unctional requirements (defined by input and expected output such as Feature set, Capabilities, Generality and Security) and
- Non-functional requirements which include
  - **U**sability: Human factors, Aesthetics, Consistency, Documentation
  - **R**eliability: Frequency/severity of failure, Recoverability, Predictability, Accuracy, Mean time to failure,
  - **P**erformance: Speed, Efficiency, Resource consumption, Throughput, Response time and Supportability: Testability, Extensibility, Adaptability, Maintainability, Compatibility, Configurability,
  - **S**erviceability: Installability and Localizability

ISO/IEC (1991), proposed the standard ISO/IEC 9126 to provide a framework for the evaluation of software quality. ISO/IEC 9126-1 contains a two-part quality model: 1) Internal and external quality of a software product obtained by reviews of specification documents, checking models, or by static analysis of source code and 2) Quality in use of software product properties of software interacting with its environment and refers to the quality perceived by an end user. The ISO/IEC 9126 is based on the six characteristics namely, functionality, reliability, usability, efficiency, maintainability, and portability. Each of these characteristics has further sub characteristics (Zeiss et al, 2007), and these are decomposed into attributes (Xavier & Marco, 2003).

Dromey (1995) proposes a product-based quality model, which recognizes that quality evaluation differs for each product and that a more dynamic idea for modeling the process is needed to be wide enough to apply for different systems. Dromey's Quality Model is focusing on the relationship between the quality attributes and the sub-attributes, as well as attempting to connect software product properties with software quality attributes. The main idea to create this new model was to obtain a model broad enough to work for different systems. Dromey proposes three models, depending on the products resulting from each stage of the development process: requirements model, design model, and implementation quality model (programming) (Ortega, Pérez & Rojas, 2003).

To sum up, most of the quality models discussed above is dealing with quality from users' view or product view. This can help partially in eLearning because learning process can not be considered only from the production of software or content. More concentration should be given to the learning process.

2.4.1 Software Quality Model Comparison

The previously discussed models have used different terminologies for describing the quality aspects and characteristics (Buglione & Abran, 1999) as shown in Table 2-1. These terminologies will be used interchangeably in this thesis.

Table 2-1: Software quality models terms (adapted from Buglione and Abran, 1999)

Layer	McCall	Boehm	FURPS	ISO/IEC 9126	Dromey
Layer1	Factor	High Level Characteristic	Factor	Characteristic	H-Level attribute
Layer2	Criteria	Intermediate Characteristic	Criteria	Sub Characteristic	Subordinate attribute
Layer3	Metric	Primitive Characteristic	Metric	Metric	

All the software quality models discussed here are hierarchal models. They divide quality into characteristics and these characteristics are further divided into sub characteristics and then to metrics. The major contribution of the McCall's model is the relationship created between quality characteristics and metrics, whereas; Dromey's model is a dynamic idea for modeling the process on three prototypes and pinpoint the properties of the software product that affect the attributes of quality. The factors in these models are not independent; they interact with each other and often cause conflict, especially in the software development process.

McCall's model of software quality incorporates 11 criteria encompassing product operation, product revision, and product transition. Boehm's model is based on a wider range of factors and criteria. ISO 9126 incorporates six quality characteristics, each one having a large number of attributes. ISO Model includes a number of criteria under its goal of maintainability.

Boehm's and McCall's models appears very similar, the difference is that McCall's model primarily focuses on the measurement of the high-level characteristics "As-is utility", whereas Boehm's quality mode model is based on a wider range of characteristics and focuses on primarily maintainability, also concentrates on the user's needs and hardware characteristics which are not included in McCall's model (Ortega et al., 2003). In comparing Boehm's model with the ISO 9126, additional characteristics like Process-Maturity and Reusability are noticeable. It is important to point out the weighting Dromey gives to Process Maturity, which is not considered in previous models (Ortega et al., 2003).

Table 2-2 shows a comparison between these models and the quality characteristics in each of these quality models. We can observe the following points:

- Reliability is discussed in all five models.
- Efficiency, Usability and Portability are discussed in four models.
- Functionality and Maintainability are discussed in three models.
- Testability and Reusability are discussed in two models.
- Integrity, Correctness, Flexibility, Modifiability, Supportability, Understandability, Performance and Human Engineering are discussed in one model.

Table 2-2: Comparison of software quality models

Characteristic	McCall	Boehm	FURPS	ISO/IEC 9126	Dromey
Usability	√		√	√	√
Integrity	√				
Efficiency	√	√		√	√
Correctness	√			Maintainability	
Reliability	√	√	√	√	√
Maintainability	√			√	√
Testability	√	√		Maintainability	
Flexibility	√			Maintainability	
Modifiability		√			
Reusability	√				√
Portability	√	√		√	√
Interoperability	√			√(Functionality)	
Understandability		√			
Functionality			√	√	√
Performance			√		
Supportability			√		
Human Engineering		√			

2.4.2 Software Quality Model Criticism

The product models, McCall's, Boem's models, and ISO 9126 model had been criticized from different views. One of these is the lack of criteria of characteristics and sub characteristic. The sub characteristics are not related to single quality characteristic. For example McCall quality factor flexibility is influenced by quality characteristics of self-descriptiveness, expandability, generality, and modularity. The same quality sub characteristics also influence the quality factors reusability, interoperability, testability, and maintainability. Sub characteristics of the ISO 9126, influences only the level above it and thus it is a hierarchical model. Quality attributes are not independent of each other. For example, the reliability of a software system influences its usability or the portability can have an influence on the maintainability. Hence, there is an overlap that needs to be considered.

The models recommend to measure quality directly, but no model states how to measure it (Rawashdeh & Matalkah, 2006). In addition, none of the existing models attempts to relate certain characteristic with the type of stakeholders.

Wanger, and Diessenboeck (2007) stated that these models define quality by breaking it down into the well-known quality criteria which in turn are broken down into more specific sub-criteria. Until now, these models have failed to establish a broadly accepted definition of quality because they mix criteria from different dimensions and fail to describe characteristics precisely enough to be actually assessable.

The characteristics that are addressed and presented in more than one model are the most important ones. Accordingly, they will be essentially considered and focused on in this thesis.

From this review of software quality models, they are all hierarchal, concentrates on user satisfaction from different views and product quality. The most important quality characteristics discussed are: reliability, efficiency, usability, functionality. These characteristics are internationally accepted and represents in all most software quality models. Therefore, these will be incorporated for quality of eLearning.

2.5 Quality Management Approaches

The absence of quality standards specific to education sector leads to the use of general quality management approaches developed for industry (e.g. EFQM model, ISO-9000, MBA, Balance Scoreboard, etc.) to manage and enhance quality in HEIs. Higher Education Institutions are inspired to go for some sort of quality management system in order to gain competitive advantage and to promote a strategic development of educational institutes (Singh & Sareen, 2006).

The following is a summary of some quality management systems and approaches used throughout the world. The summary, serves as an introduction to find the most important characteristics of a quality management system.

2.5.1 ISO 9000 Standard

ISO 9000 is a set of quality standards that assist an organization to identify, correct and prevent error, and promote continual improvement. The main aim of this standard is to help organizations in implementation and operation of a quality management system.

The ISO 9000 standards were first published in 1987, revised in 1994, 2000, 2005 and lastly revised in 2008. This standard consists of four standards, these are: ISO9000, ISO9001 Quality management systems—Requirements, ISO 9004 Quality management systems— Guidelines for performance improvements, and ISO 9011 (Guidelines for revision of quality management systems).The changes in this standard are designed to meet the needs of service sector including education sector, continual improvement, resource management, and to improve integration of quality management systems with other management systems. These changes represent a more user friendly standard for educational institutions. The main purpose of ISO 9000 in education is to provide confidence to the professionals, students and their parents, and various stakeholders.

The quality management system as proposed by ISO 9000 consists of eight management principles: Customer focus, Leadership, Involvement of people, Process approach, System approach to management, continual improvement, Factual approach to decision making, and mutually beneficial supplier relationship.

The standard looks at the system as a series of processes related to each other and the output of a process is the input of another process. These processes are sub divided into three categories, these are: managerial processes, main processes and support processes. The ISO organization states that ISO 9000 is concerned with quality management that is "conformance to customer's quality requirements, enhancing customer satisfaction and achieving continual improvement of performance in the area".

ISO 9000 norm is considered as a generalized specification of quality assurance with elements from TQM. That is why the norm does not state how management and production should be organized. Organization can use the norm to help determine what is needed to maintain an efficient quality conformance system.

In summary ISO 9000 standard is concerned with conformance to requirements and procedures and identifies process to manage quality

2.5.2 European Framework for Quality Management Excellence Model(EFQM)

The EFQM excellence model is a generic quality management framework, which is used in any organizations regardless of its size and work. The objective of the EFQM model is to support organizations to achieve business excellence through continuous improvement and deployment of processes. The main aim of EFQM is to find the focus areas with possible weaknesses where improvements can be accomplished (gap analysis). The EFQM model is, thus, a business system to cover all management areas with balanced considerations.

The EFQM excellence model comprises five "enabler" criteria: leadership, policy and strategy, people, management, resources and partnerships, and processes. It also comprises four "results" criteria: customer satisfaction, people satisfaction, impact on society, and key performance results (EFQM, 2000). EFQM gives the maximum weight to customer focus, business result, processes, leadership, people management, people satisfaction, resources, policy and strategy, and impact on society in order of importance.

EFQM excellence model is based on systematic improvement of operations, based on principle of continuous improvement known as the Deming Quality Cycle (plan, do, check and act). The model guide education providers to pay attention to aspects that are important in terms of quality, but do not provide an answer about how providers should operate.

2.5.3 The Malcolm Baldrige National Quality Award (MBNQA)

Malcolm Baldrige National Quality Award (MBNQA) was established by US congress in 1985 aiming at spreading quality awareness. The MBNQA was established to enhance competiveness. The criteria focus on results and continuous improvement. They provide a framework for designing, implementing, and assessing a process for managing organization operations. One of the arguments that the MBNQA is preferable over other

similar self-assessment models is that it is based on common sense, basic requirements and not focusing on procedures.

It is based on seven core values: leadership, strategic planning, customer and market focus, information and analysis (measurement, analysis and Knowledge management), human resource focus, process management and business results. MBNQA is not a standard, it is just a tool to measure the organization's strategic planning, based on results and customer satisfaction. The seven Criteria (Categories) are subdivided into Items and Areas. There are 19 Items, each focusing on a major requirement, and consist of one or more Areas to Address (Areas). Organizations should address their responses to the specific requirements of these Areas.

In eLearning the core criteria remain the same for these sectors, except where Customer and market focus will be replaced by Student and Stakeholder focus; and Human Resources focus will be replaced by Faculty and staff focuses.

Briefly, MBNQA focuses on results and continuous improvement and measure the organization's strategic planning, based on results and customer satisfaction.

2.5.4 Comparison of Quality Management Approaches

All the three quality management approaches where developed for manufacturing and business organizations and based on TQM philosophy. All the three quality approaches are concentrating on the process-oriented approach to enhance and produce quality improvement in institutions.

Table 2-3 shows a comparison between the quality management systems, and TQM tools. From this table we can notice that all three management approaches focuses on leadership, people, processes, and customer results. Policy and strategy is discussed by EFQM and MBNQA only. Partners and resources, People result, Society results, Key performance results, Customer focus, System approach, Continual improvement, Factual approach, Human resource focus and Measurement, Analysis, and KM are discussed only by one management approach.

Both MBNQA and EFQM define quality as customer–driven while ISO 9000 defines it as conformance to customer. Also, ISO 9000 tells what to but not how to do it.

Both MBNQA and EFQM are based on defining main quality factors (goals) and providing some criteria to measure and assess quality excellence, while ISO 9000 is a generic quality management system, aims to produce a quality system to satisfy customer requirements based on elements from TQM.

A concern of the three models is a focus on the student learning experience, especially due to forces such as increasing international competition, accountability and stakeholder expectations, impacting on higher education.

Table 2-3: Comparison between different quality management approaches

Concept	EFQM	MBNQA	ISO 9000
leadership	Leadership	Leadership	Management responsibility
Policy and Strategy	Policy and strategy	Strategic planning	
Internal cooperation	People	Human resource focus	Resource management
External cooperation	Partnerships and resources		
Customer satisfaction	Processes	Customer and market focus	
Process management	Processes	Process management	Product/Service realization
Results	Customer results	Results	customer focus
People results	People results		
Society results	Society results		
Key performance results	Key performance results		
Continuous improvement		Measurement, analysis, and knowledge management	Measurement, analysis and improvement
Management system			Quality management system
Factual approach			Factual approach

Within the field of eLearning leadership, people, customer results and policy and strategy are very important and can be identified as:

- Leadership to ensure that HEIs are going towards excellence and achieving missions and vision of the institutions.
- People to ensure that staff is continuously improving skills, knowledge and motivated to perform better job.
- Customer results to ensure that students are the focus to achieve high results.
- Policy and strategy to ensure that quality mission are achieved in a systematic way.

From the above comparison and discussion, quality management in higher education and eLearning should be seen as a continuous improvement and deployment of processes that focuses on stakeholders and the production of quality learning.

2.6 ELearning Critical Success Factors

The first question in this study was: *What are the Critical Success Factors needed to support the analysis, design, development, implementation, delivery and management of a quality eLearning within HEIs?* This section reviews and explores the Critical Success Factors (CSFs) in quality eLearning, and attempts to develop a set of CSFs from literature in the field that will lead to build a quality model for eLearning environment to enhance the effectiveness and efficiency of eLearning.

In order to create a successful eLearning, it is important to identify what determine success in eLearning. The failure of the first eLearning programs (e.g. UK e-University, Universities 21, etc.) to realize there aims and goals were due to many reasons. One major reason was the failure to provide quality content and to create an effective, interactive eLearning (Engelbrecht, 2003). Another reason was the concentration on the technology only while developing eLearning. ELearning is not a matter of access to technology or only as a matter of implementation (EC, 2003). Also, not considering the different users styles and perspectives were other failure issues. Money (2004) believes success should always begin with the individual. If users don't accept it, the system becomes a failure. Also, different views of learners make it difficult to consider that one size fits all (Schulmeister, 2004). Aggarwal and Makkonen (2007) stressed that one size does not fit all for eLearning. This is due to different learnig styles and preferences of learners. According to Phillips (2002), failure in eLearning can occur at three levels:

- Product level: poor course design; inadequate technology infrastructure;
- Learner level: poorly prepared learners, lack of motivation, no time; or
- Organizational level: low managerial support, lack of reward structure.

Therefore it is important to identify the issues and conditions that will help HEIs to develop and implement sustainable eLearning initiatives.

CSF can be defined as the areas that should be addressed that will ensure successful development and implementation (McPherson & Nunes, 2006). CSF can influence, enhance, assure, and improve the success of eLearning environment. ELearning environment is all the factors that belong to the eLearning situation (e.g. LMS, content, design, etc.), which are manipulated by the system or the predefine conditions for the system (e.g. technical infrastructure, legal system, etc.) (Richter & Pawlowski, 2007; Pawlowski & Richter, 2008).

CSF analysis is a top-down methodology for examining factors affecting change. Marshall and Eardley (1998) argue that the identification of CSFs is a fundamental tool in acquiring a holistic understanding of the process and is therefore an important tool in creating successful implementation strategies.

The next two sub sections will introduce a review of the most important papers related to critical success factors in eLearning and synthesize a set of critical success factors.

2.6.1 Review of Critical Success Factors

This review will focus on eight major papers which had been discussed repeatedly in the literature. These major papers are shown in Table 2-4. Most of these studies are based on extensive literature review or respective authors' knowledge and practices. There findings are discussed and synthesized in a set of eLearning critical success factors.

Different sets of CSFs have been proposed by different authors. Lee-Post (2009) while trying to answer the question "what constitutes success in eLearning?" noticed that different researchers and practitioners produced different findings. These findings include: learning benchmarks, learning styles, learning environment, teaching practices.

Volery and Loerd (2000) based on previous studies conducted an empirical study and identified three critical success factors for success in online education:

- Technology: ease of access and navigation, interface design, and interaction
- Instructor: deals with instructor attitudes towards students, instructor technical competence, instructor teaching styles, and class room interaction
- Previous use of technology: identifying student previous use computers

Table 2-4: Papers on critical success factors

Author(s)	Year	Paper title	No Cited[1]
Volery & Lord	2000	Critical success factors in online education	239
Alexander	2001	ELearning Developments and Experiences	195
Khan	2001	A Framework for ELearning	31
Govindasamy	2002	Successful implementation of eLearning Pedagogical considerations	242
Frydenberg	2002	Quality Standards in eLearning: A matrix of Analysis	86
Fresen	2007	A Taxonomy of factors to promote quality web-supported learning	21
Selim	2007	Critical Success Factors for eLearning Acceptance: Confirmatory Factor Models	126
Sun et al.	2008	What drives a Successful eLearning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction	152

This study is based on students perspectives and a small number of students particularly 47 student in on-campus course. The assumption on students' previous use of technology alone can be expanded to include instructors' use of computers and managing technology to introduce and produce effective eLearning.

[1] Citation numbers are from http://scholar.google.com/ on September 16, 2011.

Alexander (2001) proposed framework for the design, development and implementation of eLearning systems in higher education. This framework is based on Trigwell's work on levels of influence on students learning (Student experience of learning, Teachers' strategies, Teachers' planning and thinking and Teaching/learning context). She concludes that for eLearning to succeed it must be based different factors. These factors are:

- University context: Includes developing an eLearning vision, technology development plan, development of strategy, and reliable technology network and support to students and faculty.
- Teachers' thinking: by developing teaching strategies to suite students needs and styles and staff development.
- Teachers' planning: in planning phase of eLearning emphasis is on understanding students, design of different learning activities that reflect objectives, timely feedback, working in groups, context of implementation and copyright clearance on all materials ; and
- Teachers' strategies: feedback to students, support prior knowledge of eLearning, support before student entering eLearning courses.

Alexander (2001) emphasized that HE needs to consider the entire university context to develop a successful eLearning environment. Because the eLearning is a complex system composed of many inter-related parts. Also, she concludes that successful eLearning takes place within a complex system involving the students' experience of learning, teachers' strategies, teachers' planning and thinking, and the teaching/learning context.

Khan (2001) while answering the question "What does it take to provide the best and most meaningful environment for eLearning?" developed eight dimensions for this purpose. These are: institutional, pedagogical, technological, interface design, evaluation, management, resource support, and ethical.

- The institutional dimension focused on aspects and issues affecting the organization such as administrative affairs, academic affairs and student services.
- The pedagogical dimension focused on aspects touching learning and teaching in eLearning.
- Technological dimension is concerned with aspects on the hardware and software, planning of infrastructure used.
- Interface design is concerned with the look and feel of eLearning programs.
- Evaluation covered aspects such as assessment of learners and evaluation of the learning and teaching environment.
- Management is concerned with aspects such as maintenance and distribution of information.
- Resource support is concerned with all types of online support and both offline and online resources.
- Ethical dimension focused on aspects such as social, cultural diversity, bias, geographical diversity, learner diversity, legal issues and the likes.

The above framework provides a list of considerable factors that would be needed for the creation of a successful experience for diverse learners, may also be used for strategic planning and program improvement (Khan, 2001). Khan's framework from a wide

perspective can be seen as an instructional design model and provides a good baseline for assessing eLearning projects. Also, the framework can be used to identify the critical issues of an eLearning environment. The framework for eLearning provides guidance in the planning, design, development, delivery, evaluation, and implementation of eLearning environments (Khan, 2001).

Govindasamy (2002) discussed seven eLearning quality benchmarks namely, institutional support, course development, teaching and learning, course structure, student support, faculty support, and evaluation and assessment. Successful implementations of eLearning environments require an understanding of the technology and pedagogy integration for learning to take place effectively (Govindasamy 2002; Engelbrecht 2003). These factors may be described as: Institutional support, Course development, Teaching and learning, Course structure, Student support, Faculty support, Evaluation and assessment.

Frydenberg (2002) after and extensive review of U.S. quality standards analyzed and organized them into a nine-cell matrix of criteria that are used to examine, compare, contrast, and synthesize the essential elements of eLearning quality. The description of these factors is as follow:

- *The quality of institutional or executive commitment,* related with ensuring the appropriate administrative structure and staff commitment that correspond to the requirements of the development and/or provision of the eLearning product/service.
- *The quality of technological infrastructure,* related with ensuring the development, acquisition and existence of the appropriate infrastructure for the development and/or provision of the eLearning product/service.
- *The quality of student services* related with ensuring that the services offered before, during, and after the using the eLearning are of high standards.
- *The quality of the design and development of eLearning programs and courses*, related with ensuring that the design and development processes of the educational material related with the eLearning product/service are of high quality.
- *The quality of instruction and instructors*, related with ensuring that the quality level of instruction is high.
- *The quality of program delivery,* related with ensuring that the conditions of access to the eLearning services are easy, efficient and transparent to the users.
- The quality of the structures to support financial management and ensure financial health of an eLearning program, related with ensuring the viability of the eLearning product/ service.
- *The quality of regulatory and legal compliance*, related with ensuring that the eLearning follows the regulations and laws under which it aims to get funded and/or be provided.
- *The quality of evaluation processes*, related with ensuring the improvement of the quality assessment processes that the eLearning product/ service development and provision involves.

These are a generic set of quality dimensions of eLearning and a set of quality aspects that an eLearning quality approach aims to improve. Frydenberg analyzed these factors based on how institutions and tutors perceive eLearning quality. Frydenberg (ibid) focused on

considerations for distance education settings, but there are similar concerns in all universities that are utilizing technology to supplement face-to-face teaching or eLearning.

Fresen (2007), based on a comparative analysis of the literature related to eLearning synthesized a taxonomy of critical success factors for quality web-supported learning based on six categories. These factors are: institutional, technology, lecturer, student, instructional design (Usability and Learning principles) and pedagogical factors. He also analyzed and categorized each of these factors to sub factors which specifically explain the feature of respected factors as shown bellow:

- Institutional factors: in terms of technology plan, student consultation, change management, evaluation, and design standards.
- Technological factors: This factor includes appropriate use, availability, reliability, accessibility, IT support, suitable bandwidth and download, and management of student.
- Lecturer factors: includes criteria such as interaction/ facilitation, feedback, academic background, teaching competence and empathy.
- Student factors: communication, time management, self directed learning, critical thinking and problem solving
- Instructional design factors: this factor includes usability (e.g. use of media and modular chunks, layout presentations and accessibility) and learning principles (collaborative, interactivity engagement, high expectations and higher cognitive levels).
- Pedagogical factors: in terms of identifying goals, objectives, expectations, flexible learning packages and assessment strategies.

Later Selim (2007), in his study, identified eight eLearning CSFs: 1) instructor's attitude towards and control of the technology, 2) instructor's teaching style, 3) student motivation and technical competency, 4) student interactive collaboration, 5) eLearning course content and structure, 6) ease of on-campus internet access, 7) effectiveness of information technology infrastructure, and 8) university support of eLearning activities. These were tested and measured, by surveying 538 university students from a sample of 37 class sections. His results revealed that students perceived instructor characteristics as the most critical factor in eLearning success, followed by IT infrastructure and university support.

Sun, Tsai, Finger, Chen, and Yeh (2008) based on 295 responses from students enrolled in 16 different online learning courses in Taiwan identified the following six dimensions as critical factors with thirteen criteria. The main dimensions are: Learner dimension, Instructor dimension, Course dimension, Technology dimension, Design dimension and Environmental dimension. In their study they found that the most influence criteria online learners' satisfaction: computer anxiety, instructor attitude, course flexibility, course quality, perceived usefulness, perceived ease of use, and diversity of assessment. Sun et al. (2008) suggest that the two most significant factors that influence student satisfaction are learner computer anxiety and diversity in assessment.

To summarize, eight studies for identifying critical success factors in eLearning were located within the literature summarized and introduced. These studies have partially

contributed to understanding eLearning success. None of these studies, however, provided a comprehensive examination of all the major issues related to the success of eLearning.

2.6.2 Synthesis of eLearning Critical Success Factors

Table 2-5 presents a summary of the studies discussed in previous section. Each study or article reviewed lists certain CSF areas of focus and considered them basic indicators for success in eLearning.

Table 2-5: Summary of discussed papers on critical success factors

Author	Objective	Origin of factors	Outcome
Volery & Lord (2000)	To Identify critical success factors in online education	Previous studies and Reeves and Hammon work (1994)	Three CSF
Alexander (2001)	Proposes a framework for the successful design, development and implementation of eLearning systems within higher education	Trigwell's (1995) work and levels of influence on student learning, Studies in Australia for eLearning	Four categories
Khan (2001)	What does it take to create a successful eLearning experience for diverse learners?	Literature review and experience	Eight dimensions
Govindasamy (2002)	Identify the pedagogical principles underlying the teaching and learning activities that constitute effective eLearning	Ideas from Quality on Line (2000) and by personal experience based on Pedagogical principles	Seven principles
Frydenberg (2002)	Present a matrix within which to examine, compare, contrast, and synthesize the standards of eLearning quality	Standards of eLearning quality that have been proposed in the literature.	Nine domains
Fresen (2007)	Factors directly affects the quality of web-supported learning	Derived from a comparative analysis of the literature	Six CSFs
Selim (2007)	Specify eLearning critical success factors (CSFs) as perceived by university students.	surveying published eLearning CSFs literature	Eight CSFs
Sun et al. (2008)	Identify critical factors ensuring a successful eLearning design from a holistic viewpoint and guideline for eLearning management	Various literature sources on CSFs that affect learners' satisfaction	Six dimensions

As is evidence, different set of CSFs affecting eLearning presented by previous researchers based on different objectives are basically from descriptive or analytical studies from different dimensions. For instance, some are developed based on the TQM theory (Fresen, 2007). Some is based on students' perspectives (Volery & Lord, 2000; Alexander, 2001). Some are based on the technology acceptance model (Selim, 2007; Sun et al., 2008) that affects the eLearning. Others are based on instructional design theory (Khan, 2001). On the other hand, some of the work addressed is based on pedagogy (Frydenberg, 2002; Govindasamy, 2002). Some factors are similar and can be combined

together such as student support and student services. Some factors could be sub summed under other factors such as previous use of technology could be considered as student factor.

Frydenberg (200) discussed regulatory and legal compliance that are applicable in US in terms of copyright, national requirements, intellectual property law, and export restriction of sensitive information or technology outside US and not from an international concern on quality in eLearning. While finance factor was discussed from turning eLearning to profit for eLearning provider either by student tuition or by selling eLearning course with minimum maintenance or update or by getting fund from the states. As eLearning is in its initial state in Palestine and no other study research discussed in this study mention these as a quality factor that enhances eLearning we decide not to include them in the current model and leave them for future analysis.

In spite of this, these different sets of CSFs can possibly be grouped into a number of generic factors such as Institutional Factors, Pedagogical Factors, Technological Factors, Instructional Design and Interface Factors, Delivery Factors, Content Factors, Cultural Factors, Student Factors, Support Factors, and Instructors' Factors. These are common in eLearning and therefore, they are also believed to be the most important factor to consider.

However, the needs and the new emerging challenges should be considered while developing CSFs for eLearning. Anderson and Grönlund (2009) studied and identified these challenges in developing countries and divided them in four categories (course challenges, individual challenges, technological challenges and contextual challenges). In order to address these issues, new factors should be introduced. Furthermore, these factors are interrelated and interdependent and they should be considered as a whole to produce a successful eLearning. By integrating the common factors and introducing some new ones, the author proposes a more comprehensive set of ten critical success factors to produce successful and quality eLearning. Table 2-6 shows the synthesized critical success factors compared with the ones presented in this section. These factors will be discussed in detail in chapter three.

These CSFs are the result of a systematic way that identifies the factors in a holistic, integrative and comprehensive manner. These CSFs could ensure a successful eLearning design and operation from a holistic viewpoint and present guidelines for eLearning management.

Table 2-6: Synthesized CSF compared with those discussed in this study

Volery & Lord (2000)	Alexander (2001)	Khan (2001)	Govindasamy (2002)	Frydenberg (2002)	Fresen (2007)	Selim (2007)	Sun et al. (2008)	Synthesized CSF 2011
			Course structure			content & design	Course	Content
				delivery				Delivery
		Ethical (social, culture, bias, …)						Cultural
	University context	Institutional	Institutional	Executive commitment	Institutional			Institution
			Teaching & learning		Instructional Design			Instructional Design & Interface
Instructor	Strategies & thinking			Instructor services	Lecturer	attitude& IT control and teaching style	Teacher	Instructor
		Interface design		Design & development			System design	Instructional Design & Interface
		Management						Institution
	Teacher planning	Pedagogical			Pedagogical			Pedagogical
Previous use of technology					Student	IT competency & Collaboration	Student	Student
		Support	Student & faculty	Stud. services		support		Support
Technology	University context	Technological		infrastructure	Technology	Ease of use & Infrastructure	Technology	Technological
		Evaluation (learner & teaching Environment)	Evaluation & assessment (processes)	Evaluation (Learner & processes)			Learner assessment & Interaction	ID & Interface (Goals & objectives & Pedagogy)
				Regulatory & Financial				

2.7 Review of eLearning Quality Approaches

The objective of this section is to establish the background of the various quality implementation frameworks in eLearning. A wide variety of models and frameworks have been developed to enhance and assure quality in the field of eLearning. This review will help in finalizing the necessary background for developing a quality model to manage and enhance the design, development, and implementation of eLearning in higher education.

In what follows, the most important quality models, benchmarks, best practices, including research studies, frameworks, and guidelines for developing and improving quality in eLearning are reviewed and critically presented. In this way it will be able to develop a holistic hybrid quality model for eLearning. Next a critical review of models and works is presented in order to identify and build a complete holistic model.

2.7.1 Benchmarks for Success in Internet-Based Distance Education by IHEP (2000)

The Institute for Higher Education Policy (IHEP) (Phipps & Merisotis, 2000) conducted case studies and a review of current literature on distance education to identify benchmarks used to measure quality and learning. The outcome of this study was the report "Quality on the Line: Benchmarks for Success in Internet-Based Distance Education" which identifies 24 benchmarks that are essential to ensure quality in Internet-based distance education.

The various dimensions include institutional support, course development, teaching and learning, course structure, student support, faculty support, and evaluation and assessment benchmarks. These benchmarks are considered essential to ensuring quality and excellence in online education programs (Garcia, 2007). Also, it is widely accepted as guidelines or benchmarks for learning delivery.

Quality on the Line benchmark is a functional-oriented focuses on the functional areas in the design processes of eLearning. However, the benchmark is not sufficient and does not include many factors such as (attractiveness, motivation, flexibility, accuracy, interaction), and have some limitation (Sherry, 2003), and does not provide methods on how to improve quality (Pawlowski, 2007b). Also, does not provide a clear picture on the design (pedagogical design), content (selecting teaching learning theories) and production (building the application).

2.7.2 Demand Driven Learning Model by MacDonald et al (2001)

MacDonald, Stodel, Farres, Breithaupt, and Gabriel (2001) proposed the Demand Driven Learning Model (DDLM). DDLM was developed in Canada as a collaborative effort between academics and industry experts. The objective was to develop a learning model to guide program design that met the needs, interests, and lifestyle demands of the working adult learner.

The DDLM model is based on the assumptions of consumer demands (quality of contents, delivery and service) and constructivist theories of learning. The five main components of the DDLM are:

- Superior structure- is the foundation required to support the superior quality content, delivery, and service the consumer demands. Structure includes learner needs, learner motivation, learning environment, program goals, pedagogical strategies, learner evaluation, and learner convenience.
- Consumer demands
  - Content: Content should be comprehensive, authentic and researched.
  - Delivery: Delivery is web-based and the interface of eLearning programs should be user friendly with communication tools to support interactivity.
  - Service: Service should include the provision of resources needed for learning as well as any administrative and technical support needed.
- Learner outcomes: Outcomes that meet the demands of the consumer through satisfied learning experience, new skills and knowledge are acquired and practiced.
- Ongoing DDLM evaluation: Continuous evaluation to improve and ensure eLearning effectiveness.
- Continual adaptation and improvement: Continuous improvement to enhance and ensure quality of eLearning

The main focus of this model is to encourage academics to assume a more proactive role in the development and use of technology in the teaching process by emphasizing high quality content, delivery and service. The model put emphasis on the three consumer demands; high quality content, delivery and service (MacDonald et al, 2001). The model also highlights the significance of realizing the changing needs of learners and their employers and the pedagogical changes that must be made to content and services to meet these needs.

2.7.3 Five Pillars of Quality Online Education by SLOAN-C (2002)

The Sloan Consortium (SLOAN-C), an organization dedicated to improve the quality of online education for anyone, anywhere at any time (Sloan, 2008; Moore, 2005), identified the Five Pillars (principles) of Quality Online Education (Bourne & Moore, 2002) as a result of interviews and case studies. These five pillars for quality online learning are:

- Learning Effectiveness: Aims at providing high quality education which includes interactivity, pedagogy, instructional design, and learning outcomes.
- Student Satisfaction: Providing necessary support services which leads to student success. Concentrates on quick and customized services; high-quality learning results
- Faculty Satisfaction: Concentrates on moral and administrative support, reciprocal respect between e-Teachers e-Traditional teachers
- Scale: Aims to continuously improve services while reducing cost such as: use of the technologies to improve the learning efficacy, decrease the drop-out rate.
- Access. To assure that students have full access to the learning materials and services they need throughout their online degree program.

Sloan-C quality framework and the five pillars guide the process of measuring and continuously improving online teaching outcomes (Fresen, 2005) by identifying goals and benchmarks. They do not imply any particular pedagogical approach to eLearning (Stephenson, 2005). Sloan-C's Five Pillars makes higher education more efficient, more cost effective, and more accessible, increase student and staff satisfaction, and improve quality (Rajasingham & Zealand, 2008). The five pillars emphasize the outcomes rather than procedures and inputs (Masoumi, 2010).

2.7.4 Model of Subjective Quality by Ehlers (2004)

Ehlers (2004) investigated quality in eLearning from a learner's perspective and put forward an empirical model representing learners' preferences in 30 dimensions. The 30 dimensions of quality are structured in 7 quality fields (QF). Each of the quality fields (QF) represents a set of criteria of learners' preferences that are clustered in a dimension on the basis of empirical evidence. The model is a result of oral interview with learners. These quality fields are:

- QF 1 (Tutor Support) related to learners preferences, communication and cooperation with the tutor of an online course such as interaction, communication by tutors, learners vs. content centeredness, learner support, etc.
- QF 2 (Cooperation and Communication in the Course) contains quality requirements for the course that learners express, that concern the communication (e.g. online discussions, group activities, and cooperation environment in which they work with other learners in learning groups, with experts or the tutor.
- QF 3 (Technology) refers to adaptivity, synchronous communication and availability of contents
- QF 4 (Costs-Expectations-Benefits) refers to the information possibilities learners have about a course or the institution/organization which is offering the course.
- QF 5 (Information Transparency of Provider/Course) related to counseling on course contents, learning methodology or technical advice. Also, contains content organizational and information about content goals and objectives
- QF 6 (Course structure) contains the structure of an eLearning course to measures personal support of learning process, introduction to technical aspects and content, and tests and exams.
- QF 7 (Didactics) covers aspects of content, learning goals, methods and materials

Ehlers in his model look at quality primarily from a pedagogical point of view and emphasize the learner's perspective. However, he did not analyze in depth aspects related to the design of interactive software systems. Even content is not a separate QF, but included in some of them (QF4, QF5, QF6, QF7).

2.7.5 A Holistic Framework for eLearning Accessibility by Kelly et al (2004)

A holistic approach to eLearning accessibility has been developed by Kelly, Phipps and Swift (2004). This framework puts the user at the center of the development process and promotes emphasis on accessible learning outcomes rather than accessible resources. In

this approach the emphasis is placed on the provision of accessible learning outcomes, and not necessarily on accessibility eLearning resources. This model focuses on the context in which accessible eLearning is developed, arguing that other factors such as local cultural, political and social need to be taken into account. The holistic framework is controlled by a quality assurance policy to assure the quality of the whole process.

The holistic framework for eLearning accessibility incorporates a number of elements that impact accessible learning. It considers the usability of resources, pedagogical aims and infrastructural and resources issues, with the aim of creating solutions that are appropriate to learners' needs. In HE context there is a need for a pedagogical perspective on accessibility for teaching staff to respond effectively to the diverse needs of learners. The pedagogical perspective emphasizes learning and the design of an accessible curriculum. Technical accessibility of resources is also included but only as a meaningful aspect of a well designed curriculum that aims to meet the learning needs of learners.

This model is limited in that it does not include the whole activities of a higher education institute's or the perspectives of stakeholders other than the student.

2.7.6 The ELearning Success Model by Holsapple and Lee-Post (2006)

Holsapple and Lee-Post (2006), based on Information systems (IS) perspective combined with system development phases, proposed an "ELearning Success Model" for eLearning success. This model is a process-oriented approach to define, evaluate and promote success of eLearning courses.

According to this model, success in eLearning is defined as a multifaceted construct to be assessed in three successive stages: system design, system delivery and system outcome. In the first stage the goal is to attain system design success by maximizing the three quality dimensions: system quality, information quality and service quality. The second stage is to attain system delivery success by maximizing the use and user satisfaction dimensions. The final stage is to attain system outcome success by maximizing net benefits dimension. The overall success of eLearning can be evaluated for each dimension. A low score for any success dimension indicates a deficiency in that area and efforts can be spent accordingly to remedy for the deficiency.

This model suggests that a critical factor of eLearning success is the online readiness of the students. The online readiness is based on four readiness measures: academic preparedness, technical competence, lifestyle aptitude, and learning preference toward eLearning. An online-ready student is characterized by a high rating on all four readiness measures. Students' online readiness has a definite impact on their successful course performance and eLearning satisfaction. Holsapple and Lee-Post (2006) based their model on a user centered information system, and the system was build, developed and validated through action research from Information system point of view. Also, this model is centered on the process of designing, developing and delivering eLearning initiatives and does not consider other factors (e.g. institutional context, contextual aspects) in order to develop a holistic model.

2.7.7 The Conceptual Model by Klein et al (2006)

Klein, Noe and Wang (2006) studied the impact of learning goal orientation, delivery mode and perceived barriers and enablers on motivation to learn and course outcomes and proposed a conceptual model.

This model assumes that course outcomes are a direct result of motivation to learn by (Klein et al., 2006). Motivation to learn is a key determinant of the choices individuals make to engage in, attend to, and persist in learning activities. It is influenced by learner characteristics, instructional characteristics (delivery mode either classroom or blended), and perceived barriers and enablers. Perceived barriers (impede progress) and enablers (facilitate progress) are environmental events or conditions that are believed to exist or be encountered and thought to impede or facilitate progress. Perceptions of barriers and enablers are themselves influenced by learner and instructional characteristics.

The conceptual framework for this study integrates training motivation theory and input-process-output (IPO) model of learning. Motivation theory emphasizes that learning outcomes are directly affected by motivation to learn while IPO model suggests that delivery (classroom instruction and blended learning) mode may impact motivation to learn and subsequent learning outcomes (Klein, Noe & Wang (2006).

This model highlights the importance of considering motivation to learn factors, such as building a learning community and learning goal orientation, and its relationship to course outcomes to support an eLearning environment. Also, environmental conditions that affect motivation to learn which impacts performance were identified and emphasized in this study.

2.7.8 Technology, Interaction, Content, Services (TICS) Frame Work for the Quality of eLearning systems by Lanzilotti et al (2006)

Lanzilotti, Ardito, Costabile, and De Angeli (2006) proposed a framework for quality of eLearning systems, called TICS (Technology, Interaction, Content, Services) focuses on the most important aspects to be considered when designing or evaluating an eLearning system. Lanzilotti et al (2006) emphasize the interaction dimension and, specifically, the interaction between the user (teacher or learner) and the overall system, not only its content (the learning materials) which plays a crucial role in the fruition of the eLearning material.

Lanzilotti et al (2006) defines eLearning systems quality as “the extent with which technology, interaction, content and offered services comply with expectations of learners and teachers by allowing them to learn/teach with satisfaction”.

Important factors such as institutional factors, pedagogical, cultural, student and lecturer factors which are essential in developing successful eLearning are not considerd in this model.

2.7.9 E-Learning Quality (ELQ) by Högskoleverket (2008)

The Swedish National Agency for Higher Education (Högskoleverket) (2008) developed a holistic process eLearning quality (ELQ) framework for accreditation of distance education institutions. This framework is based on analysis of European policy documents, networks and quality projects and practices in addition to the current research on quality in the field of eLearning between the years from 2002 to 2007. ELQ model is based on 10 set of quality aspects. These aspects are:

- Material / Content. The main quality issues are selection and sequencing of material, and the quality of the material used and produced on a course.
- Structure /Virtual environment. This factor includes easy and structured ways of finding information and of communicating from a pedagogical view. The technical infrastructure must be robust, reliable, accessible and user-friendly
- Communication, cooperation and interactivity. Emphasis in on defining communication strategy based on pedagogical view to enhance eLearning.
- Student assessment. This includes the existence of different assessment methods such as simulation, seminars, and group work.
- Flexibility and adaptability. Flexibility in time, open course, study pace, flexibility of content and tasks, flexibility of location, flexibility of study method and ability to adapt to people with special needs.
- Support (student and staff). Support issues in eLearning includes: faculty support for students; social support for students; support from employers; support for faculty.
- Staff Qualification. Factors include awareness of technology, expectations and building evaluations.
- Vision and institutional leadership. Forming direct relationship between teacher and learner to funding allocation, strategy and planning. Aligning vision strategies to eLearning
- Resource allocation. In eLearning, resources have to be reallocated from physical locations (lecture halls, libraries, administration offices) to technical infrastructures, support organizations and staff development.
- Process aspect. This implies that the above nine categories should be seen as a whole and neglecting any one affect the overall quality.

Each quality aspect in the model consists of 3 to 4 quality criteria. These criteria are recommendations for concrete measures for dealing with the problems and issues identified at an institutional level.

This model emphasizes the pedagogical aspects in assessing the eLearning quality in every category of the model. Moreover, quality criteria in each category are emphasized by the existence of developing a quality strategy and implementing that strategy in each category.

2.7.10 A Layers-of-Quality Model in Online Course Design: The Five-E Model by Suzuki and Tada (2009)

Suzuki and Tada in (2009) proposed a quality model for the online course design composed of five layers. This model was first proposed by Suzuki in 2006 (Suzuki & Keller, 2007 as cited in Suzuki & Tada, 2009). The model is based on different instructional design models in a hierarchical way aiming to improve and enhance quality of various aspects of eLearning. The model is based on pedagogy and Instructional design models in every layer of the model. The Five-E quality model consists of five layers:

Layer 1: Ecological eLearning. This layer is about the proper infrastructure of the eLearning environment to avoid interruption and lack of access to contents. Criteria includes: Access environment, Adequate network speed, Substitute alternatives for different IT environment, Stability of service, Feeling of security

Layer 2: Exact eLearning. This layer is concerned about the needs analysis, task analysis and content analysis before starting to build the eLearning contents. Criteria includes: Content accuracy, Validity of Learning, Scope, Validity of interpretation, Indication, Rational and reliable, Intellectual Property Handling.

Layer 3: Easy eLearning. This layer is concerned with how easy to use eLearning by making it more usable and user friendly. Criteria includes: Content accuracy, Validity of Learning Scope, Validity of interpretation, Indication of equivocality, Freshness of Information, Rational and reliable, Intellectual Property Handling. ID techniques used may be: Technical writing, Rapid prototyping, or Formative evaluation.

Layer 4: Effective eLearning. This layer is about how to design eLearning environment to make learning more effective by taking into account learner characteristics and learning goals. Designing a learning environment that maches the objectives, learning support matching learner needs, interaction effects of collaborative members, self-regulated learning, and responsive environment. This can be done by implementing ID techniques such as Nine Events of Instruction, Structuring & Sequencing, First Principles of ID

Layer 5: Engaging eLearning. This layer is about keeping learner motivated and engaged in learning. Motivational design by applying different ID model such ARCS model, Andragogy, Aesthetic design, or serious games.

This quality model is stressing the pedagogy and instructional design theories in the eLearning by applying different theories to the design stages. However, factors such as institutional, support, instructor requirements are not included in it.

2.7.11 Process-Oriented Lifecycle QA Model for eLearning by Abdous (2009)

Abdous (2009) proposed a process oriented lifecycle quality assurance model in eLearning development and delivery. Quality assurance is embedded in the planning, analysis, design, production and delivery of eLearning courses at every stage of the process. This model is structured around three non-structured phases, which include:

- Before eLearning: planning and analysis. In this phase project plan and workflow diagrams are used to guide the development process.
- During eLearning: design, prototype and production. This phase is used to ensure the appropriateness, comprehensiveness and consistency of the contents to produce effective learning.
- After learning: post-production and delivery. During this phase interface usability and student feedback surveys are administered and collected to improve course, quality of the course and its contents.

Abdous (2009) emphasizes the context in which eLearning courses are being developed. Moreover, the success of QA also depends on external conditions, such conditions are: computer literacy of both the students and the academic staff.

2.7.12 Analysis of eLearning Quality Approaches

In this section a comparison between the previously introduced eLearning quality approaches will be presented.

A summary of the previously discussed eLearning quality approaches and models is presented in Table 2-7. These approaches cover different aspects and perspectives for the quality of eLearning and investigated narrowly, dealing with specific aspects of quality in eLearning. Most of the quality approaches are concentrated on the output and learning outcomes, while others concentrates on technology and access specially those developed early before the year 2005.

Most of the quality approaches focuses on development and design to ensure quality of eLearning. These quality approaches are approaching eLearning quality from a process-oriented or product-oriented point of view and trying to enhance the effectiveness and efficiency of eLearning. Some analyzed studies focused on the method (subject) of quality (process-oriented or product-oriented) such as:

- Quality on the Line by IHEP (2000) is a product-oriented benchmark focuses on the design of eLearning to ensure quality and excellence.
- ELearning success model by Holsapple and Lee-Post (2006) is a process-oriented model from information systems perspective.
- ELearning quality (ELQ) by Högskoleverket (2008) is a process-oriented framework for accreditation of distance eLearning.
- Process-Oriented lifecycle QA model for eLearning by Abdous (2009) is a process-oriented quality assurance model for development and delivery of eLearning.

Other studies looked at the target group (learners, developers, managers / administrators, teacher / tutor, or contents), these includes:

- Model of subjective quality by Ehlers (2004) based on learners perspective.
- A holistic framework to eLearning accessibility by Klein et al (2004) focuses on accessibility of eLearning outcomes and putting learners in the center.

Yet, others looked on the criteria and or results such as:

- General criteria for learning environments (Infrastructure, design, methodology, motivation, learning material, assessments, and support)
  - DDLM by MacDonald et al (2001) is grounded on pedagogy and consumer demands theory (content, delivery and service).
  - Five Pillars of quality on line by SLOAN-C (2002) emphasizes teaching outcomes and continuous improving of quality.
  - The conceptual model by Klein et al (2006) is based on motivation theory and input-process-output theory (IPO) and emphasizes that course outcomes is a direct result of motivation.
  - A holistic approach to eLearning accessibility focuses on accessibility of eLearning outcomes and putting learners in the center (2 classification for this approach).
  - Framework for quality of eLearning systems by Lanzilotti et al (2006) is developed for the design and or evaluation of eLearning systems and emphasizes the interaction dimension.
  - A Layers-of-Quality model in online course design by Suzuki and Tada (2009) is based on instructional design theories to improve and enhance eLearning.

Moreover, these quality approaches while trying to produce successful and quality eLearning from different perspectives, objectives, pedagogical theories and learning theories have common quality factors between them. The common quality factors between them despite the different quality terms used are:

- Institutional commitment
- Technological
- Pedagogical
- Design (instructional design and interface design)
- Content
- Support
- Student characteristics
- Lecturer characteristics

The different objectives and goals of these eLearning quality approaches, different theories on which they where based makes it difficult to generalize how they where developed.

Looking at quality approaches discussed in different sections of this chapter makes it difficult to have a complete view of how to develop a complete holistic model for eLearning that enhance and assure quality in the eLearning field. Developing a holistic and comprehensive model for building successful quality eLearning model from different

views is still a need. Drawing upon the discussions described above, a holistic hybrid quality model will be proposed. A complete description of the development process and the description of this model will be presented in more detail in chapter three.

Table 2-7 : Summary of different eLearning quality approaches proposed by different authors.

Model Name and author(s)	Quality dimensions	Description
Quality on the Line By IHEP (2000)	Institutional Support	Functional-oriented seven benchmarks for ensuring quality and excellence in online education programs. Focuses on the design issues.
	Course Development	
	Teaching Learning Process	
	Course Structure	
	Student Support	
	Faculty Support	
	Evaluation and Assessment	
DDLM by MacDonald et al (2001)	Superior structure	To develop a model to guide the design that meets the needs, interests of adults. Based on consumer demands (contents, delivery and services) grounded on pedagogy.
	Consumer demands (Content, Delivery and services)	
	Learner outcomes	
	Ongoing DDLM evaluation	
	Continual adaptation and improvement	
Five Pillars of Quality Online Education by SLOAN-C (2002)	Learning Effectiveness	Guides the process of measuring and continuous improving quality online teaching outcomes.
	Student Satisfaction	
	Faculty Satisfaction	
	Scale	
	Access	
Model of Subjective Quality by Ehlers (2004)	Tutor Support	Seven quality fields based on learners perspective from pedagogical point of view
	Cooperation and Communication in the Course	
	Technology	
	Costs-Expectations-Benefits	
	Information Transparency of Provider/Course	
	Course structure	
	Didactics	
A holistic approach to eLearning accessibility by Kelly et al (2004)	Usability	This model emphasizes the accessibility of eLearning outcomes and putting the learner center in the center from pedagogical view point.
	Local Factors	
	Infrastructure	
	Learning Outcomes	
	Accessibility	
The ELearning Success Model by Holsapple and Lee-Post (2006)	System Design (System quality, Information quality and Service quality)	A process oriented approach from IS perspective and system development phases.
	System Delivery (quality of Use and User satisfaction)	
	System Outcome (quality of net benefits)	

Model Name and author(s)	Quality dimensions	Description
The Conceptual Model by Klein, Noe and Wang (2006)	Learner characteristics (Learning goal orientation)	This model is based on IPO model and motivation theory. Course outcomes are a direct result of motivation to learn
	Perceived barriers / enables	
	Instructional characteristics (Deliver mode f2f or blended)	
Framework for quality of eLearning systems by Lanzilotti et al (2006)	Technology	This model is developed for the design or evaluation of eLearning systems emphasizing the interaction dimension
	Interaction	
	Content	
	Services	
ELearning Quality (ELQ) by Högskoleverket (2008)	Material / Content	A process-oriented eLearning framework for accreditation of distance eLearning.
	Structure / Virtual environment	
	Communication, cooperation and interactivity	
	Student assessment	
	Flexibility and adaptability	
	Support (student and staff)	
	Staff Qualification	
	Vision and institutional leadership	
	Resource allocation	
	Process aspect	
A Layers-of-Quality Model in Online Course Design by Suzuki and Tada (2009)	Ecological eLearning (Environmental Design)	A quality model for online course design based on instructional design theories to improve and enhance eLearning.
	Exact eLearning Content Design)	
	Easy eLearning (Information Design)	
	Effective eLearning (Learning Design)	
	Engaging eLearning (Motivation Design)	
Process-Oriented Lifecycle QA Model for eLearning by Abdous (2009)	Before eLearning: planning and analysis	A process-oriented lifecycle quality assurance model in the development and delivery of eLearning
	During eLearning: design, prototype and production	
	After eLearning: post-production and delivery	

2.8 Chapter Summary

Palestinian higher education institutions are implementing and developing eLearning initiatives to support the learning and teaching process in their curriculum. These initiatives are facing some difficulties such as fast accessibility, cheap, and lack of quality

There have been numerous definitions proposed for the term eLearning most of them have been associated with the art and science of education, applying computers, telecommunication, and information technology to enhance the method of instruction to finally enhance effective learning. ELearning has certain benefits compared to traditional classroom teaching: self-paced, early updates, consistency, encourage independent learning, increased participation & provision of content.

To define quality correctly, it is important to study its meaning in the field under study and in other fields related to studied field. What is quality in general and in production is defined; definition of quality in software, quality in higher education and then quality in eLearning is defined. This helps in understanding the different meaning of quality and its dimensions in the eLearning field and the field that surrounds it. As explained, quality should be seen from different dimensions and different perspective to produce quality eLearning. In the area of higher education and eLearning the concepts of what constitutes quality is still developing and keep on emerging because the education environment is dynamic.

A comparison between software quality models was discussed to find out how can we build quality models with the aim of finding the most important quality factors, criteria and metrics to be included in the developed hybrid quality model for eLearning.

Successful eLearning must be based on asset of critical success factors. These factors should consider the ones discussed in the literature and the trend and challenges of eLearning in the current and future of eLearning.

Quality management approaches in these days emphasizes the service and eLearning sectors in addition to the traditional production sector. These approaches emphasize the leadership, user-oriented, customer focus with continuous enhancement and development of quality in the intended field. Quality models in eLearning field have produced a common quality factors even though they are based on different quality meaning and perspectives. A number of factors contribute to the development of a good quality eLearning.

Based on the literature review done in this chapter and the context of this study, we have developed a holistic hybrid quality eLearning model for developing quality eLearning in the higher education sector to enhance the efficiency and effectiveness of learning. This model combines the properties of software quality model, quality management approaches, quality approaches in eLearning, with the critical success factor for developing successful eLearning with aim of designing, developing eLearning.

CHAPTER THREE

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3 A HYBRID QUALITY MODEL FOR ELEARNING (ELQM)

3.1 Introduction

The growing demand to provide quality eLearning in the higher education resulted in proposing different quality models, frameworks, benchmarks and best practices. These quality models consider the eLearning quality from specific quality factors such as: institutional, pedagogical, technical, managerial, stakeholders' point of view. It can be claimed that these models are not appropriate for the eLearning quality because they are considering eLearning quality from specific view points and not from a holistic view.

Taking into account the advantages and disadvantages of the quality models/frameworks reviewed in chapter two, a holistic quality eLearning model (eLQM) is proposed. Accordingly, the method used to develop eLQM and a complete description is presented in this chapter.

3.2 Developing eLearning Quality Model

There is no general framework for quality management, quality assurance, or quality assessment in the field of ELearning (Pawlowski, 2003b). Finding a suitable framework for HEIs in the field of eLearning, which leads to the development of a common quality framework that satisfies all stakeholders, is challenging (Hildebrandt & Teschler, 2004b). At the same time raises many questions such as: Which quality approach is appropriate for an organization in a specific context? How do quality approaches have to be developed to take into account specific needs and requirements (e.g. national laws, learning habits, learning culture)? (CEN/ISSS, 2006). This list shows that a decision-making process for quality approaches is a complex matter.

A quality approach is a process which aims at taking into account the "customer" needs (Chua, 2004; Auzende, Joab & Legrand, 2008). It aims a continuous improvement rather than a limited measure of a gap between observed and wished state. Each process (or sub-process) is specified by activities which transform input elements into output elements

(products or services). These activities make use of resources (human resources, equipment, methods etc., cause costs and known risks.

Quality approaches in eLearning (such as quality management, best and good practice and benchmarking, certification and accreditation systems, and quality competition and awards) (Srikanthan & Dalrymple, 2002; Rekkedal, 2006) resulted in the development of a great number of different quality management and quality assurance and quality improvement (Hildebrandt & Teschler, 2004b) that makes it difficult to choose the appropriate approach (Husson, 2004a). These approaches describe quality of eLearning from different interpretations, aspects, perspectives and purposes.

Quality approaches in the field of eLearning must consider the whole framework in which it takes place, to be really effective done (Ghislandi, n.d.). Also pedagogical, organizational, and technological dimensions should be considered. Quality approaches have to satisfy the different views of quality and the learning, education and teaching processes, learning content, and learning results (Schreurs, 2006). First the learning process, including the organization of the learning process, the pedagogical and technical support for eLearning. Second the learning content including equipment and facilities and third the learning results. Lastly the learning results should be efficient, effective and satisfies learners' needs and styles. Quality criteria have to be defined for those three areas.

There are several factors, as we have said, to consider while approaching eLearning quality. The different meaning of quality and the dynamic nature of eLearning results in a huge number of quality approaches. The existence of many quality approaches for eLearning and makes it difficult to compare and analyze these quality approaches to assure, improve, and enhance eLearning quality.

Developing the right suitable quality approach for eLearning is not only a matter of finding a suitable approach (Ehlers & Pawlowski, 2004) but requires a systemic analysis of a set of references to find the right criteria (Husson, 2004b). It also means that quality objectives are implemented for the core processes in the field of eLearning (Pawlowski, 2006) such as analyzing learner needs, design of learning systems, providing tutor support, performing assessments (ISO/IEC 19796-1, 2006) to enhance the learning process. The processes are those defined in ADDIE model or ISO/IEC 19796-1. Quality in eLearning can not be assured or enhanced from a product view (e.g. course, delivery, etc.) (Deepwell, 2007) only, but depends on an appropriate implementation of process: staff trainings, adults training, organizational and alike. However, the effective implementation of eLearning requires an evaluation of the CSF (Sridharan, Deng, & Corbitt, 2004). Because what we need to know is what makes it good and how we can make it better (Swan, 2003)?

Developing or improving quality approach in eLearning can be done (Srikanthan & Dalrymple, 2002) in one of two ways: synthesis of features from different available quality models to develop a generic model addressing educational processes, or develop a composite model by combining TQM model with the educational one. Such a synthesis, when appropriately implemented, would then results in a holistic cohesive framework model for quality management in eLearning for HEIs (Suzuki & Keller, 2007; Suzuki & Tada, 2009).

Srikanthan and Dalrymple (2002) also stated that, to develop a holistic model for quality management for higher education we need to distinguish between two types of processes:

- Services offered to students from academic and general administrative functions
- Teaching and learning functions (relating to education and research)

After a carefully analysis of methods and tools available in literature, we propose "A Hybrid eLearning Quality Model" (eLQM). eLQM is a holistic hybrid quality model for the design and development processes of eLearning that integrates characteristics of different fields. These include: Software quality models methodology, quality management approaches and characteristics are combined with instructional design strategies based learning theories to produce the eLQM. Moreover the process-oriented and product-oriented views are also integrated through the development process.

Software quality models hierarchy and decomposition of quality goals into factors, criteria, and metrics method is used in this quality models. The factors such as reliability, efficiency, usability, portability, functionality and maintainability which are used in most software quality models discussed in this thesis are used. These factors are interdependent and interact with each others to produce successful and quality eLearning.

Quality management characteristics which are found in most of quality management systems and TQM such as: leadership, people, processes, and customer results are also used in this model. One of the most important is service / customer oriented and continuous development and improvement of quality in maintained in the model.

Process-oriented and product-oriented approached are combined in the eLQM. The model should be grounded on pedagogical, educational and engineering considerations (Hadjerrouit, 2007). Process-oriented emphasizes the process of project management processes (activities to mange development process) and development processes (activities to produce eLearning). During the development process requirements (such as teachers' requirements, students' requirements, pedagogical requirements, technological requirements, and institutional requirements) must be defined precisely.

Product oriented which implies the definition and specifications of operations needed from the eLearning to its users which include: learning operations, teaching operations, institutional operations and learners operations. Learning operations include student login, downloading contents, participate in discussions, collaborations, learning activities, etc.

Table 3-1 show a comparison of eLQM and eLearning quality models / approaches reviewed and discussed in chapter two, section 2.7.

Table 3-1: Comparison between eLQM and other quality models

General Information	Developer(s)	IHEP 2000	MacDonald 2001	SLOAN-C 2002	Ehlers 2004	Kelly 2004	Holsapple 2006	Klein 2006	Lanzilloti 2006	SNAHE 2008	Suzuki 2009	Abdous 2009	eLQM 2011
Target		Higher Ed.	Developer Learner Academic	Higher Ed. Learner	Learner	Learner Developer	Learner Developer	Learner		Developer Higher Ed.		Developer Trainer Provider	L,D,HE
Production													
Process	Analysis										Layer 2:√	Before	ID&I
	Design				√		√		√		Layer 2:√	During	ID&I
	Development										√	During	ID&I
	Implementation						√					After	ID&I
	Evaluation	√	√	√					√				
Product	Institutional	√		Support						√			√
	Pedagogical	√	√		√	√					Layer 4,5		√
	Technological		Infrastructure		√	Infrastructure			√	Infrastructure	Layer 1:Infra		√
	Student			Satisfaction				√	Assessment	Assessment			√
	Cultural												√
	Support	√								√			√
	Instructors	Faculty		Faculty	√					√			√
	Content	√	Content		√ Partially				√	√			√
	ID & Interface		√				Interface		Interface		Layer5		√
	Delivery		Delivery				√	√			Layer 3		√
	Others	Learning processes	Service	Scale	Didactic	Outcome	Outcome	Outcome	Interact	Resource	Engage		√
Goals	Usability					√					Usable		√
	Accessibility					√				Communication			
	Design	Course								Flexibility			
	Others		Motivation	Effectiveness Accuracy	Cooperation			Motivation	Service	Environment			√
Method	Focus	Product	Product	Product	Learner		Process	Product		Process	Process, Product	Process	Process & Product
	Name	Benchmark	Benchmark & Quality model	Quality model	Quality model	Quality Assurance	Criteria & Quality model	Quality model	Quality model	Quality model	Quality model	Quality model	Benchmark & Quality model

Note: Layer 1: Ecological eLearning, Layer 2: Exact eLearning, Layer 3: Easy eLearning, Layer4: Effective eLearning, Layer 5: Easy eLearning

3.3 The Proposed Hybrid Quality Model for eLearning eLQM

eLQM is an eLearning quality model aims to manage and enhance eLearning in higher education institutions. The main objective of the proposed quality model is to improve, enhance, and assure the quality of processes, products, and services of learning, education and training in the higher education.

The proposed hybrid quality mode for eLearning (eLQM) is considered as a model that improves, enhance, and assure the quality of processes, products, and services of HEI that produces and offers eLearning. The eLQM is a holistic eLearning quality model grounded on existing literature as a base, incorporating concepts from information systems, education disciplines and total quality management, process-orientation and product-orientation

The model contains 97 criteria, and these are grouped into 49 sub-factors, and these 49 sub-factors are divided into ten main factors i.e. Institutional Factor, Pedagogical Factor, Technological Factors, Student Support, Instructor factors, Support Factors, Cultural Factors, Content Factors, Instructional Design Factor, and Delivery Factor. Figure 3-1 represents the eLQM with its main factors and sub factors.

The decomposition of the proposed model to characteristics, sub characteristics, and items is to make more control over the complete model and to identify the main issues that should be addressed for the development of an eLearning quality model. Moreover this decomposition will help to create a clear picture of the different characteristics that influence the creation of a quality model.

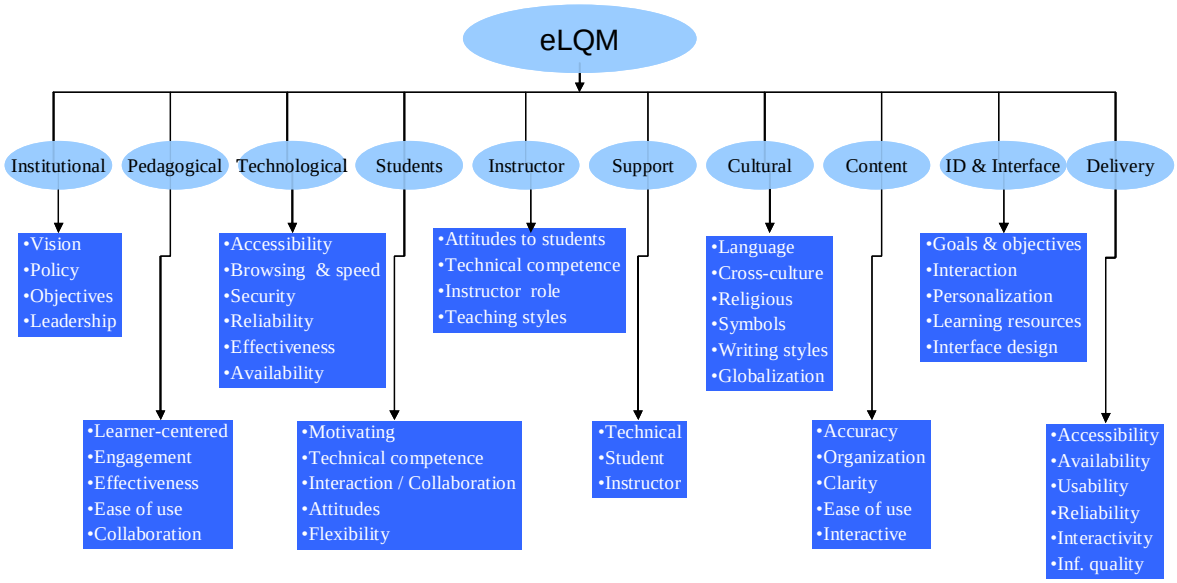

Figure 3-1: A Hybrid quality model for eLearning eLQM.

3.3.1 Institutional Factors

E-learning is a high priority for many institutions (Arabasz & Baker, 2003) in these days. To develop, implement and improve the quality of eLearning initiatives, it is very important to consider the institutional factors. This had been emphasized by many studies (Khan, 2001; Govindasamy, 2002; Frydenberg, 2002; McPherson & Nunes, 2006; Fresen, 2005; IHEP, 2000).

Institutional factor had been discussed frequently in the literature, but there is still no clear concept about it (Frydenberg, 2002). Alexander (2001) emphasizes the existence of a vision for eLearning, technology plan, and policies. According to Fresen (2005) this domain consists of technology plan, infrastructure, student consultation, institutional evaluation, organizational change and student selection. According to IHEP (2000) this domain includes: technological infrastructure issues, technology plan, and professional incentives for faculty. According to Khan (2005) this domain consists of needs assessment, financial readiness, infrastructure readiness, cultural readiness and content readiness. According to Masoumi (2010), institutional factors such as the management of students, programs and human resources, and technology are important for successful eLearning.

To provide quality eLearning anywhere at any time and to enhance the learning and teaching outcomes, higher education institutions should have good leadership, vision and mission, and strategic planning. Leadership addresses how leaders guide higher education institution in setting organizational values, directions, and performance expectations, how leaders communicate with employees, review organizational performance, and create an environment that encourages high performance. The main objective of management is to assure the existence of eLearning and technology plan and the delivery of this plan to all members to ensure its applicability and usage to develop quality and successful eLearning (Alexander, 2001). Lack of leadership can be considered one of the most important barriers to effective eLearning implementation (Thorpe, 2007:67) and results in poor policies and strategies to improve quality of HEIs.

The successful implementation of eLearning depends on explicit institutional visions and goals along with well-established procedures and standards (Marshall, 2006). A vision for quality eLearning in HEI must guide current practice and establish a common goal for the institution. This vision needs to be regularly updated and revised. It is important to begin eLearning project with setting the vision, e.g. to provide a quality eLearning courses for students who do not have the time because of work or family commitment to attend full time study. The strategic planning follows the vision, and addresses strategic and action planning, deployment of plans, and how accomplishments are measured and sustained. This should be based on learner needs. Omidi et al (2008) argues that organizations must understand the importance of eLearning and create appropriate strategies and approaches to benefit from ICT in education.

3.3.2 Pedagogical Factors

The pedagogical factor of E-learning refers to teaching and learning (Khan & Granato, 2008) in terms of how learning and teaching is carried out (Masoumi, 2010) using technology-based resources and tools (Anderson & McCormick, 2005). Successful implementations of quality eLearning environments must consider eLearning pedagogical factors to produce efficient and effective eLearning.

A successful eLearning system should not concentrate on transferring the content to learners (Govindasamy, 2002), but it should be concerned with the fundamental aspects of education, namely, learning (Pazos, 2002) and how to make the learning more effective and efficient. Addressing and understanding the pedagogical issues in the eLearning environment such as pedagogical principles, eLearning technologies, learning theories, learning communities, collaboration, interaction, socio-cultural is very important (IHEP, 2000; Khan, 2001; Fresen and Boyd, 2005; Govindasamy, 2002; Chin & Kon, 2003; DELPHI, 2005; Högskoleverket, 2008, Englbrecht, 2003). On the contrary, if pedagogical issues are not addressed well eLearning implementation may suffer success, quality and good learning processes. Therefore, it is important to consider and take into account the pedagogical issues while developing effective eLearning environment. These issues includes: engagement, learning environment (learner-centered), learning process (communication, collaboration, interactivity, etc.), and learning outcomes (effectiveness, ease of use).

Learning begins with engagement which leads to acquire knowledge and understanding aiming to understand things and practice them correctly (Alonso, López, Manrique & Viñes, 2005). Engagement is very important to enhance eLearning experience and ensure effective learning. To maintain and improve engagement during the learning process and ensure effective learning, various engagement techniques should be used. Engagement includes both participation (behavior) and involvement (attitude) and refers to the total set of user relationships towards IS and its development (Kappelman & McLean, 1991). To change the attitudes and behaviors of learners they should be fully engaged in the eLearning. Engagement of learners is done through interaction and motivational design such as using the ARCS (Attention, Relevance, Confidence, and Satisfaction) motivational model (Suzuki, 2009) which is based on the engagement of learners. The engagement of faculty and teaching staff is another critical factor for the effective implementation of eLearning. Staff engagement increases learner's interaction and effectiveness of eLearning (Srikanthan & Dalrymple, 2001).

Learner-centered focuses on learner's needs, abilities, interests and learning styles (http://en.wikipedia.org/wiki/Student-centred_learning) and learning environment to promote the highest levels of motivation, learning and achievement. Ehlers (2004) emphasized the learner-centered approach in developing quality eLearning and learners' quality is not only about instructional design or user interface (Ehlers, 2006). Learner's requirements should be taken into consideration to produce a high quality eLearning environment that makes them engaged and motivated to attain high results in their learning process. Learners may achieve higher academic results when they are given the opportunities to explore and learn based on their learning styles and preferences.

Communication possibility and sharing of information are the basic attributes of every eLearning system because they are key factors. Communication in the e-learning systems may be divided into the following two groups: synchronous and asynchronous. Synchronous communication is a real time event. It means that both participants have to be present in the same time. The quick response is advantage and problems may be discussed immediately. This form of communication is based on text, voice and audio-video transfers. Asynchronous communication is performed in different time. Due to this fact, participants may communicate in different time slices. The most general form of this type of communication is the e-mail. Interactivity describes the engagement of a learner in learning content through interactions with the content, peers and staff (Siragusa, 2005) to help in understanding the course or learning contents. Interaction is a central to eLearning (IHEP, 2000).

Increasing quality eLearning to enhance effectiveness, performance and productivity is of the most important issues in educational engineering and IS fields (Lee & Lee, 2008; Govindasamy, 2002; Siragusa, 2008; Anderson & McCormick, 2005). To produce effective eLearning, studying the process of how learners learn, interact and their attitudes towards eLearning is very important and critical issue (Liaw, 2008). To provide effective eLearning different principles may be used such as: different approaches to learning that satisfy and appropriate to personalize learning, providing characteristic of good learning (high order of thinking, collaboration) and so on.

Ease of use refers to the degree to which a student believes that the use of an eLearning system will be free of effort and easy to use and influence attitude towards using the technology. When user perceived the system to be easy to learn, or can be used with a little of guidance his attitude toward system adoption became more positive (Selim, 2005; Lim, Lee, & Nam, 2007). ELearning should be transparent in its ease of use by providing accessibility, ease to done with little guidance and effort from learner and with a proper ICT skills.

3.3.3 Technological Factors

Technology includes the hardware, software, and telecommunication devices (e.g. more servers, new learning management systems, etc.) needed to develop and run an eLearning environment (Alexander, 2001). To provide successful implementation of eLearning that supports effective learning, education, and training, quality of technology infrastructure should be very excellent. Use of information technology does not itself improve learning (Alexander, 2001) but it helps in adapting and using this technology to produce effective eLearning. Ehlers (2004) emphasizes the importance of technological requirements and stated that eLearning quality will decrease if these requirements are not satisfied. Also, technical requirements may be refined to more comprehensive procedures for the implementation of a quality eLearning material.

For eLearning to happen and be an effective system, a robust technical infrastructure must be in place to support the technical aspects necessary for the production, delivery of eLearning, and support (Mason, 2001). In this aspect the issues that need to be addressed when dealing with technology is the hardware and software used for building the

eLearning system. These issues includes: accessibility, reliability, availability, security, browsing and browsing speed, and effectiveness of technology (Khan, 2001; Ehlers, 2004; Fresen & Boyd, 2005; Lanzilotti et al, 2006; Selim, 2007; Sun et al., 2008).

Access refers to whether one has physical access to a computer and an Internet connection or not. Access to eLearning requires reliable bandwidth and high speed severs. Infrastructure need to be well managed and maintained to achieve high success. Also, accessibility to learning resources any time from anywhere is a basic.

Reliability of technology refers to capability of the system to perform without failure or with low error rate for infrastructure and software at the same time. Security and privacy of students should be granted and maintained.

3.3.4 Students Factors

Students or learners factors in eLearning environment are one of the most crucial factors for the success of any eLearning initiative. The importance of this factor leads many researchers to study the quality factors of eLearning from student's perspective (Ehlers, 2004; Selim, 2007; Menchaca & Bekele, 2008) as different learners have different perspectives and learning styles. Students are the main users and consumer of the eLearning and they are the main target of such system. Understanding their requirements and need is very important to succeed in developing, designing and implementing the eLearning that leads to student satisfaction.

Research showed that the most important factors related to students are:

- Student motivation
- Student technology competence
- Student interaction and collaboration
- Student attitudes towards eLearning
- Flexibility of eLearning
- Student learning styles

Motivation refers to the choices people make as to what experiences or goals they will approach or avoid, and the degree of effort they will exert in that respect (Keller, 1983; Klein, Noe, & Wang, 2006). Motivation reflects a desire to learn and use the acquired knowledge, skills and attitudes. Motivation is related with the three concepts effort, performance and consequences. Learner will be motivated if eLearning satisfies their need and make them achieve higher level of success. To keep learners motivated in the eLearning we have to maintain them interest (attention), relating course content to learner interest and needs (relevance), enhancing learner confidence in understanding course content (confidence) and encouraging learners' active involvement in learning (satisfaction). Motivated learners are able to engage in learning activities, have higher levels of self-efficacy, are willing to put in more effort, are more persistent, and use learning strategies more effectively.

Student technology competence includes criteria that make student feel that they have confidence in using the eLearning system such as: using computers, chatting, using emails, ad so on.

Collaboration focuses on social interactions (Ehlers, 2004) such as discussions, group interactions to create active knowledge. Student communicates with instructors and other student to build and expand their knowledge (Govindasamy, 2001). Social interaction between students and instructors as well as student-to-student enhances the quality of learning and sense of belonging to the learning community and competency, encouraging earlier completion of coursework, better performance on tests, and greater retention. This interaction can be chat rooms, discussion boards, instant messaging and e-mail all offer effective interaction for e-learners.

Student's attitudes towards eLearning are: Students' attitudes and behaviors' towards eLearning is a critical criterion for e-learning readiness and acceptance (Fresen, 2005; Selim, 2005; Siragusa, 2005).

Students learning styles are the ways in which learners prefer to learn and understand new things. Providing different teaching styles (instructional strategy) that support the learner's styles such as visual (learn by reading or observing), auditory (learn by hearing or listening), or kinesthetic (learn by doing) and preferences enhance, and improve learning outcomes. Flexibility in eLearning enables learners to choose when and how they learn. Most adult learners have no time to go to campus because of being busy or working.

Student satisfaction is that student feels that the eLearning is helpful in attaining their need requirements for the learning and teaching process. In general, student characteristics that could influence acceptance of eLearning includes: satisfactions with time and place flexibility of the system; students' involvement and participation; students' cognitive engagement; students' level of self confidence; students' technology self-efficacy; students' initiative and motivation and students' anxiety, prior knowledge, motivation to learn (Selim, 2005; Siragusa, 2005).

3.3.5 Teaching Staff / Instructor Factors

Instructor factors are crucial key to the success of eLearning (Volery & Lord, 200; Alexander, 2001; Frydenberg, 2002; Fresen, 2005; Selim 2007; Sun et al. 2008). Instructor factors that affect eLearning success include: attitudes towards students, instructor's technical competence, teaching styles, interaction (Volery & Lord, 2000; Andersson & Grönlund, 2009; Wilson, 2001), qualification and frequent feedback.

Instructor's attitudes towards student affect results of eLearning as instructor is a key factor in the learning process (sun et al, 2008). Also, instructors must take into account the different characteristics of learners; develop a pedagogy that suits their learning needs and willing to support learners to be successful. The learning process does not only depend on the instructor delivering the material to the trainee, there is also a social and collaborative

element where learners exchange ideas, share resources even help one another that is vital to the success of the process.

Instructor technical competence plays a key role in the effective delivery of eLearning initiatives. Instructors need to have computer skills to succeed in their eLearning experience, especially if instructors are also the content creators. Without these skills and software, it is not possible for them to succeed in the teaching style of eLearning. They need to be very comfortable using a computer. Instructors may play more than one role in the eLearning environment such as tutors and facilitators (Ehlers, 2004; Romiszowski, 2003). They require continuous updating, particularly on the use of technology, and therefore, continuous professional development online should be considered as a strategy to change their attitude towards eLearning. Instructors may be regarded as a major challenge in the adoption of eLearning initiatives.

Instructors should be aware of different learning styles and provides different teaching style suitable for all learners to enhance the eLearning experience. Instructor interaction with students in their learning process (Ozkan, & Koseler, 2009) is still predominant in eLearning environments. Instructor role such as facilitator or delegator should be considered as the teaching styles. Instructors' characteristics such as confidence, positive behaviors and facilitation could promote interactions and motivate students to learn in an eLearning environment (Salmon, 2000). Lecturers play a key role in the effective delivery of eLearning initiatives, as it is the lecturer not the technology that facilitates the students learning experience

To ensure the quality of eLearning, the qualification of the instructors should be also considered in terms of being well prepared, making the material more interest to learners knowledgeable about the topics presented in the course.

Instructor feedback to the learner encouraging students to become actively involve in eLearning. Instructor feedback intends to improve student performance via informing students how well they are doing and via directing students' learning efforts.

3.3.6 Support Factors

Support is a service provided for eLearning users to enhance and improve the effectiveness of the eLearning. From Information system point view it is a service support quality (DeLone & McLean, 2003). Service Quality refers to the quality of support services provided to the system's end users. Support system should prepare students, staff, and other users of the eLearning to be more effective and efficient. In addition to technical support, student support and staff/ faculty support are the major area for eLearning support system.

Technical support is an important factor in the acceptance of technology and user satisfaction (Batane, 2008; Arabasz & Baker, 2003; McGorry, 2003). A study by Alexander (2001) reported that access to technical support is essential for learners in achieving successful learning outcomes. For eLearning to happen students and instructors

must be able to use the hardware and software. As a result, training resources to ensure basic level of proficiency must exist (Arabasz & Baker, 2003). From total quality management (TQM) view point support is a service and the eLearning end users are the customers and most researchers on service quality use customer satisfaction as an indicator of quality. Common measurements of service quality are tangibles, reliability, responsiveness, assurance and empathy (Kettinger, and Lee, 1997; Parasuraman, 1988). In the eLearning context, Roca et al. (2006) assessed service quality by indicators related to responsiveness, reliability and empathy, and confirmed it's significant directly on satisfaction and indirectly on perceived usefulness. Also, technical support includes hardware needs, software needs, technical questions (Hitch & MacBrayne, 2003), help disks, online support services, remote control services (De Vries et al., 2005).

An effective learner support services system must be in place to help students in their eLearning to improve and enhance student outcomes (Rivers, 2005) and students' satisfaction which is very important for an eLearning system to be effective. Student support services includes: support before and during (Frydenberg, 2003). Also, access to learning resources, library, help desk, student handbook, advice and counseling is important.

Staff support may be regarded as a major challenge in the adoption of eLearning initiatives. Teachers need support from librarians and guidance counselors as well as from ICT consultants and administrators. The objective of all support services is to enable all academic members to contribute to eLearning development and not to be barriers. Staff support includes: technical, pedagogical and continuous training to support staff in implementing eLearning. Institutions should maintain a variety of training resources to ensure a basic level of proficiency and technical skills to handle the shifting need for advanced technical and pedagogical training (Arabasz & Baker, 2003) in the eLearning environment.

3.3.7 Cultural Factors

Learning is a social process which occurs in a cultural context (Gundry, 2001). Matsumoto (1996) defines culture as a "set of attitudes, values, beliefs, and behaviors shared by a group of people, but different for each individual, communicated from one generation to the next".

Developing quality eLearning environment requires the consideration of cultural factors to enhance user performance and satisfaction. Culture factors in eLearning should be designed to reflect the culture sensitivity as much as possible (Zaharias, 2008). ELearning needs to be designed to meet the individual needs, styles and preferences. Cultural factors could be a barrier to effective eLearning if not considered well during the design and implementation besides others factors (Collis, Parisi & Ligorio, 1996 as cited in Milani, 2008). Blanchard, Razaki and Frasson (2005) propose an eLearning system that must have the ability for cultural understanding (i.e. culturally interpreting a learner's behavior / feeling / result) and adaptation (i.e. displaying different interfaces and/or starting different learning strategies depending on learners' culture) from a usability view point.

Khan (2005) discussed cultural factors under the ethical dimension and stresses that interface design should be sensitive to cross-cultural communication and ethical issues. ELearning needs to be designed to meet the individual needs, styles and preferences. In our point of view cultural factures should be considered as a separate CSF because of its importance in learning and behavior. If contents in not developed based on culture different learners attending the same course may understand and interpret things differently.

Cultural factors can include aspects such as language, religious, symbols, writing styles, context (Mccombs & Vakili, 2005), multiple meaning of expressions (Barab et al., 2001). Failure to take these factors into account can compromise the success of in eLearning.

Language is a very important part of cultural identification (Rogers & Steinfatt, 1999) and the most part of nay culture (Hofstede, 2001). It represents a different way of thinking as well as a different way of speaking, and cognition is mediated and influenced by language (Gudykunst & Asante, 1989; Pincas, 2001). Also, most of the internet and eLearning is in English which counts as a barrier if learners do not know it. Language also influences and reinforces our cultural values and worldview.

To improve cross-cultural and diverse learners avoid using reduce or avoid the use of jargon, idioms, humor, acronyms, and ambiguous words (Khan, 2005).

Religious considerations should be taken into account while developing eLearning to different learners as it affects belief, thinking, and acting (such as separating gender is different class is Islamic countries).

To improve visual communication, navigational icons should be sensitive to learner's culture (Khan, 2005). Pointing hand icon violates a cultural taboo in certain African cultures by representing a dismembered body part. Also, a pointing finger that indicates a hyperlink is a problematic too. A right arrow for the next page may mean previous page for Arabic and Hebrew language speakers as they read from left to right (Reeves & Reeves in 1997 as cited in Khan, 2005).

Writing styles should be considered while developing and designing eLearning materials. Clyne's (1991 as cited in Kaments, 2005) studied the role of culture in discourse and found several areas of cultural differences in discourse structures and writing styles such as linearity vs. digressiveness, form orientation vs. content orientation, data integration, or the use of advance organizers. Localization is how the eLearning is adapted to fill local culture and language (Andersson & Grönlund, 2009).

3.3.8 Contents Factors

Contents aim to provide sufficient material to learners to meet the objectives of the eLearning course, and had been considered as a critical success factor by many researchers

and institutions (IHEP, 2000; MacDonald et al, 2000; Lanzilotti et al, 2006; Lim et al., 2007; Högskoleverket, 2008; Suzuki & Tada, 2009). ELearning contents in general consist of interlinked resources, which are a multimedia representation of the content, normally stored and run within a Learning Management Systems (LMS).

The development of quality eLearning content requires collaboration between different parties (Khan, 2005). These are teachers, content designers, subject experts and students. During the development phase content should be validated and produced in a modular way. Contents should be developed to be interactive to engage and motivate learners to interact with taking into account the learning styles of learners. The eLearning content should be developed based on instructional system design, learning theories and pedagogical principles. Applying technology with pedagogical concepts can create an effective student-centered environment and enhance learning outcomes (Govindasamy, 2002). They must include the following: the content, embedded exercises, FAQ's and Additional readings.

E-learning contents should be of high quality in terms of accuracy, organization, clarity, ease of use and interactivity (Selim, 2007) that are a prerequisite for a successful content development, delivery and management.

- Accuracy: E-Learning content should be accurate, up-to-date, sufficient, and free of errors and clear (Fresen, 2005; Holsaple & Lee-Post, 2006; Khan, 2005Selim, 2005). Learning resources should be reviewed, updated on continuous basis.
- Organization: E-Learning contents should be organized at an appropriate level of detail because learners place great importance on contents. Organization and presentation of contents should follow pedagogical factures (instructional model; structure; learner's control; accommodation of individual differences; cooperative learning) and design factors (interactivity; navigation; feedback; screen design) (Elissavet & Economides, 2003).
- Clarity: E-Learning contents should concise, written clearly to be understood and presented in a clear way.
- Ease-of-Use: E-Learning contents should be design in a way to be accessed and navigated easily. Contents should be more user friendly (Frydenger, 2002) and developed from a pedagogical view (Govindasamy, 2002) in a smaller manageable chunks known as learning objects (LO) to ensure re-usability.
- Interactivity: E-Learning contents should be interactive to help learner think about, understand and create meaning out of them, to develop new knowledge and skills, to practice on them. Content promote more interactive and effective learning (Englprecht, 2001).
- E-Learning contents should be motivational and engaging

3.3.9 Instructional Design Factors and Interface Design

Instructional design (ID) is defined as "A process involving the systematic development of instructional specifications using learning and instructional theory to enhance the quality of teaching and learning" (www.heacademy.ac.uk). Design and development of e-Learning,

consists of all the activities to enable learning to take place (Frydenberg, 2001). These activities are plans and procedures based on instructional design models and strategies to produce learning materials to facilitate learning and help acquiring new skills and knowledge.

In general the design should start from analysis by specifying the goals and objectives of the eLearning, designing instructions based on goals and objectives, developing instructional materials based on leaner-centered and interactive, implementing these instructions and evaluating effectiveness of instructions.

To achieve the design of quality eLearning based instructional design strategies to promote effective and efficient learning quality criteria includes: defining and clarifying objectives, interaction, personalization, learning resources and content organization, interface design, navigation and feedback are required.

Defining and clarifying objectives for effective eLearning is a crucial process for student achievements. Also, learning goals specify the learning activities, contents and how to assess them (Holsapple & Lee-Post, 2006; Khan, 2005).

Personalization of the eLearning environment should be designed to reflect learner's needs and expectations. Developing an eLearning to help learners to control the way they learn in respect to their needs, styles and preferences make the learning process more attractive and engagement to them. Learning scenario and styles should be selected in accordance with course objectives and goals (Holsapple & Lee-Post, 2006; Khan, 2005). Selecting a suitable pedagogical method to help learners achieve the learning goals will help in selecting proper design and learning activities

The system should be designed to be usable, user friendly (Suzuki & Tada, 2009) and provides satisfaction to its users in terms of interface (screen) design, interactivity navigation and feedback.

Interface design quality factors includes: interactivity, navigation and feedback. Interactivity in instruction comprises the nature of the activity performed by the technology and the learner, and to make that interaction more meaningful (Reigeluth, 1987). It is important to design as much meaningful interactivity as possible into instructional software. Good learner-interface interaction allows the learner to focus on learning and communication rather than how to access instructional content and communicate with others (Lohr, 2000).The interface design should be clean, functioning well and easy, the look & feel should be attractive to hold the attention of the learner.

The amount of navigational assistance needed is a function of the size of the knowledge base; the usefulness of navigational aids that are already part of the authoring software, and the types of links the software allows (Locatis, Letourneau & Banvard, 1989). Guidelines for increased interactivity were produced from researchers (Shneiderman & Kearsley,

1989; Tessmer, Jonassen & Caverly, 1989) and are used in the instrument as evaluation items in the relevant section.

Feedback is closely related with the issue of interaction, as action without feedback is completely unproductive for a learner. In computer-based instruction, however, the intrinsic feedback relates to navigation and interactivity with the instructional program, and the extrinsic feedback relates to the feedback on user's performance.

3.3.10 Delivery Factors

The process of delivery includes the final preparation and the actual running of the course. Delivery should ensure learning materials delivered to users in the most effective and efficient manner. A delivery system can take many formats, depending on methods and media that are used to present course materials. Identifying quality criteria for delivering eLearning content is very important to enhance the quality eLearning.

After designing developing and implementing the eLearning content it will be delivered to users to enable the learning and teaching to happen. Various approaches can be used to deliver learning contents such as synchronous mode, asynchronous mode or blended mode.

Synchronous delivery refers to real-time, instructor-led eLearning, where all learners receive information simultaneously and communicate directly with other learners. Examples include teleconferencing (audio, video, or both), Internet chat forums, and instant messaging. With asynchronous delivery, the transmission and receipt of information do not occur simultaneously. The instructor and learners communicate using e-mail or feedback technologies, but not in real time. A variety of methods can be used for asynchronous delivery, including email, online bulletin boards, newsgroups, and Weblogs. Blended delivery refers to a combination of face-to-face and online learning aiming to achieve a great sense of localness and enhance the traditional lecture with additional readings, electronic instructor notes and images of charts, graphs, or other handouts in one course (Hameed, Badii & Cullen, 2008).

Delivery of eLearning is done by eLearning platforms. ELearning platforms (sometimes called learning management systems (LMS), sometimes learning content management system (LCMS) are applications used for delivery of learning content and facilitation of learning process.

A quality delivery strategy involving issues associated with the ways in which the course is delivered to the learners: the learning material should be accessible and available to all learners. Additionally, reliability and usability of the technology: the eLearning system should allow learners to navigate and download materials within a reasonable period of time, and learners should be able to learn using the system easily, efficiently, without errors and be satisfied with it. Moreover, the system should be user friendly to its users while they are using it and allow them to concentrate on understanding the contents rather

that worrying on how to use it. Lastly, learners should be motivated to interact and communicate with the quality contents and the system in an efficient manner.

3.4 Conclusion

In this chapter, the proposed hybrid quality model for eLearning had been outlined and introduced. As seen, proposed quality model is build on the shoulders of the existing eLearning models / frameworks and emphasizing on the most important aspects and factors that had been discussed in the literature taking into account the trends and challenges identified by different research. eLQM is grounded on the integration of pedagogical and technological factors which both of them are changeable and an ongoing updatable of the model by reviewing the field of eLearning quality is needed.

The eLQM is developed with the hope to achieve quality and success while developing and implementing eLearning environment in higher education institutions to enhance the quality of eLearning. Successful implementation can be achieved by considering stakeholders' needs, concerns, and requirement. Quality can be achieved by applying quality to processes-oriented approach for the developing of eLearning environment and applying product oriented functions.

eLQM improves and enhances quality through its design which is based on process-oriented approach. It also, identifies quality factors and criteria to be used to measure the effectiveness of the developed eLearning environment. Quality assurance in eLQM can be insured through continuous evaluation and updating of institutional strategies, pedagogy used, and updating technology strategies because technology changes rapidly in these days.

To summarize, the model can be useful to those who develop, design and distribute eLearning by providing the necessary critical success factors for eLearning and the quality factors and criteria to build quality eLearning environment based on different strategies and methodologies which are based on pedagogical and learning theories.

Finally, this model should be seen and considered as a whole not in separated parts. Failing to consider any part may affect the whole quality of the produced eLearning environment.

CHAPTER FOUR

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4 METHODOLOGY

This chapter provides detailed description and discusses the methodology used in this thesis to address the research questions identified in chapter one of this thesis. Section 4.1, presents a brief introduction to thesis objective. Section 4.2, presents and describes research methods and methodologies. Section 4.3, describes research methodology used in this thesis. Section 4.4, describes data collection methods used in gathering the information necessary for this thesis. Section 4.5, describes data analysis. Finally, section 4.6, summarizes this chapter.

4.1 Introduction

The main objective of this thesis is to develop a quality model for eLearning in higher education institutions. Previous chapters introduced the literature review, identifying the critical success factors, quality models, eLearning quality models proposed by different authors and proposing the quality model for eLearning eLQM.

The importance of developing quality eLearning in higher education institutions is highlighted and emphasized in the literature. Hence, any quality model to be developed must be rooted upon what makes eLearning successful taking into account the different stakeholders' view. At the same time quality in higher education must be seen from different perspective and definitions. Taking into account these issues the proposed hybrid quality model for eLearning (eLQM) can ensure the success and quality of developed eLearning environment and contents to provide an enhanced and effective eLearning.

Based on the research objectives, the following research questions were developed to reach the main objective of this thesis:

- What are the critical success factors for eLearning in higher education institutions?
- How to manage and enhance quality of eLearning in higher education?
- What are the recommendations in implementing quality in eLearning?

4.2 Research Methodology

Research is the systematic process of collecting and analyzing information to increase our understanding of the phenomenon under study.

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered yet. Research study has its own specific purpose, research objectives may be grouped into four categories:

- Exploratory research. Aims to gain familiarity with a phenomenon.
- Descriptive research. Aims to portray accurately the characteristics of a particular individual, situation or a group.
- Diagnostic research. To determine the frequency with which something occurs or with which it is associated with something.
- Hypothesis testing. Aims to test a hypothesis of a causal relationship between variables.

Research methodology defines the research activities, how it process, how to measure the progress of research activities by adopting this or that methodology, which can lead to achieve the author objectives. Research approaches may be quantitative, qualitative or Mixed method (Creswell, 2003).

The quantitative method is a method where the researcher studies the phenomena in an objective way, tests the proposed theory and hypothesis, also identify the statistical relationship when analyzing the data. A quantitative study include: observations, experiment, questionnaires or source analysis. (Holme & Solvang, 1997).

The qualitative method is used to explain subjects that are vague, have a number of different meanings and are subjective (Wallén, 1996). Also, qualitative studies are tools used in understanding and describing the world of human experience.

Mixed method is combination of quantitative and qualitative methods. Mixed research uses both deductive and inductive methods, obtains both quantitative and qualitative data, attempts to corroborate and complement findings, and takes a balanced approach to research. Mixed Methods approach, is an approach in which use both quantitative and qualitative approach for generalization and detailed view of the meaning of phenomenon or concept under investigation.

This research study used a mixed research methodology to achieve the intended goals and objectives. Figure 4-1 illustrates the research and development process used in this thesis. Mixed methods provide better understanding than single methodology. The mixed method combines quantitative and qualitative methods. Qualitative method, in view of exploratory is used to understand the related terms and human attitudes to learning and opinions. Also, it includes a literature review that explores, analyze and synthesize the CSF for quality eLearning model.

Firstly, the researcher conducted a literature review of eLearning and related terms to extract and summarize the latest research on quality in eLearning. This research includes:

- Reviewing current literature and research on terms related to quality, software quality, quality in higher education and quality in eLearning, with a focus on identifying critical success factors to build a quality model for eLearning.
- Based on the reviewed literature a set of CSF was synthesized
- Reviewing current literature on quality management approaches in different fields, to understand how to build quality model in eLearning.
- Based on the above an eLearning quality model was proposed
- Then the literature is revisited to create and generalize guiding principles and quality criteria for each critical success factor.

The purpose of this stage is to acquire the necessary knowledge and to get know the available data and materials about the eLearning, quality in different situations, the related terms to thesis subject and to formulate the research problem in a meaning context.

Secondly, the data is collected in both a quantitative and a qualitative way. A research instrument (survey) was designed as a data collection method to gather information about research questions. The main purpose of the questionnaire is to validate the proposed quality model. Also, the questionnaire measures the importance on these factors in developing a quality model for eLearning sessions or initiatives to help decisions makers on how to implement a successful and quality eLearning in heiS.

Thirdly, the findings from analyzing of collected data will be used to validate the proposed quality model for enhancement purposes to reflect the perspectives of the honorable stakeholders' views.

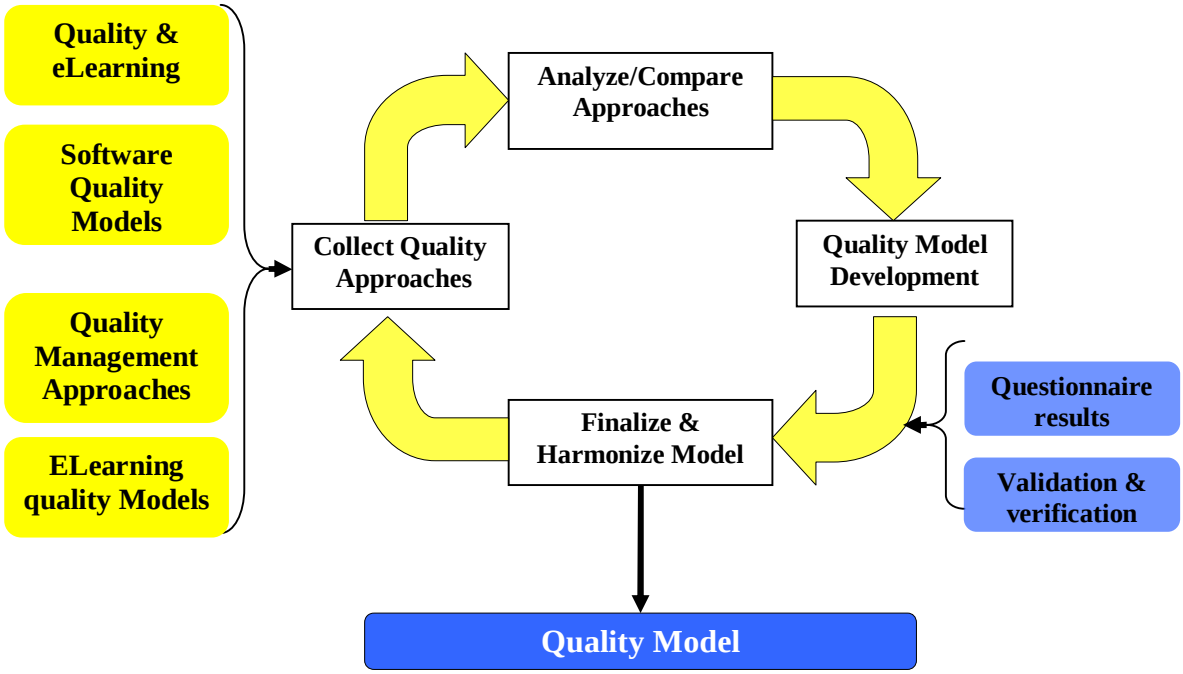

Figure 4-1: eLQM research and development process

4.3 Data Collection Method

There are several methods for collecting and studying data. When collecting data the researcher could choose to collect primary or secondary data. Interviews, questionnaires and observations on the other hand are seen as primary data. Primary data means that the data only is gathered with the purpose of this specific study. Secondary data is gathered from literature studies, presentations; (lectures, conferences, and seminars). This means that the information is developed by another researcher for another purpose than the current study, (Björklund and Paulsson, 2003).

Two types of data were used: the primary and the secondary data. The primary data were derived from the answers respondents gave in the self-administered questionnaire prepared by the researcher (explained in next sub section). The secondary data on the other hand, were derived from the findings stated in published documents and literatures related to the research problem. These were based from the recent literatures related to quality and eLearning and the factors that challenge.

4.3.1 Research Instrument

Questionnaires are, probably, the most commonly used investigation method according to Pfleeger and Kitchenham (2001). By using a questionnaire we are trying to obtain the people opinion about different aspects in order to evaluate each dimension of the quality. The objective of this questionnaire is to verify if the CSF developed for the proposed eLQM, which are mentioned in this thesis, could be recognized by the sample as being significant or not. In order to understand the perception of eLearning users a questionnaire was developed.

To develop the research instrument, the literature was reviewed for existing elements that could be used. An extensive literature review related to the quality issues in general and eLearning in particular have been accomplished. The items / elements used were carefully adapted and some items reworded from past research to be related to the quality context of eLearning. The instrument items for the part assessing quality factors were adapted from prior studies (Selim, 2005; Volery & Lord, 2000). Some items were developed by the author to complete specific needs.

Research instrument consists of almost closed-ended questions. The questions were structure using the Likert format. In this survey type, five choices are provided for every question or statement. The choices represent the degree of agreement each respondent has on the given question. The scale ranging from strongly disagrees (1) to strongly agree (5). Participants checked the place on the scale that best reflected their feelings about the item. The Likert survey was the selected questionnaire type as this enabled the respondents to answer the survey easily. In addition, this research instrument allowed the research to carry out the quantitative approach effectively with the use of statistics for data interpretation.

The research instrument contains a cover letter which explains the purpose and description of the study. The instrument consists of 106 questions divided into four parts, namely: the demographic part (5 items), eLearning status (3 items), quality factors (96 items) and the comment part (one item). The first part, demographic part consists of five questions that aim to collect data about the respondents' institution, educational level, gender, age, role, and educational level.

The second part assesses eLearning status in PHEIs eLearning stakeholders' perspectives. This part consists of three questions that assess the current learning and / or teaching supported by information technology, rating eLearning initiatives in respondent institution, and future trends of eLearning by respondents.

The third part of the questionnaire assesses quality factors identified by this thesis. This part consists of 96 questions and based on five-point Likert-type scale items, ranging from: strongly disagree, disagree, neutral, agree and strongly agree. These items are divided into main factors according to concepts addressed in the critical success factors. The factors are: (a) institutional factors, (b) pedagogical factors, (c) technological factors, (d) instructional design and design factors, (e) content factors, (f) cultural factors, (g) student factors, (h) instructor factors, (i) support factors, and (j) delivery factors. Each main factor is measured via a group of sub factors (items). The last part of the questionnaire is the comment and concerns. This part collects comments and concerns of respondents about eLearning in general.

The developed research instrument (Appendix 5.1) was translated into Arabic (Appendix 5.2). The purpose of translation into Arabic is to help respondents to choose the language they prefer to answer in. Then, the instrument was translated back into English to make sure that the translation was correct and the meaning remains the same without change.

In order to test the validity of the questionnaire used for the study, the researcher tested the questionnaire to five respondents. These respondents as well as their answers were not part of the actual study process and were only used for testing purposes. After the questions have been answered, the researcher asked the respondents for any suggestions or any necessary corrections to ensure further improvement and validity of the instrument. The researcher revised the survey questionnaire based on the suggestion of the respondents. The researcher then excluded irrelevant questions and changed vague or difficult terminologies into simpler ones in order to ensure comprehension.

4.4 Analysis Approach

After collecting all the data, the process of analysis begins. Data analysis is a way to describe, combine, and inference aims to draw conclusions about the collected data and information. Collected data were analyzed using:

- The scoring system (described below).
- Descriptive statistics based on mean, standard deviation, percentages, and frequencies.

- Correlation measures such as the Pearson product moment correlation and Spearman's rho were used to test the relationship between the respondents'.
- Factor analysis to find the significance contribution of each factor to total quality.

The analyzed data were presented in tables, figures, and narrative forms. The data obtained from the questionnaires were analyzed and presented using Statistical Package for Social Sciences (SPSS) version 17 and advanced Microsoft Excel.

Scoring system technique was used to compute the factors, were each factor represents the overall level of perception as one score from 1 - 5. This means that whenever the score is closest to 5 the respondent have positive attitude while if it is close to 1 then it means that the respondents have negative attitudes.

In data analysis for some indicators that use ordinal scale to be measured, we use a specialized scoring system out of 5 points to express the results of these indicators. Usually the score varies between 1 and 5 points. Then this scale is mapped into scores, (Table 4-1)

Table 4-1: Scoring system for

Scale	strongly disagree	Disagree	neutral	agree	strongly agree
Score	1	2	3	4	5

Once the results of this variable are transformed into the above system of scores, one can obtain the average evaluation for such indicators instead of obtaining the percentages of the various categories. Transforming these variables into scores and obtaining their averages instead of getting the percentage of their respective categories, is much better when conducting comparative analysis across various segments of the target audience. Therefore, if the average indicator among females' respondents is 3.8 points and 3.2 points the males' respondents, we can tell that the females' respondents are more positive than males' respondents. Therefore, the policy recommendation would be to pay more attention to the males respondents in regards to the area of interest. This scale was then grouped into four levels – low, satisfactory, good and high. Low ranges from 1.0 – 3.4, satisfactory ranges from 3.5 – 4.0, good from 4.1 – 4.4 and high ranges from 4.5 – 5.

4.5 Summary

This chapter outlined methods that were used to conduct this research study. The mixed method was used in this research to enhance and validate the developed quality model. A discussion of the population and the development of the research instrument together with the data collection methods used. Finally, the analysis approach that will be used in analyzing the collected data was introduced and highlighted.

Next Chapter, the research findings are presented in accordance with the methodology method presented in this chapter. The results are presented in sections based on the research questions.

CHAPTER FIVE

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5 DATA ANALYSIS

This chapter explains and presents in detail the results of data analysis. Data were collected and processed in response to the research questions posed in chapter one. It highlights the sample and data collection method, and data analysis which includes the sampling plan and data analysis method employed. Also, in this chapter the main findings of the data analysis are presented and highlighted.

5.1 Introduction

The increasing importance of quality in the field of eLearning, the lack of generally accepted quality model in the field, and increasing debate on quality in the field of eLearning etc. are the main drivers in the research of eLearning quality in higher educations. These critical issues drive the main goal of this research. The research main goal is to propose a quality model for managing and developing quality eLearning in PHEIs and to provide a set of critical success factors for building eLearning.

The main objective of this study is to enhance quality in eLearning through proposing a quality model for eLearning. The study mainly focuses on ten quality critical success factors. These factors are *Institutional Factor, Pedagogical Factor, Technological Factor, Student Support, Instructor factor, Support Factor, Cultural Factor Content Factor, Instructional Design Factor, and Delivery factor.*

The research and survey objectives are as listed below:

- To understand eLearning status in Palestinian higher education,
- To study eLearning stakeholders' profile,
- To better understand quality aspects in eLearning,
- To examine features that could promote quality and success in eLearning,
- To test the quality factors proposed for the quality model
- Identify significant and contribution of each quality factor in eLQM; and
- To develop a set of quality guidelines for eLearning.

5.2 Sample and Data Collection

The target sample in this study is some of the stakeholders (Students, faculty members, IT staff, etc.) of eLearning at Al-Quds Open University (QOU), Palestine Technical University (Khodori) (PTU), An-Najah National University (NNU), and Birzeit University (BZU) in the Palestinian Authorities. Therefore, questionnaires were distributed to different eLearning stakeholders in these universities, in attempt to discover their views and perspectives towards quality in eLearning. The sample was selected from computer or electronic engineering departments from second or third year students who at least had take one eLearning course. This selection is very important because we need familiar respondent with eLearning for the results to be more reliable and consistent.

The developed survey was organized over a five-week period in the fall semester of the year 2011, from September 10, 2011 to October 7, 2011, then one more week to October 13, 2011 to collect more responses. The researcher personally managed the questionnaire by visiting these universities. Respondents were requested and invited to participate in the survey.

A total of 410 questionnaires were delivered to respondents and a brief explanation of the purpose of the study was introduced. However, only 373 where returned and out of these only 338 where completely answered and accepted. Some returned questionnaires were rejected because they were partially filled, had many duplicate selections which make it difficult to determine the correct answers or the respondent followed a sequence in answering the questionnaire that makes it invalid. Demographic profile of the respondents based on the universities is shown in Table 5-1.

Overall response rate for this study is (valid / total distributed) 82.44%, which might be considered high, due to the effort done by the author to get the responses. Also, demonstrates the high level of interest on the subject as noticed during the survey collection period.

Table 5-1: Delivered and valid questionnaire statistics.

Code	Higher Education Institution name	Surveys distributed	Surveys returned	Surveys rejected	Valid	Valid %
QOU	Al-Quds Open University	130	116	4	112	33.14%
PTU	Palestine Technical University	140	130	25	105	31.07%
NNU	An-Najah National University	70	62	5	57	16.86%
BZU	Birzeit University	70	65	1	64	18.93%
Totals		410	373	35	338	100%

5.3 Validity and Reliability of the Questionnaire

According to Thuren (1991), **validity** determines whether the researcher truly measured what he or she intended to measure or how truthful the result of the research was. If the research was measured correctly then there is high reliability, but if the same research was irrelevant then the research lacks the validity.

The reliability of the instrument was assessed by means of the internal consistency (Cronbach's alpha). Internal consistency measures whether respondents are responding to different questions in a consistent manner or not. (Spiliotopoulou , 2009). Cronbach's alpha coefficient (α) which is greater than 0.7 is considered as acceptable in most social science research, although lower coefficient (greater than 0.6) may be considered as acceptable depending on research objectives.

The internal consistency reliability of the questionnaire was estimated by using Cronbach's alpha coefficient by correlating each item with all items included in the calculation except the first 8 items which are the demographic of the respondent, and the comments question are not included in the calculations. Composite Cronbach's alpha was 0.960. This was considered appropriate to precede further with the analysis as the Cronbach α (alpha) > 0.70 except for institutional factor (α =.666) which is considered acceptable. Table 5-2 shows Cronbach's alpha, mean, standard deviation for the main quality factors.

Table 5-2: Cronbach alpha, mean, standard deviation for main quality factors

	N	Mean	Std. Deviation	Cronbach's alpha
Institution	338	4.0525	.52490	.666
Student	338	3.7985	.80172	.871
Pedagogy	338	3.6658	.66275	.762
Culture	338	3.5325	.76891	.840
Instructional Design	338	3.4954	.62425	.835
Delivery	338	3.4049	.80005	.882
Instructor	338	3.3745	.85835	.883
Content	338	3.3330	.77712	.878
Support	338	3.2901	.80455	.866
Technology	338	3.2273	.82819	.808
Valid N	338			

5.4 Respondents' Profile

ELearning depends on the perspective of its users especially learners, instructor, and developers. Therefore, analyzing the results with respect to eLearning users is very important. In the following subsection an analysis of the respondents' profile will be presented.

5.4.1 Respondents' Demographics

Demographic data is very important for generalizations about groups of people, equity and diversity, establish baseline measures, compare to other communities, etc. This type of information is important for explaining variations in educational outcomes and behavioral patterns.

Respondents were asked to identify themselves based on five attributes: institution type, gender, age, primary role, and education level. Table 5-3 shows the summary on the respondent's demographic statistics on frequency and percentage.

To identify the institutions of the respondents, the first question asked the type of the institution respondent belongs to. Most of the respondents (324, 95.9%) belong to Universities, 10 respondents (3.0%) belong to colleges and only 4 respondents (1.2%) specified that they belong to other type as shown in Table 5-3. Institution type indicates that almost all students belong to university so findings from this study are all valid for universities.

As shown in Table 5-3, female respondents in this study (178, 52.7%)) is slightly higher than male gender with 160 (47.3%), indicating a good balance of gender in the sample. They were aged less than 25 years (297, 87.9%), from 25-34 years (27, 8%), between 35 and 44 (10, 3.0%). However, 3 (0.9%) respondents were aged between 45 and 54 years and only one (0.3%) more than 55 years. The difference in age is because most of the respondents were students. Older age was either instructor of clerks. Data on respondents' gender is critically important for examining issues of gender equity and bias conclusion. In this survey male and female are almost equal and hence data analysis or generalization is the same for both genders.

Quality of eLearning is always seen from the perspectives of its users. Therefore, the survey asked the respondent to identify their primary roles in relation to eLearning. Most of respondents describe their primary role as learners (students) (309, 91.4%), teachers (10, 3.0%). Other respondents describe their role as trainer / administrator (5, 1.5%), others (12, 3.6%), and developer (1, 0.3%). However, the 12 respondents (6, 2.2%) described their primary role as "others – please specify" were: two employees and one instructor, while the rest did not specify any thing. Since respondents like trainers, developers and others are very small they may be combined in one group as developers. They may play different roles during eLearning development process (tutor, content developer, etc.). Within this

view we may assume that this survey represents the perspectives of learner with very little view of developers. This implies that findings will almost fit to students view.

Responding to answering the educational level, most of respondents identify their educational level as bachelor degree (323, 95.6%), high school (35, 10.4%), master degree (9, 2.7%), college (25, 7.4%), Phd degree (3, 0.9%), and (3, 0.9%) with other degrees respectively (see Table 5-3).

The respondent population had a mean age of 1.18 years old (median 1, mode 1, range 4, inter-quantile 0, N= 338. Respondents' age is another important variable for explaining the structure and evolution of an education system, and for examining the educational development of students over time.

Table 5-3: Respondents demographic data

Profile		**Frequency**	**Percent**	**Valid Percent**	**Cumulative %**
Institution Type	University	324	95.9	95.9	95.9
	College	10	3.0	3.0	98.8
	Other	4	1.2	1.2	100.0
	Total	338	100.0	100.0	
Gender	Male	160	47.3	47.3	47.3
	Female	178	52.7	52.7	100.0
	Total	338	100.0	100.0	
Age	Less than 25	297	87.9	87.9	87.9
	between 24 and 34	27	8.0	8.0	95.9
	between 35 and 45	10	3.0	3.0	98.8
	between 45 and 54	3	0.9	0.9	99.7
	Older than 55	1	0.3	0.3	100.0
	Total	338	100.0	100.0	
Primary role	Learner	309	91.4	91.4	91.4
	Teacher/trainer	10	3.0	3.0	94.4
	Trainer / administrator	5	1.5	1.5	95.9
	Designer / developer	1	0.3	0.3	96.2
	Pedagogical expert	1	0.3	0.3	96.4
	Other - specify	12	3.6	3.6	100.0
	Total	338	100.0	100.0	
Educational level	High school	35	10.4	10.4	10.4
	College	25	7.4	7.7	17.8
	Bachelor	323	95.6	95.6	95.6
	Master	9	2.7	2.7	98.2
	PhD	3	0.9	0.9	99.1
	Other - specify	3	0.9	0.9	100.0
	Total	338	100.0	100.0	

5.4.2 Respondents' Comments

The last section of the survey asked respondents to write any comments or concerns regarding eLearning they may have. The percentage of respondent who answer this part of the questionnaire was 27.74% (76 respondents). After eliminating overlapped ones, answers were categorized and summarized as follow: advantages, disadvantages, availability, accessibility, technical, non technical, and length of the questionnaire. A range of comments and concerns from respondents and these are summarized as follow:

- There is a strong demand not to implement eLearning before doing good analysis and appropriate strategies on how to implement it. This may be seen as a message to policy makers to start implementing eLearning strategies for eLearning.
- There is a strong demand to improve contents by looking for the good and continuously updating of the contents. A message to content providers to start a strategy of good contents both in traditional and eLearning.
- There is a strong demand to develop skills to start using eLearning. Because some of the respondents complains from not having good command on using eLearning or even computers. A message to policy makers to start strategies to concentrate on providing good support to teach and learn all students on how to use computers.
- There is a concern about not having computers or the difficulty of accessing computer is the campus to access internet. A message to managers to have a good infrastructure policy in universities to provide the necessary equipments and computers to all students.
- There are concerns about barriers (obstacles) of using eLearning such as speed, infrastructure. A message to managers to have a good infrastructure policy in universities
- There is a concern to eLearning support. A message to policy makers to provide training and courses for educating what eLearning is and helping them to manage it more effectively and efficiently.
- A need to tailor eLearning to user needs and expressed concern about. A message to eLearning contents and service provider to produce eLearning that satisfies the needs and requirements of learners.

5.5 ELearning Status at Palestinian Higher Education

5.5.1 Percentage of Learning / Teaching Supported by Technology

Respondents were asked to specify their current learning / teaching percentage that is supported by technology. The obtained results are shown in Table 5-4. The largest category of respondents (32.5%) said that their learning / teaching is supported by technology between 25-50%, 26.3% between 10-25%, 26.3% between 10 – 25 %, 18.0% of the respondents and finally 7.1% their learning / teaching is fully supported by

technology. It is pleasant, that more than half of the respondents (188, 55.6%) are making use of ICT as a support to learning and /or teaching for more than 25% of their learning and teaching which gives conclusions of more reliability to this questionnaire.

Table 5-4: Percentage of learning / teaching supported by technology

Learning / teaching supported by technology		Frequency	Percentage	Cumulative Percentage
Valid	0 -10%	61	18.0%	18.0%
	10 - 25%	89	26.3%	44.4%
	25 - 50%	110	32.5%	76.9%
	more than 25%	54	16.0%	92.9%
	all of it	24	7.1%	100.0%
	Total	338	100.0	

5.5.2 Rating eLearning Initiatives

Respondents were asked to rate eLearning initiatives in their institutions to find the quality provided by institutions. The results shown in Table 5-5., indicate the majority of respondents rate eLearning initiatives in their institutions as poor (95, 28.16%), good (91, 26.9%), fair (68, 20.1%). 59 respondent (17.5%) rate eLearning initiatives in their institutions as very good, while only 25 (7.4%) rate eLearning initiatives as excellent.

Table 5-5: Rating eLearning initiatives in respondents' institutions

		Frequency	Percent	Cumulative Percent
Valid	Poor	95	28.1	28.1
	Fair	68	20.1	48.2
	Good	91	26.9	75.1
	Very good	59	17.5	92.6
	Excellent	25	7.4	100.0
	Total	338	100.0	

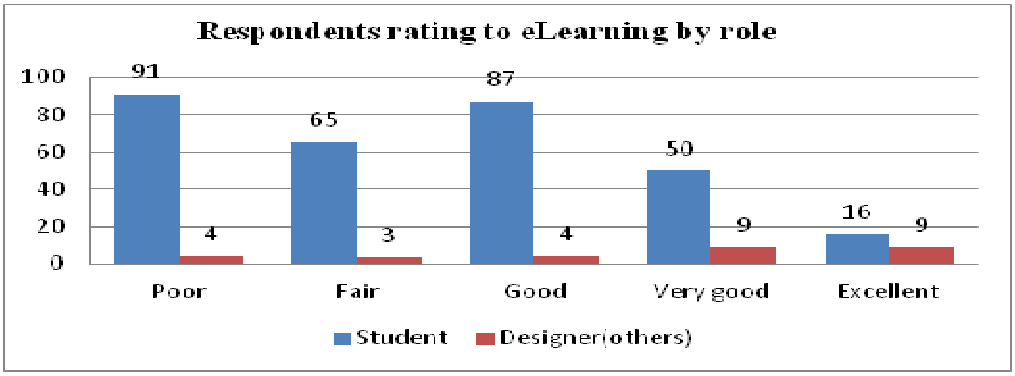

Figure 5-1: Responses rate to eLearning initiatives by role of respondent

Almost, 48% of the respondents rate eLearning in their institutions as poor or fair. This is an indication of lack of having good quality in eLearning as it is also reflected in the respondents' comments and concerns. That shows the demand for an eLearning quality model. Figure 5-1 shows responses by category learners and developers, 95 (91+4) respondents rate eLearning as poor, 68 as fair, 91 as good, 59 as very good and 25 as excellent. Learners rate eLearning initiatives with less quality while developers rate it as good increasing. This means that each group has different perspective in looking to eLearning and eLearning must be seen from all these perspective to of good quality.

5.5.3 How Much of Learning will be eLearning

Respondents were asked to choose how much of their learning / teaching will be eLearning in future. Their results are tabulated in (Figure 5-2). The respondents claimed that their future learning / teaching using eLearning if they choose the way to learn / teach will be some (137, 41%), a lot (81, 24.0%), all (54, 16.0%), little (49, 14%). Surprisingly, 5.0% (17 respondents only) choose not to use eLearning at all. That is, there is more than 80% are looking forward to use eLearning, which supports demand for developing and eLearning quality model. In general, more than 40% of respondents choose to adopt a lot or all of eLearning in their study in future, while very small percent 5% choose not to use eLearning in future.

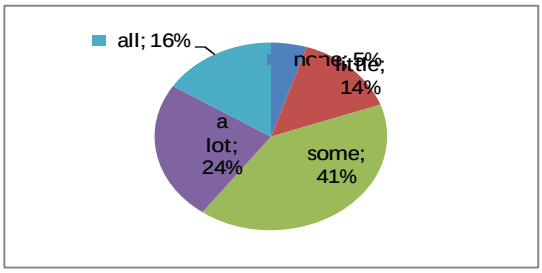

Figure 5-2: Future eLearning adoption by respondents

There is indication that eLearning will be increasingly used in future as a learning tool. This is possibly because respondents feel it is an effective way of learning, education and training. Therefore, we have to provide a good quality eLearning for every one and help others adopt this way of learning and teaching.

To see how respondents will react to eLearning in future, across tabulation is conducted between how much of learning respondent will choose with what percentage of your learning is currently supported by technology. Table 5-6 shows the cross tabulation of these two items. For those who stated that their current learning is only supported between 0 -10% only 13% choose not to use eLearning in future, while 31% of them said that some of their eLearning will be supported by eLearning, 21% of them said that a lot of their learning will supported, 24% said a little of their learning will be supported and only about 10% said that they will fully support their learning by eLearning. 48% of the respondents whose current learning is supported by ICT between 10-25% said that their future Learning

will be supported by eLearning and 20% of them said that a lot of their learning will be supported by eLearning. From the first row of Table 5-6 we can see only 5% of all respondents said that they will not use eLearning in future. This indicates that the use of technology to support learning is gaining the interest of all respondents in all universities. Therefore, a greet attention to quality of eLearning environment should be seen as a must in PHEIs.

Quality of eLearning initiatives in universities were rated fair and bellow by 48% of respondents, 27% as good, 18% as very good and only 7% rate eLearning initiatives as excellent. Therefore, these initiatives suffer from having good quality and being successful.

Table 5-6: Cross tabulation future learning supported by eLearning * current learning supported by ICT

			Learning supported by ICT					Total
			0 -10%	10 - 25%	25-50%	>50%	all of it	
Future learning supported by eLearning	None	Count	8	2	3	3	1	17
		% within Learning supported by ICT	13.1%	2.2%	2.7%	5.6%	4.2%	5.0%
	Little	Count	15	14	15	2	3	49
		% within Learning supported by ICT	24.6%	15.7%	13.6%	3.7%	12.5%	14.5%
	Some	Count	19	43	54	15	6	137
		% within I earning supported by ICT	31.1%	48.3%	49.1%	27.8%	25.0%	40.5%
	A lot	Count	13	18	27	21	2	81
		% within Learning supported by ICT	21.3%	20.2%	24.5%	38.9%	8.3%	24.0%
	5.00 All	Count	6	12	11	13	12	54
		% within Learning supported by ICT	9.8%	13.5%	10.0%	24.1%	50.0%	16.0%
Total		Count	61	89	110	54	24	338
		% within Learning supported by ICT	100%	100%	100%	100%	100%	100%

5.6 ELearning Critical Success Factors

5.6.1 Institutional Factors

To provide a quality eLearning, the institutional factors should not be ignored. Institutions should provide the necessary vision, objective, policies and strategies, and good leadership to provide quality eLearning in their institutions. These four measured criteria are: vision, policy and strategy, objective and leadership. The four criteria were measured in eight metric (questions).

While Table 5-7 shows valid respondents' number, minimum, maximum, mean score, standard deviation, and variance for each quality criteria, Table 5-8 reports question, mean, standard deviation statistic of each item .The criteria are arranged from the highest to the lowest mean score. There were three criteria that received mean score above 4.0, whereas the last is 3.560. The three criteria that had mean score above 4.0 are: policy, vision, and objectives. This shows that respondents are giving importance to institution factor as the main key for developing and implementing quality projects and these projects should be incorporated in HEIs. The other criteria that had a mean score less than 4 is leadership. Because all the mean score are above 3.5, they are considered important for the development of high quality eLearning.

Policy criteria were measured by: quality projects should be given strategic priority (M = 4.355, SD = 0.807) which ranked number 1 in this factor and with respect to all items, and quality projects should be given strategic priority (M = 4.278, SD = .804) and ranked 2 in this factor and with respect to all items. Respondents are saying that HEIs should put more effort on strategic quality planning relating to all initiatives.

Vision criteria were scored second and measured by two quality indicators: "vision should be clearly communicated" rated as the second item in institutional factor and with respect to all items (M = 4.355, SD = .839), and "quality should be integrated into corporation's vision" (M = 4.036, SD = .937). For eLearning to succeed PHEIs should create their visions toward eLearning and these visions should be integrated with quality statements to assessed and measured

Institutional objective was the third scored with a mean 4.137. It was measured by two items, these are Students or learners should play a main role in the quality process (M = 4.006, SD = 1.034), and senior leaders communicate a clear vision (M = 4.270, SD = .768). PHEIs objectives should be produced by a negotiation process and communicated to all parties for transparency and their reputations.

Table 5-7: Institutional quality criteria statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
		Statistic	Statistic	Statistic	Statistic	Statistic
Policy	338	1.00	5.00	4.3166	.68283	.466
Vision	338	1.00	5.00	4.1953	.73208	.536
Objectives	338	1.50	5.00	4.1376	.70994	.504
Leadership	338	1.00	5.00	3.5607	1.02998	1.061
Valid N (listwise)	338					

Leadership was the least rated criteria (M = 3.560, SD = 3.560, SD = 1.029). This criteria was rated with senior leaders communicate a clear vision (M = 3.515, SD = 1.151) and the institution builds active relationships with students (M = 3.602, SD = 1.211). Leadership is an important factor in directing their institutions towards the main vision and achieving objectives by communicating the vision clearly with all parities including students who are the main customers for the PHEIs.

Table 5-8: Institutional quality item statistics

Q#	Item	Mean	Std. Deviation	Rank	Total Rank
1	Quality should be integrated into the corporation's vision.	4.036	.937	5	6
2	The vision should be clearly communicated.	4.355	.839	2	2
3	Policy should incorporate quality.	4.278	.804	3	3
4	Quality projects should be given strategic priority.	4.355	.807	1	1
5	Quality objectives should be clearly defined.	4.270	.768	4	4
6	Students or learners should play a main role in the quality process.	4.006	1.034	6	8
7	Senior leaders communicate a clear vision.	3.515	1.151	8	43
8	The institution builds active relationships with students.	3.602	1.211	7	31

5.6.2 Student Factors

To measure student attitudes towards eLearning, respondents were presented with 9 items that could be viewed as helping student to attain and enrolled in eLearning. The first two items measure student motivation towards using eLearning. The next two items, (three and four) measures students' technical competency. Item five measures student interaction and collaboration. The next two items, (six and seven) measures students' attitudes towards eLearning. Last two items (item eight and nine) measures flexibility of eLearning.

Table 5-10 shows the respondents' number, minimum, maximum, mean score and standard deviation, and variance for each quality criteria related to student factor. The criteria are arranged from the highest mean score to the lowest mean score. All criteria were rated with a mean score higher than 3.594. The Technical competency item has the highest (M = 3.977, SD = .905), followed by flexibility criteria (M = 3.88, SD = 1.029). The lowest quality criteria were collaboration (M = 3.59, SD = 1.207).

Table 5-9: Item Total Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Competency	338	1.00	5.00	3.9763	.90549	.820
Flexibility	338	1.00	5.00	3.8817	1.02963	1.060
Attitudes	338	1.00	5.00	3.7737	1.02192	1.044
Motivation	338	1.00	5.00	3.7663	1.06959	1.144
Collaboration	338	1.00	5.00	3.5947	1.20763	1.458
Valid N	338					

Results shown in Table 5-10 indicates that technical competency quality criteria were ranked number one related to student factor and ranked number 5 with respect to all items. Technical competency criteria were measured by two items, these are "I enjoy using personal computers" and "I use computers to chat and send emails". Therefore, respondents can use computers and are not fear of using it. This has a positive impact on usefulness of computers and intension to use computers, which implies that they may be

considered technically ready to be enrolled in an eLearning course. Training on how to manage and use eLearning components to raise their different competencies. ELearning requires specific competencies (skills, knowledge, abilities) from learners to be successful.

Regarding eLearning flexibility and learning styles criteria, respondents agreed with the idea that eLearning helps flexibility in eLearning and allows them to choose the way they like to study (M = 3.852, SD = 1.112).

Respondents had good attitudes toward eLearning and they agreed with the idea that eLearning is good (M = 3.896, SD = 1.102), also they claimed that they learn better by eLearning systems (M = 3.651, SD = 1.197). Respondents, also agreed with the idea that eLearning encourages them to participate more in discussion and motivates them, helps them to interact and collaborate through discussion groups. Respondents are ready for eLearning as they believe eLearning is good idea and they learn better by learning.

Motivated to use eLearning was measured with to items: “eLearning encourages me to search for more information” and “eLearning encourages me to participate more in discussions” and rated (M = 3.760, SD = 1.180; M = 3.772, SD = 1.139 respectively). Motivation to learn was rated within the 25 most important quality items to successful eLearning. Respondents have good motivation to use eLearning as it results in higher success and course outcomes. Interaction and collaboration during the learning process was rated satisfactory (M = 3.595, SD = 1.208). Respondents have good attitudes to participate in discussion groups which are a main factor in eLearning to minimize feel of isolation in eLearning sessions.

Table 5-10: Student quality item statistics

Q#	Item	Mean	Std. Deviation	Rank	Total Rank
1	eLearning encourages me to search for more information	3.760	1.180	7	22
2	eLearning encourages me to participate more in discussion	3.772	1.139	6	21
3	I enjoy using personal computers	4.101	.951	1	5
4	I use computers to chat and send e-mails	3.852	1.189	4	16
5	I do read as well as participate in the discussion group	3.595	1.208	9	33
6	I think eLearning is a good idea	3.896	1.102	3	14
7	I learn better by eLearning system	3.651	1.197	8	27
8	eLearning enables me to choose when and where to study	3.852	1.112	5	17
9	I can choose how to study	3.911	1.173	2	13

Student factor as a total was ranked as the second important quality factors for critical success in developing quality eLearning. E-learning has the potential to improve flexibility of learning for the learners and instructors. Applications can be used in a flexible way and can thus be more learner oriented, adapted to the learners' needs, requirements and objectives.

5.6.3 Pedagogical factors

Pedagogical factors were measured through five criteria in ten items. The five criteria measured in the pedagogical factor includes: learner-centered, engagement, effectiveness, ease of use and collaboration.

Table 5-11 shows the number of respondents, minimum, maximum, mean score and standard deviation, and variance for each pedagogical quality criteria. The criteria are arranged from the highest mean score to the lowest mean score. All five criteria received mean score above 3.707 except ease-of-use had mean score of 3.250. Table 5-12 shows mean score, standard deviation, rank within the factor and the overall rank of the items in the pedagogical factor. These ten questions were averaged on the basis of the main five criteria used to measure pedagogical factor.

Effectiveness quality criteria have the highest mean score (M = 3.860, SD = .994) in the pedagogical factor, and was measured by two items. These two items are: eLearning could improve my performance in learning and eLearning could improve my productivity in learning / job. From Table 5-12, we can see that eLearning could improve my productivity had a mean score 3.885 and ranked number two within this criteria and number 15 with the whole criteria. ELearning could improve my performance (M = 3.837) and ranked number 4 with pedagogical criteria and number 19 as a whole. Effectiveness is seen as the most important criteria in pedagogical factor as it improves their performance and productivity. So understanding learners' attitudes, how to engage them is very important improving eLearning effectiveness.

Table 5-11: Pedagogical five criteria statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Effectiveness	338	1.00	5.00	3.8609	.99474	.990
Learner-centered	338	1.00	5.00	3.7914	.88096	.776
Collaboration	338	1.00	5.00	3.7189	.87717	.769
Engagement	338	1.00	5.00	3.7071	1.16579	1.359
Ease of use	338	1.00	5.00	3.2505	.94336	.890
Valid N	338					

Learner centered quality criteria have the next highest score with a mean of (M = 3.791, SD = .880) and was measured by two items. These two items are: eLearning enable me to control my learning progress and I have the choice to select topics to be learned (M = 3.837, SD = 1.127; M = 3.746, SD = 1.076) respectively. About 75% of respondents agree that eLearning enables them to control learning progress or a choice to select topics to be learned. The remaining 25% were either uncertain or claiming that eLearning did not enable them to control their learning progress. Respondents agreed that eLearning takes their learning styles into consideration during the learning process. Learner-centered

environment focuses on achieving motivation and highest achievement is a critical success criteria for quality of eLearning.

Collaboration quality criteria was ranked the third in pedagogical factor (M = 3.718, SD = .877) and was measured by two items. These two items are: enjoy working in groups and contacting the instructor. Working in groups rated number one in the pedagogical factor (M = 3.929, SD = 1.084). However, ability to contact instructor as a way of collaboration during their study was the seventh ranked item (M = 3.509, SD = 1.154). Collaboration in eLearning is seen as a critical success factor by respondents.

The fourth criteria in pedagogical factor were Engagement (M =3.707, SD = 0.063). Table 5-11 and Table 5-12 shows that respondents agree on the importance of engagement in terms of attracting learners to continue their eLearning and. Also, it was ranked within the first 20 items out of the whole items. Respondents were attracted by eLearning which is a good indication to learn better, acquire more knowledge and achieve higher results.

Ease of use criteria was ranked the lowest (M = 3.250, SD = .943) in the pedagogical factor and was measured by two items: simple use of eLearning system and using eLearning system without written instruction. This may be explained as students do not get enough training material on how to use the eLearning system and they are facing difficulties in adapting themselves to its use. ELearning strategies should concentrate on making eLearning easier by providing more pre-joining support to all students.

Table 5-12: Pedagogical questions and statistics

Q#	Item	Mean	Std. Deviation	Rank	Total Rank
1	The eLearning enables me to control my learning progress	3.837	1.127	3	18
2	I have some choices to select topics to be learned	3.746	1.076	5	23
3	eLearning attracts my attention to materials	3.707	1.166	6	25
4	I think eLearning could improve my performance in learning / job	3.837	1.111	4	19
5	I thing eLearning could improve my productivity in learning / job	3.885	1.037	2	15
6	It is easy and simple to use eLearning system	3.388	1.153	8	58
7	I can use eLearning system without written instructions	2.985	1.265	10	89
8	Interaction with the eLearning system was clear and understandable	3.379	1.113	9	59
9	I can contact the instructor easily	3.509	1.154	7	44
10	I enjoy working in groups	3.929	1.084	1	12

Table 5-13 shows a cross tabulation between technological competency and engagement. Among those who do not enjoy using computer and do not chat, the majority (42.1%) are not engaged (attracted) by eLearning. Among those who do enjoy using computer and chat, the majority (73.3%) are engaged (attracted) by eLearning. About (68.3%) are enjoyed to use computers, chat, send emails, and they agree that eLearning attracts their attention. In this sample (N=338), more than two-third (68.3%) are enjoyed to use computers, to chat and send emails, and they agree that eLearning attracts their attention.

Table 5-13: Cross tabulation for Engagement * Competency

			Technological competency (enjoy and chat			Total
			Disagree	Neutral	Agree	
Engagement	Disagree	Count	8	18	40	66
		% within Competency	42.1%	36.7%	14.8%	19.5%
	Neutral	Count	5	4	32	41
		% within Competency	26.3%	8.2%	11.9%	12.1%
	Agree	Count	6	27	198	231
		% within Competency	31.6%	55.1%	73.3%	68.3%
Total		Count	19	49	270	338
		% within Competency	100.0%	100.0%	100.0%	100.0%

5.6.4 Cultural Factors

Table 5-14 shows the respondents' number, minimum, maximum, mean score and standard deviation, and variance for each quality criteria in the cultural quality factor. The criteria are arranged from the highest mean score to the lowest mean score. All criteria were rated with a mean score higher than 3.399. Respondents consider religious values item as the highest quality criteria (M = 3.624, SD = 1.077), followed by the writing styles and symbols. The lowest item was the criteria related to cross cultural (M = 3.399, SD = 1.003).

Table 5-14: cultural quality criteria statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Religious	338	1.00	5.00	3.6243	1.07753	1.161
Writing styles	338	1.00	5.00	3.6154	1.09219	1.193
Symbols	338	1.00	5.00	3.5917	1.06140	1.127
Globalization	334	1.00	5.00	3.5240	1.05311	1.109
Language	338	1.00	5.00	3.4467	1.02786	1.057
Cross Culture	338	1.00	5.00	3.3994	1.00308	1.006
Valid N	338					

Table 5-15, shows the data results of cultural quality criteria with their mean, standard deviation, rank and rank to total items. We can see cultural items in general where ranked in the middle of all items, which means that respondents are giving importance to this quality factor. Cultural issues in terms of religious, writing format and styles of content, usage of symbols in the design, support language, content avoids acronyms and ambiguous, and delivered in a language that can be easily understood by learners were rated satisfactory (M > 3.500) except one quality item rated low (M = 3.328). Respondents rated cultural factor as a quality and critical success factor for eLearning as the fourth

critical factor. Considerations of cultural issues is seen very important because it affects the learning and teaching process and accordingly to the success of eLearning and its quality.

Table 5-15: Cultural quality item statistics

Q#	Item	Mean	Std. Deviation	Rank	Total Rank
1	Contents are delivered in a language understood by learners	3.328	1.226	7	65
2	Support is in languages understood by all learners	3.565	1.009	4	36
3	The design is sensitive to cross-cultural issues	3.399	1.003	6	55
4	The design considers cultural and religious values	3.624	1.078	1	29
5	Symbols used were meaningful	3.592	1.061	3	34
6	Writing formats and styles were easy to understand	3.615	1.092	2	30
7	Contents avoids acronyms, and ambiguous words	3.524	1.053	5	42

5.6.5 Instructional Design and Interface Design Factors

Table 5-16 shows the respondents' number, minimum, maximum, mean score and standard deviation, and variance for each quality criteria in instructional design and interface design factor. The criteria are arranged from the highest mean score to the lowest mean score. All criteria were rated mean score with a means score above 3.000. That shows respondents are rating this factor as a CSF to eLearning and agreed on its importance to provide quality eLearning. The five criteria are: interaction, goals and objectives, learning resources, Interface, and personalization

Interactive learning environment to make learning meaningful and engage users through questions reviews and summaries is considered satisfactory by almost all respondents (M = 3.853, SD = .790). Interaction criteria was ranked number one in the instructional design factor by respondents which emphasized its importance. For eLearning to have good quality it must provide the necessary interaction to keep learners involved and motivated in the learning process.

Table 5-16 : Instructional design & interface criteria statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Interaction	338	1.00	5.00	3.8536	.79034	.625
Goals	338	1.00	5.00	3.4911	.80378	.646
Resources	338	1.00	5.00	3.4127	.97319	.947
Interface	338	1.00	5.00	3.3898	.81861	.670
Personalization	338	1.00	5.00	3.3299	.92520	.856
Valid N	338					

Goals and objectives of courses or learning material importance have also been highlighted by respondents and rated as the second quality criteria in this factor. Goals and objectives

quality factors includes: the issues of clearly stated objectives, learning outcomes, complete syllabus and assessments which reflect objective (M = 3.491, SD = .803). In general 49% of respondents agreed that it is important to specify goals and objectives to learners, 14% strongly agree, 16% were neutral to this idea, 15% disagree and only 6% strongly disagree. 63% of respondents agreed that specifying goals and objectives of learning is critical to quality of eLearning and producing effective and efficient eLearning. By specifying goals and objective learners will be aware of what will be achieved by the end of the course and will work to reach these goals during their study.

Learning resource quality criteria are measured in terms of content presentation and length of the course. (57% of the respondents agree / strongly agree, this implies that respondents highlights the importance of this criteria) 42% of respondents agreed on the importance that learning resource should be presented in the right context and course length should be sufficient, 15% strongly agreed on this, 17% uncertain, 19% disagree and 6% strongly disagree with this. Providing the right content within course period to learners will help them achieve the goals and objectives of the course.

Personalization quality criteria were measured by choosing what to learn and appropriateness of design to different users. 38% of the respondents agree on these criteria, 15% strongly agree. On the other extreme, 21% disagree, 20% with no opinion, and only 6% strongly disagree.

Table 5-17: Instructional design & interface items statistics

Q#	Item	Mean	Std. Deviation	Rank	Total Rank
1	Course and session objectives were clearly stated	3.559	1.144	4	37
2	The design clearly addresses learning outcomes	3.547	.983	5	40
3	Clear and complete syllabus were provides	3.266	1.150	12	76
4	Assessments and examinations reflects the objectives	3.592	1.053	3	35
5	The interactions within the course were meaningful	3.672	1.037	2	26
6	The design should include questions, reviews, and summaries	4.036	.946	1	7
7	eLearning system enables me to choose what I want to learn	3.533	1.138	6	41
8	The design is appropriate for different learners	3.127	1.147	14	85
9	The content of the course was presented in the right context	3.429	1.133	9	50
10	The length of the course was sufficient for the course	3.396	1.159	11	57
11	eLearning system is user-friendly	3.482	1.143	8	47
12	The screen layout was clear and pleasant	3.408	1.127	10	52
13	It was easy to navigate around the course	3.497	1.122	7	45
14	Feedback is timely and relevant	3.172	1.237	13	81

Interface and design criteria are very important to attract users to stay in the site and concentrating on learning and not on how to use the system. In general for each item in this criterion about 40% to 60% of respondents emphasized the importance of user-friendly, clear pleasant layout, and easy to use the system, 16% of respondents emphasized the very important of the design. On the other side, 17% of the respondents disagree with the importance of user interface, and 16% where uncertain about their answer. Only about 6% of the respondents strongly disagree and they said that eLearning system does not have a good design and interface. Problems faced by learners during the learning process must be supported in timely and relevant manner or, the learners might lose their interest to learn.

Therefore, a majority of respondents (30.8%) felt this criterion is very important in an eLearning program implementation. Some respondents (15.1%) have even put it as top priority. This criterion can be considered as a highly critical success factor. Interface design reflects the usability of the system which implies that users can perform the learning process successfully within the acceptable time and satisfied while using eLearning. Interface design provides more satisfactory to eLearning and it quality and should be considered as a main goal for designing quality eLearning.

5.6.6 Delivery Factors

Delivery of eLearning is done by eLearning platforms, in other word this quality CSF evaluates the quality of service provided. Table 5-18 shows that delivery criteria were rated low to satisfactory from respondents. Availability of eLearning system and quality of information were rated with a mean score above 3.5 while the rest were rated with a mean score between 3 and 3.5.

Availability of the system was rated the highest (M = 3.636, SD = 1.208) which implies that learners can use the system from anywhere, and this is a good quality indicator. 67.4% of respondents either agree or strongly agree that they can use the system from anywhere, 21.3% did not agree on this, and 11.5% were uncertain. Availability is very important as it is the way of delivering the material to learners. Since learners can access the system all the time it almost working and performing the functions intended to do. This is a key factor in eLearning and learners are not disrupted by disconnections during their learning process.

Quality of information was rated as the second high criteria (M=3.568, SD = 1.005) in terms of usefulness of the contents and their fitness to user needs. 56.8% of respondents agree that a content provided by eLearning system fits their needs, 24.9% disagree and 18.3% were uncertain. Regarding usefulness of contents 70.7% agree that contents provided were useful, 13.0% did not agree 16.3% were uncertain.

Table 5-18: Descriptive statistics for delivery CSF criteria

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
		Statistic	Statistic	Statistic	Statistic	Statistic
Availability	338	1.00	5.00	3.6361	1.20857	1.461
Information quality	338	1.00	5.00	3.5680	1.00582	1.012
Accessibility	338	1.00	5.00	3.4127	1.13767	1.294
Usability	338	1.00	5.00	3.3945	.93867	.881
Reliability	337	1.00	5.00	3.2700	1.20320	1.448
Interactivity	338	1.00	5.00	3.1479	1.14083	1.301
Valid N	337					

Accessibility of the system was rated as the third important criteria within this factor (M=3.412, SD = 1.137). On average about 60% of respondents agreed or highly agreed that eLearning system was accessible all the time. 30% did not agree and 10% were uncertain. Accessing the needed materials when it is needed is on of the advantages of any

eLearning system. This encourages learners to use it and motivates them to use eLearning which is critical to the quality of eLearning

Usability of the eLearning system was rated as the fourth criteria in this quality factor (M = 3.394, SD = .938). Usability was measured in terms of learning to use the system easily, downloading material without problems, efficiently, without errors and satisfied with easily learning to use the system.

Reliability (M = 3.270, SD = 1.203). . 51.2% of respondents said that they can recover quickly to operate the system after a failure, 29.9% did not agree with this and 18.6% were uncertain. The eLearning system has a capability of recovering from crashes and other software errors and return to its normal functionality which is a good indication of quality in the eLearning system.

Interactivity of the system was rate with lowest criteria in this factor (M = 3.147, SD = 1.140). About 48% of respondents agreed that the system was interactive and they enjoy using it. 15.7% did not agree and 24% were uncertain.

In general delivery factor was rated low to satisfactory by respondents, which shows that more development is needed to raise the quality of eLearning system.

Table 5-19: Delivery quality items statistics

Q#	Item	Mean	Std. Deviation	Rank	Total Rank
1	I can access the material all time	3.355	1.327	8	62
2	I can choose the time to study	3.470	1.228	4	48
3	I can use the eLearning system from any place	3.636	1.209	2	28
4	I can download material without any problem and quickly	3.436	1.211	5	49
5	I am satisfied with how easy it is to use this system	3.278	1.232	9	74
6	I can effectively complete my work using this system	3.364	1.171	7	60
7	It was easy to learn to use this system	3.497	1.087	3	46
8	I can recover quickly to operate the system after a failure	3.270	1.203	10	75
9	The students initiated most of the discussion	3.148	1.141	11	83
10	eLearning system provides content that exactly fits your needs	3.396	1.164	6	56
11	eLearning system provides useful content	3.740	1.091	1	24

For eLearning to be accepted the delivery system should be available, accessible, usable, reliable, and provides interactive to attract learners to continue using it.

5.6.7 Instructor Factors

Table 5-20 shows the respondents' number, minimum, maximum, mean score and standard deviation, and variance for each quality criteria related to instructor factor. The criteria are arranged from the highest mean score to the lowest mean score. All criteria were rated with a mean score higher than 3.00. The interactive and collaboration of instructor criteria were the highest (M = 3.55, SD = 1.007; M= 3.396, SD = 1070), followed by instructor teaching

style (M = 3.36, SD = 1.070), followed by instructor technical competency (M= 3.362, SD = 1.029). The lowest quality criteria were instructor attitudes towards students (M = 3.20, SD = 1.014). Instructor CSF is very important to provide an effective eLearning as they can play different roles (such as content developer, facilitator, etc.), affects student outcomes and they are a key factor to successful eLearning

Among the four criteria related to instructor factor, instructor role as a motivator and collaborating rated with the highest score mean (M = 3.557, SD = 1.015). This indicator was measured by instructors inviting students to ask questions / receive with a mean score of 3.566 answers and students were encouraged to participate in class and discussions with a mean 3.559. This implies the high level of cooperation during the teaching learning process to provide an interactive learning process and motivate learners. Instructors play a key role in the teaching and delivery process and not the technology.

Table 5-20: Descriptive statistics for Instructor CSF indicators

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Instructor role	338	1.00	5.00	3.5577	1.00758	1.015
Instructor Style	338	1.00	5.00	3.3698	1.07061	1.146
Technical competency	338	1.00	5.00	3.3624	1.02903	1.059
Teacher Students	338	1.00	5.00	3.2081	1.01445	1.029
Valid N	338					

The next important factor was teaching style of the instructor (M = 3.369, SD = 1.070). Respondent said that instructor maid the course material more interesting and the instructor was either active or very active in teaching the course via eLearning. The different teaching styles provided by instructor to support learning process the more positive learning will be to learners.

Table 5-21: Responses for Instructor CSF Indicators

Q#	Item	Mean	Std. Deviation	Rank	Total Rank
1	The instructor is enthusiastic about teaching the class	3.101	1.245	9	86
2	The instructor's style of presentation holds me interest	3.364	1.226	5	61
3	The instructor is friendly towards individual students	3.160	1.227	8	82
4	The instructor handles the eLearning units effectively	3.314	1.144	7	70
5	The instructor explains how to use the eLearning components	3.411	1.178	3	51
6	We were invited to ask questions/receive answers	3.556	1.155	2	39
7	We were encouraged to participate in class	3.559	1.107	1	37
8	The instructor is active in teaching me the course subjects via eLearning	3.331	1.204	6	64
9	The instructor made the course material interesting	3.408	1.247	4	52

In addition, instructors' technical competency was the third most important factor. Respondent either agree or strongly agree that the instructor explains the technical requirements on how to use eLearning (M = 3.362, SD = 1.029). Instructors need to have technical skills to succeed in their eLearning experience because eLearning class can not operate if instructors can not manage and use the technology. Moreover Instructor handles

eLearning units effectively. Instructor attitudes toward student indicator rated the lowest in terms of styles of presentation, friendly towards students, and enthusiastic about teaching.

5.6.8 Content Factors

Moving to the content quality factor, the result of evaluating this factor shows that respondents rated this quality factor as low in general. Table 5-22 shows the respondents' number, minimum, maximum, mean score and standard deviation, and variance for each quality criteria in the content factors. The criteria are arranged from the highest mean score to the lowest mean score. All criteria received more than 3.0 mean score. Ease of use was rated the highest while accuracy was the lowest.

Generally, the scores shown in Table 5-22 on the factor related to Contents were rated low by respondents. Ease of use quality criteria rated as the highest among all content quality criteria (M = 3.650, SD = .868) and was measured by two items (design of eLearning components was good and content are easy to access and navigate). From Table 5-23, content design was good (M = 3.953, SD = 1.030) which is ranked number one in the content factor and number ten within all items is seen to be more important than access and navigation of contents (M = 3.349, SD = 1.128). Therefore, ease of use in terms of the design of eLearning components is the most important factor for the content quality factor. This is indeed a very good quality factor to make is easy to be involved in eLearning. Again, organization of contents is very important (second) as the learners are learning on their pace without the existence of instructors.

Table 5-22: Content quality criteria statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Ease of use	338	1.00	5.00	3.6509	.86868	.755
Organization	338	1.00	5.00	3.3269	.94449	.892
Clarity	338	1.00	5.00	3.2949	.96159	.925
Interactivity	338	1.00	5.00	3.2811	1.21843	1.485
Accuracy	338	1.00	5.00	3.1114	.92893	.863
Valid N	338					

Organization of contents had been rated as the second important criteria in contents (M = 3.326, SD = .944). From Table 5-23, we can notice that respondents emphasized the importance of clarity of contents in terms of clearly explanation, presentation and written of contents and its understandability. Clarity of contents had been rated as the third important criteria related to contents quality factor (M = 3.294, SD = 961). For each item (Q6, Q7, and Q8) around 55% of respondents said that they agree or strongly agree with the importance of having contents which is clearly presented, explained, and written in an easy understandable way to be learned.

Interactivity of contents which keeps students interest during the learning process was ranked moderate with respect to other criteria related to contents (M = 3.281, SD = 1.218). Only 164 (48.5%) of respondents said that eLearning contents keeps them interest during

study. On the other side, 110 (32.6%) respondents said that eLearning contents did not keep the interest, while 64 (18.9%) were responded neutrally.

Table 5-23: Quality content items statistics

Q#	Item	Mean	Std. Deviation	Rank	Total Rank
1	The content was up to date	3.281	1.218	7	73
2	Contents are sufficient, accurate, and clear	3.228	1.129	9	78
3	Contents are free of errors	2.825	1.071	11	94
4	Contents are well organized	3.325	1.103	4	67
5	The content of the program was at an appropriate level of detail	3.328	1.079	3	66
6	The content was presented and explained clearly	3.314	1.141	5	69
7	Content language is concise and clearly written	3.264	1.141	8	77
8	The content provided is easy to understand	3.305	1.163	6	71
9	Contents are easy to access and navigate	3.349	1.128	2	63
10	I perceive the design of the eLearning components to be good	3.953	1.030	1	10
11	Contents are interactive and keeps me interest	3.195	1.234	10	79

Accuracy of content was rated the lowest by respondents. Accuracy of content was measured in terms: up to date, sufficient, accurate and clear and free of error (items Q1, Q2, Q3). Respondents rate contents free of errors the lowest (M = 2.825, SD = 1.71) and this rate is below 3 (the minimum acceptable rate). Failure to provide quality content may act as a barrier to eLearning. More importance should be given to this quality factor for the successful of eLearning and its quality as they are an essential element of eLearning.

5.6.9 Support Factors

Support is a service provided for eLearning users to enhance and improve the effectiveness of the eLearning. Support service was measured by three criteria which include: instructor support, student support and technical support. Each criteria is also measured by three or four items.

Table 5-24: Descriptive statistics for support factor

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Instructor support	338	1.00	5.00	3.7850	.95969	.921
Student support	338	1.00	5.00	3.1667	.99529	.991
Technical support	338	1.00	5.00	2.9186	1.05401	1.111
Valid N (listwise)	338					

Table 5-24 shows the descriptive statistics for the above mentioned indicators. The indicators are arranged from the highest mean score to the lowest mean score. Two criteria were rated with a mean score higher than 3.00. The instructor support criteria were rated as satisfactory, student support criteria were rated as poor. Surprisingly, technical support criteria was rated the lowest with a mean score of 2.918. A limited technical support is

seen in universities which may act as a negative impact on student outcomes. Learners need to be supported technically to progress in their study.

Instructor support criteria is a main criteria computed from three indicators using scoring average method (M = 3.785, SD = .959). These sub indicators are: technical assistance, pedagogical assistance, and continuous instructor training. Data analysis showed that continuous instructor training is the highest indicator from respondents and is ranked the first, instructor pedagogical assistance indicator is the second highest indicator and technical assistance is the least critical criteria. Generally, the scores shown in Table 5-25 on the factor related to Instructor support demonstrated high level of importance to instructor support. Continuous training to instructor to provide quality eLearning is seen by respondents as a critical key in providing quality eLearning. Instructors play a key role in any learning process and they should possess high pedagogical and technological background.

Student support quality criteria in the support CSF for eLearning was rated the second criteria (M = 3.1667, SD = .995). Student support was measured by three quality items: availability of eLearning components, adequate support to complete the eLearning session and course and pre-joining instructions and were rated low by respondents within this quality factor. Also, they were rated within the lowest 25 quality items between all items. This low rating for student support may act as a barrier to learners in their study and acts as a negative outcome such as withdrawal, non-completion and dropout.

Technical support was rated the least important by respondents. Collected data shows that all criteria for technical support were rated with a score mean of less than three except willing of support people to help which had a mean score of 3.094. This show that support services in universities regarding the use of ICT and learning is not performing well. Generally speaking from 40% to 45% of respondent did not agree that they are getting the required help from technical staff, around 35% agreed that technical help was good and 20% were uncertain. Students are not satisfied with the quality of technical support provided to them.

Table 5-25: Support quality criteria statistics

Q#	Item	Mean	Std. Deviation	Rank	Total Rank
1	Access to technical support staff is always available	2.751	1.281	10	96
2	Technical support staff shows interest in helping me	2.905	1.231	9	92
3	Technical support staff are willing to help me	3.095	1.219	6	87
4	I receive answers for my questions quickly	2.923	1.256	8	91
5	I received comprehensive course pre-joining instructions	3.041	1.270	7	88
6	I get adequate support for completing my courses	3.175	1.169	5	80
7	The eLearning components was available all the time	3.284	1.233	4	72
8	Technical assistance in course development should be provided	3.601	1.175	3	32
9	Pedagogical assistance should be provided to teachers/instructors	3.784	1.147	2	20
10	Instructor training should be a continuous process to support eLearning	3.973	1.140	1	9

Evidence from study reveals that instructor support, student supports are critical success factors for quality eLearning.

5.6.10 Technological factors

Table 5-26 shows the number, minimum, maximum, mean, standard deviation, and variance for each quality criteria in this factor. The criteria are arranged from the highest mean score to the lowest mean score. There were three criteria that received a mean score above 3.0, whereas the last three criteria are less than 3.0. The first three criteria are: security, accessibility, and availability. This means that respondents see these factors as critical to quality of eLearning. The other criteria that had a mean score less than 3 are effectiveness, reliability, and browsing. Respondents said that technological infrastructure is not efficient, they can not rely on university computer network and they had problems while browsing speed was not satisfactory. Table 5-27, shows the mean, standard deviation, rank within technology factor and rank to all items.

Security of the infrastructure while logging to institutions network is the most highlighted criteria in technological factor (M = 3.949, SD = 1.148) and rated number 11 between all items. Majority of respondents 265 (78.4%) said that they can log on to institution network with the same username and password; while 46 respondents (13.7%) claimed that they cannot login, and only 8% (27 respondents) were uncertain. Security is seen as a critical factor for quality of eLearning as it ensures the integrity and validity of information.

Results shown in Table 5-26 and Table 5-27 indicate that accessibility of internet from the institution network was rated as the second critical in this factor (M = 3.402, SD = .711). This indicates the acceptance of availability of Infrastructure in the institutions by respondents. In general, about 59% claimed that accessing internet from institutions was easy.

Table 5-26: Technological quality criteria statistics

	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
Security	338	1.00	5.00	3.9497	1.14801
Accessibility	338	1.00	5.00	3.4024	1.30881
Availability	338	1.00	5.00	3.3166	1.36633
Effectiveness	338	1.00	5.00	2.9467	1.24819
Reliability	338	1.00	5.00	2.9112	1.10748
Browsing	338	1.00	5.00	2.8373	1.11378
Valid N	338				

Availability of the institution web site was rated as the third critical criteria in the technological quality factor (M = 3.316, SD = .743). Availability enables to design and deliver of eLearning easily and count as quality to eLearning, while its absence might be counted as a barrier to design and delivery process.

Table 5-27: Technological quality items statistics

Q	Item	Mean	Std. Deviation	Rank	Total Rank
1	I can access the internet easily from institution network	3.402	1.309	2	54
2	I did not experience problems while browsing	2.813	1.306	7	95
3	Browsing speed was satisfactory	2.867	1.255	6	93
4	I can access institution websites with same account /password	3.950	1.148	1	11
5	I can rely on the institution computer network	3.136	1.307	4	84
6	The institution website never crashed or 'froze up'	2.686	1.344	8	97
7	Overall, the information technology infrastructure is efficient	2.947	1.248	5	90
8	I can access the institution web site at any time from any where	3.317	1.366	3	68

The fourth criteria in technological infrastructure quality factor was effectiveness of the IT infrastructure (M = 2.947, SD = 1.248). Here it seems that respondents were did not agree that institution infrastructure is efficient in total. This could prevent learners from taking eLearning course and affects negatively learning outcomes.

Reliability and browsing of institutions infrastructure network were rated very low by respondents with means (M = 2.911, M = 2.837) respectively. To explore the type of problems phasing the reliability, respondents claimed that web sites crashed and it was not easy to recover from these crashes and the browsing speed did not satisfy them. These problems disturb learners and their continuous use of eLearning. For eLearning to happen easily network reliability should be high and the browsing speed should be good enough without a delay.

5.7 Quality Factor Significant and Contribution to eLQM

Factor analysis refers to a group of multivariate methods for establishing dimensions within a data set and for data reduction (Hair et al. 1987 as cited in Bush, & Sinclair, 1991). In this study, principal components analysis (PCA) was preformed on the 10 quality factors. PCA was chosen over other extraction methods (e.g. principal factors) because the goal was to identify and to generate factor scores to analyze component contributions for the ten factors to eLearning quality, and to determine the amount of variance that can be explained by each factor. Hence, the number of factors to extract was chosen to be 1 factor. Varimax (orthogonal) rotation was utilized to improve component interpretation.

Prior to the PCA analysis, verification of PCA requirement analysis was done to check the appropriateness of factor analysis. Firstly, the number of valid cases for this set of variables is 338. With 338 and 10 variables, the ratio of cases to variables is 33.8 to 1, which exceeds the requirement for the ratio of cases to variables which should be at least 5 to 1. Secondly, principal components analysis requires that there be some correlations greater than 0.30 (more than one) between the variables included in the analysis, in this set there was 34 correlations in the matrix greater than 0.30, suggesting reasonable factorability. Thirdly, principal component analysis requires that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy be greater than 0.50 for each individual variable as well as

the set of variables. Measures of Sampling Adequacy are on the diagonal of the anti-image correlation matrix. The diagonals of the anti-image correlation matrix were all over .5, supporting the inclusion of each item in the factor analysis. Overall, Measures of Sampling Adequacy, for the set of variables included in the analysis was significant ($\chi 2$ (df = 36, N = 338) = 1468.96, $p < .001$), which exceeds the minimum requirement of 0.50 for overall.

During the PCA analysis, the communalities were all above .3 (see Table 1), confirming that each item shared some common variance with other items. Communalities represent the proportion of the variance in the original variables that is accounted for by the factor solution. Communalities represent the proportion of the variance in the original variables that is accounted for by the factor solution. The communality for the variable "Institutional factor" was 0.204 which was less than 0.30. The variable was removed and the principal component analysis was computed again. The variable was removed and the principal component analysis was computed again. The communalities for all of the variables included on the components were greater than 0.30 and all variables had simple structure. The final model had no loadings less than .3 on one component (considered to meet the minimal level), the components explain 51.33% of the variance (Table 5-28)

Orthogonal rotation (Varimax) was used in this analysis so that they are easier to interpret. This means, the final factors will be uncorrelated with each other. As a result, we can assume that the information explained by one factor is independent of the information in the other factors.

Table 5-28: Total variance explained for quality factor loading

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.620	51.331	51.331	4.620	51.331	51.331
2	1.198	13.308	64.638			
3	.667	7.406	72.044			
4	.625	6.949	78.993			
5	.499	5.540	84.533			
6	.426	4.734	89.267			
7	.384	4.272	93.539			
8	.302	3.360	96.898			
9	.279	3.102	100.000			

When interpreting the results from a factor analysis, most attention is devoted to the factor loadings. Recommendations vary as to the level at which a factor loading can be considered significant. A factor loading with an absolute value greater than 0.30 can be considered significant (Hair et al. 1987 as cited in Bush, & Sinclair, 1991). Loadings of approximately .30 indicate that the factor accounts for 9-10% of the variance in the variable and this is significant; loadings above .50 indicate that 25% or more of the variance is accounted for by the factor. The loading must exceed .70 for the factor to account for 50 percent of the variance.

Weighted scores were computed for each of the factors, based on the component matrix resulted from the factor analysis. Weighted score contribution are presented in Table 5-29. Higher scores indicated greater contribution to quality while lowers score indicates less contribution quality. Instructional design content, culture factors were weighted 12%. Instructor, delivery, support, technology and student factor were weighted 11%, student factor was rated 10%, while pedagogy was weighted 9%.

Instructional design weight contribution is 12% hence any improvement in this factor will result in an improvement and enhancement in quality eLearning about 12%. This is the same for content and culture. Instructor, delivery, supports and technology together contributes 44% to quality in eLearning.

Returning back to the institutional factor which was dropped from the analysis because its communality was 0.204, this may be explained differently. The factor may not relate to the rest of the items, additional factors similar to this may be added for future research. In our point of view, this factor is important and I argue that this should be included in the final model.

This factor was theoretically and empirically approved to be very important in directing the HEIs to achieve their mission and advance in quality and learners satisfaction.

Table 5-29: Component matrix of eLQM from the quality items

Quality factor	Component	Weight contribution
Instructional Design	.793	12%
Content	.789	12%
Culture	.778	12%
Instructor	.724	11%
Delivery	.722	11%
Support	.721	11%
Technology	.685	11%
Student	.625	10%
Pedagogy	.583	9%
	6.419	100%

5.8 Status and Requirements of eLearning in Palestine

The research instrument was constructed with the main of measuring how the main quality factors will be seen and recognized by Palestinian higher education stakeholders. Other objectives of the research instrument were to compute and weight (contribution) of each quality factor as rated by eLearning stakeholders, and to elicit and identify eLearning status in PHEIs.

Even though quality metrics measured by the research instrument were to detect whether these quality factors can be recognized by respondents they may separated into other two categories: requirement for quality eLearning and those that reflect the status of eLearning in PHEIs. Based on this categorization the quality metrics of main quality factors were separated into two these two categories. The analysis of these two categories will be presented in the next two subsections.

5.8.1 Current Status of eLearning in Palestine

Status of eLearning in Palestine as seen from the respondents' perspectives and point of view based on the main quality factors of eLQM is shown in Table 5-30, while criteria statistics for these main factors are shown in Table 5-31. Cronbach's alpha was 0.897 which is considered high enough.

Statistics in Table 5-30 shows that status of eLearning in Palestine is moderate to low as rated by respondents. Culture quality factor was the highest rated factor (M = 3.5118), followed by instructor factor, pedagogy factor, instructional design factor, content factor, delivery factor. Lastly technology factor (M = 3.0602) and support factor (M = 3.0429 where the least low rated factors.

Table 5-30: Status of eLearning in Palestine based on quality factors

	Mean	Std. Deviation	N
Culture	3.5118	.88436	338
Instructor	3.3661	.94293	338
Pedagogy	3.3454	.88255	338
Instructional Design	3.3258	.79264	338
Contents	3.2470	.80827	338
Delivery	3.2318	.90963	338
Technology	3.0602	.94752	338
Support	3.0429	1.02075	338

Culture quality factor was the highest rated factor (M = 3.5118) in terms of writing styles of eLearning content and symbols. Cultural issues in terms of writing format and styles of content, usage of symbols in the design were rated satisfactory and the highest quality criteria in the current status of eLearning in Palestine.

Instructor teaching styles (M = 3.3698) and technology competency (M = 3.3624) to support their teaching and helping them are good and instructors are ready to start teaching eLearning courses.

Pedagogy strategies to move learning to collaboration between instructors and learners (M = 3.5089) was rated satisfactory by respondents. This is a good indication as collaboration raises the quality of eLearning and helping students achieve better results and rate of retention. Ease of use of eLearning systems (M = 3.1820) was rated low by respondents. Learners are disappointed from using eLearning systems and the said that they need to be

trained on how to use these systems to concentrate more on the learning process and not on how to use the system.

Instructional design interface to allow learners to navigate a round the course was rated satisfactory (M = 3.4970) to choose how and what to learn. This helps learners and improves eLearning process. Learning resources, in terms of presenting course contents in the right contents and sufficiency of course length, were rated satisfactory (M = 3.4127). Providing learning goals such as clear and complete syllabus for courses was rated low by respondents (M = 3.2663). While providing eLearning, to satisfy different learners styles and needs, was rated low (M = 3.1272).

Table 5-31: Status of eLearning in Palestine for quality criteria

Main Factor	Criteria	N	Mean	Std. Deviation	Variance
Culture	Writing styles	338	3.6154	1.09219	1.193
Culture	Symbols	338	3.5917	1.06140	1.127
Culture	Language	338	3.3284	1.22601	1.503
Instructor	Teaching style	338	3.3698	1.07061	1.146
Instructor	Technical competency	338	3.3624	1.02903	1.059
Pedagogy	Collaboration	338	3.5089	1.15360	1.331
Pedagogy	Ease of Use	338	3.1820	1.01042	1.021
Instructional Design	Interface	338	3.4970	1.12233	1.260
Instructional Design	Resources	338	3.4127	.97319	.947
Instructional Design	Goals	338	3.2663	1.15046	1.324
Instructional Design	Personalization	338	3.1272	1.14722	1.316
Contents	Ease of Use	338	3.3491	1.12801	1.272
Contents	Organization	338	3.3284	1.07927	1.165
Contents	Clarity	338	3.3092	1.00731	1.015
Contents	Interactivity	338	3.1953	1.23393	1.523
Contents	Accuracy	338	3.0533	.94984	.902
Delivery	Usability	338	3.2781	1.23242	1.519
Delivery	Reliability	338	3.2692	1.20151	1.444
Delivery	Interactivity	338	3.1479	1.14083	1.301
Technology	Accessibility	338	3.4024	1.30881	1.713
Technology	Reliability	338	2.9112	1.10748	1.227
Technology	Browsing	338	2.8669	1.25527	1.576
Support	Student Support	338	3.1627	1.04221	1.086
Support	Technical Support	338	2.9231	1.25644	1.579

Content accessibility and navigability was rated low (3.3491). Organization of contents in appropriate manner (M = 3.3284). Content presentation, explanation and understandability (M = 3.3.92).Content interactivity (M = 3.1953). Content accuracy, and free of errors were rated (3.0533). Content quality criteria lack most of quality metric and rated low. More efforts from university management are needed to enhance quality of eLearning content to provide efficient and effective eLearning.

Delivery eLearning system usability was rated low (3.2781), reliability of eLearning system to operate well and easy to recover after failed was rated low (M = 3.2692), and interactivity of eLearning system to help student learn in a better and effective manner was also rate low (M = 3.1479). In general current status of eLearning delivery system are not

satisfying respondents and were rated low, More efforts and strategies are needed by universities to enhance the quality criteria eLearning delivery system.

Technology quality criteria accessibility was rated low (M = 3.4024), reliability was rated (M = 2.9112), and browsing speed was rated (M = 2.8669). These rating are blow the neutral point and ranges to disagreement of respondents. Infrastructure of eLearning is suffering from the minimum requirement to support the adoption of eLearning in HE.

Support to students during eLearning courses was rated (M = 3.1627), and technical support (M = 2.9231). Higher education support needs more efforts and strategies to help student to continue their learning and to provide eLearning environment.

5.8.2 Quality Requirement for eLearning Quality in Palestine

An analysis of eLearning stakeholders' perception and views to quality requirements in Palestine is conducted by splitting quality factors to requirements and status as stated in the beginning of this section. Respondents' perspectives and point of view based on the main quality requirement factors of eLQM is shown in Table 5-32, while criteria statistics for these main factors are shown in Table 5-33. Cronbach's alpha was 0.912 which is considered high enough to proceed with the analysis of these quality factors.

Results show that institutional factor (M = 4.0525), was rated as good, and the highest factor by respondents. Followed by three factors student factor (M = 3.785), pedagogical factor (M = 3.7352), instructional design and interface factor (M = 3.5766 respectively), culture factor (M = 3.2296), delivery factor (M 3.5126) were rated satisfactory. Content factor (M = 3.4426), instructor factor (M = 3.3829), support factor (M = 32922), and Technology factor (M = 3.2569) were rated low by respondents.

Table 5-32: Quality requirements in Palestine based on quality factors

Main Factor	Mean	Std. Deviation	N
Institution	4.0525	.52490	338
Student	3.7985	.80172	338
Pedagogy	3.7352	.67786	338
Instructional Design	3.5766	.62520	338
Culture	3.5296	.78265	338
Delivery	3.5126	.84655	338
Contents	3.4426	.78227	338
Instructor	3.3829	.88989	338
Support	3.2922	.83755	338
Technology	3.2569	.88182	338

Respondents had rated the institution's policy and strategy (M = 4.3166), vision (M = 4.1953) and objective (M = 4.1376) as good and are the most important quality criteria items for building a quality eLearning.

Learners are ready to participate and use eLearning as they have good competency in technology (M = 3.9763), able to collaborate (M = 3.9290) as this raises effectiveness of learning and teaching, believe in the flexibility of eLearning (M = 3.8817) as it raises and enhances learning and teaching process, have good attitudes towards eLearning (3.7737), and motivated (M = 3.7663) to use eLearning in their current and future learning and teaching.

Table 5-33: Descriptive statistics for quality requirements as rated by respondents

Main Factor	Criteria	N	Mean	Std. Deviation	Variance
Institution	Policy	338	4.3166	.68283	.466
Institution	Vision	338	4.1953	.73208	.536
Institution	Objectives	338	4.1376	.70994	.504
Institution	Leadership	338	3.5607	1.02998	1.061
Student	Competency	338	3.9763	.90549	.820
Student	Collaboration	338	3.9290	1.08441	1.176
Student	Flexibility	338	3.8817	1.02963	1.060
Student	Attitudes	338	3.7737	1.02192	1.044
Student	Motivation	338	3.7663	1.06959	1.144
Pedagogy	Effectiveness	338	3.8609	.99474	.990
Pedagogy	Learner centered	338	3.7914	.88096	.776
Pedagogy	Engagement	338	3.7071	1.16579	1.359
Pedagogy	Collaboration	338	3.5947	1.20763	1.458
Pedagogy	Ease of use	338	3.3876	1.15328	1.330
Instructional Design	Interaction	338	3.8536	.79034	.625
Instructional Design	Goals	338	3.5661	.81026	.657
Instructional Design	Personalization	338	3.5325	1.13762	1.294
Instructional Design	Interface	338	3.3540	.82647	.683
Culture	Religious	338	3.6243	1.07753	1.161
Culture	Language	338	3.5651	1.00896	1.018
Culture	Cross culture	338	3.3994	1.00308	1.006
Delivery	Availability	338	3.6361	1.20857	1.461
Delivery	Information quality	338	3.5680	1.00582	1.012
Delivery	Usability	338	3.4334	.94939	.901
Delivery	Accessibility	338	3.4127	1.13767	1.294
Contents	Ease of use	338	3.9527	1.02960	1.060
Contents	Organization	338	3.3254	1.10327	1.217
Contents	Clarity	337	3.2641	1.14108	1.302
Contents	Accuracy	338	3.2278	1.12887	1.274
Instructor	Teacher role	338	3.5577	1.00758	1.015
Instructor	Attitudes to students	338	3.2081	1.01445	1.029
Support	Instructor Support	338	3.7850	.95969	.921
Support	Student support	338	3.1746	1.16922	1.367
Support	Technical support	338	2.9172	1.09326	1.195
Technology	Security	338	3.9497	1.14801	1.318
Technology	Availability	338	3.3166	1.36633	1.867
Technology	Effectiveness	338	2.9467	1.24819	1.558
Technology	Browsing	337	2.8131	1.30615	1.706

Pedagogical factor, instructional design, and user interface are very important factors to produce efficient and effective eLearning by providing the necessary requirements and strategies to help learners in learning process. Providing effectiveness of learning (M =

3.8909), Learner centered environment (M = 3.7914), engaging learners to eLearning (M = 3.7071), providing collaboration environment (M = 3.5947), and simple, easy, and attractive environment for learners (M = 3.3879), interaction between learners and instructors (3.8536), announcing goals and objectives of learning sessions (M = 3.5661), easy and attractive user interface (m = 3.3540) are all necessary factors for quality and successful eLearning environment.

Providing quality delivery environment of eLearning systems, to deliver and mange the eLearning processes from administration, content development that takes into account learners culture and preferences, and the necessary infrastructure, will help and enhance the quality of eLearning.

Technology factor was rated as the lowest factor in these requirements. Technology factors: security (M = 3.9497) was rated as satisfactory, while availability (M =3.3166), effectiveness (M = 2.9467), and browsing (M =2.8131) were rated low by respondents. Technology is the backbone of any eLearning environment and if it is not robust quality of eLearning may suffer success.

Instructor role (M = 3.5577) was rated satisfactory, while instructor attitudes towards students (M =3.2081) rated low. Instructors in the eLearning environment especially in blended eLearning still play key roles in eLearning and more efforts and strategies should be directed towards this factor.

Instructor Support (M = 3.7850) rated satisfactory, student support (M =3.1746), and Technical support (M = 2.9172). Support provided to students during the eLearning course and before starting the course. More attention needs for these factors to provide quality eLearning.

5.9 Summary

This chapter presented detailed discussions on data analysis, sampling method. A discussion of the population and the development of the survey instrument were included. Then summarizes the findings of the survey related to eLearning status and quality criteria for the eLQM as viewed by respondents. Factor analysis was used to identify the significant and contribution of each quality factor in eLQM. Analysis of current status of eLearning in Palestinian higher education is conducted based on critical success factors and responses rating from research instrument.

Discussion and analysis of these findings, including their relationship with the literature, will be presented in the next chapter.

CHAPTER SIX

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6 FINDINGS AND DISCUSSIONS

This chapter starts with a brief summary of the study done in this thesis. Next, summarizes and discusses the main findings as regarded to the research questions and literature. This will be followed by the discussion and reflection on of the findings.

6.1 Introduction

The main objective of this study is to propose a hybrid eLearning quality model for the design, development and implementation of eLearning in the Palestinian Higher Education Institutions (PHEIs) so as to improve and enhance the quality of eLearning as indicated in chapter one section 1.3 and chapter three, section 3.2. The overall objectives include:

- To provide a set of critical success factors that could enhance eLearning.
- To propose a quality model in eLearning implementation in the HE.
- To develop a set of recommendations to assure eLearning quality.

To achieve these objectives, the thesis has answered the following main questions:

- What are the critical success factors for eLearning in the HEIs?
- How to manage and enhance quality of eLearning in the higher education section?
- What are the recommendations in implementing the quality in eLearning scheme?

To answer these questions, several techniques were used. To address the first question, the researcher has conducted an analysis of the literature on CSF to determine their benefits and limitations. By integrating these studies and adding current and future challenges issues a new set of CSF has been identified and proposed. To address the second question, a literature review on the most important eLearning quality models was conducted. The theory and philosophy behind each quality model was identified and explored. A hybrid quality model for eLearning has been proposed. A quantitative research methodology, namely the questionnaire was used to validate the model. Lastly, to answer the third question, a literature review was conducted to find the most recommendations for each quality factor of the proposed model.

This chapter presents each research question, the corresponding approach, and the data collected to answer the question.

6.2 Main Findings

The discussion of the main finding is introduced in the following two sub sections. The first part is related to the status of eLearning at the Palestinian HEIs. The second part is related to critical success factors for eLearning in higher education. It also discusses the findings related to critical quality success factors introduced in the new proposed eLearning model, namely "eLQM".

6.2.1 Status of eLearning at Palestinian Higher Education Institutions

Respondents are almost familiar with the use of ICT. Most of the respondents (92%) belong to Universities with a primary role as learners, while the rest 8% are distributed as instructors 3%, developers or designers 2% and others 3%,. Since respondents other than students are involved in a way or another in the development process of eLearning we may call them developers for eLearning. Within this view we may assume that this survey represents the perspectives of learner with very little view of developers.

56% of the students and developers are using eLearning to support their learning and teaching for at least 25% of their study, while about 26% of them use eLearning to support at 10%-25% of their study. The remaining 18% are using eLearning to support 0-10% of their learning and teaching.

Respondents rate eLearning Initiatives differently, while most learners (51%) rate it as poor or fair, most developers' (76%) rate is as good or better. This means that we have different perspective on eLearning evaluation and for providing good and quality eLearning all eLearning stakeholders' view must be taken into considerations. This is in accordance with many findings (Ehlers, 2004; Middlehurst, 1992; Harvey and Green, 1993; Dondi, 2009) that quality of eLearning should consider all stakeholders views as discussed in chapter two, section 2.3.4.

The future of learning, education, and training in higher education is eLearning. 95% of respondents will use eLearning in future which is showing a future trend in using eLearning as learning or teaching method. This trend must be accompanied by an increase quality demand by all parties of PHEIs. Strategies should be directed to the remaining 5% to support and encourage them to adapt this type of learning and teaching. These strategies must be directed to providing good quality contents, developing skills to start using eLearning, minimizing difficulty of accessing computer, barriers (obstacles) of using eLearning such as speed, infrastructure and support.

6.2.2 Critical success Factor for eLearning in Higher Education

The first research question addressed was: "What are the critical success factors for eLearning in higher education institutions?" The goal of the first research question was to establish a set of CSF to assure the success of eLearning design, development and

implementation. Answering this research question involved a thorough literature review to examine what quality CSF were present in the field of eLearning and determine whether these CSF appropriately reflect the successful of designing, developing and implementing eLearning.

Through this analysis, the researcher has noticed that these CSF are interrelated and interdependent and they should be considered as a whole to produce a successful eLearning system. Moreover, the emerging new challenges (such as course challenges, individual challenges, technological challenges and contextual challenges) in the field of eLearning especially in the developing countries should also be integrated in these CSF.

At this point, it was decided that a new set of CSF for eLearning quality was necessary to be developed in a meaningful way. Based on the existing CSF proposed by different studies, the researcher has developed a new set of CSF for eLearning quality, by adopting and adapting from the literature and creating new set of CSF. The set of the developed CSF are: Institutional Factors, Pedagogical Factors, Technological Factors, Instructional Design Factors, Delivery Factors, Content Factors, Cultural Factors, Student Factors, Support Factors, Instructors' Factors and Design Factors.

To provide successful eLearning institutions needs to have quality vision and objective related to eLearning and good leadership. Students need to be motivated, have good technology competency, good attitudes towards eLearning. Pedagogical factor to produce efficient and effective eLearning needs to integrate pedagogical principles, eLearning technologies, and learning theories. Cultural factors are used to enhance user performance and satisfaction, by considering aspects such as language, religious, symbols, writing styles. Instructional design and interface design to enhance the quality of teaching and learning. This can be done by defining and clarifying objectives, interaction, personalization, learning resources and content organization, interface design, navigation and feedback are required. Delivery ensures learning materials delivered to users in the most effective and efficient manner. Various approaches can be used to deliver learning contents such as synchronous mode, asynchronous mode or blended mode. Instructor factors are crucial key to the success of eLearning, because they act as a key in the teaching and learning process. Contents provide the necessary materials to learners to meet the objectives of the eLearning course. Support is a service provided for eLearning users to enhance and improve the effectiveness of the eLearning. Technology needed to develop and run an eLearning environment.

The synthesized CSF could ensure a successful e-Learning design, development and implementation from a holistic viewpoint and present guidelines for e-Learning management. These factors have been presented in chapter two sections 2.6, 2.6.1 and 2.6.2. This answers the first question in thesis.

6.2.3 Managing and Enhancing eLearning Quality in HE

The second research question addressed the management and enhancement of quality in eLearning: "How to manage and enhance quality of eLearning in higher education?" To

answer this question, a literature review was conducted in different fields to identify the characteristics and relations related to quality of eLearning. The absence of a general quality model for eLearning which was emphasized by many researchers (such as Pawlowski, 2003b; Ehlers, 2007) and the challenging of finding a suitable framework (Hildebrandt & Teschler, 2004b) was the main driver of this research. Quality requirements and its perceptions in production, services, higher education and eLearning were reviewed and discussed in different sections of chapters two and three. Software quality models were studied and compared with each others to: find similarities and differences between these models as shown in (sections' 2.4 and 2.4.1), to identify characteristics and sub characteristics as presented in sections 2.4.2, to categorize a set of quality characteristics and to identify the most important quality factors to be used in the proposed model. General quality management approaches were reviewed and observed that they all concentrate on factors including leadership, people, processes, and customer results and quality is seen as a continuous development process as shown in chapter two, section 2.5. So these important factors were included in the proposed model eLQM as presented in chapter two, section 2.7.

A wide variety of models and frameworks have been developed to enhance and assure quality in the field of eLearning as shown in chapter two, section 2.7 and section 2.7.12. These models cover different aspects and perspectives for the quality of eLearning and investigated narrowly, dealing with specific aspects of quality in eLearning. Most of model concentrates on output and learning outcomes, while others concentrates on technology. Moreover, some of the developed models are process-oriented or product-oriented, target group, or other criteria (such as Infrastructure, design, methodology, motivation, learning material, assessments, and support).

The proposed quality model as discussed and argued in chapter three is a holistic hybrid quality model that combines all these characteristics together. Software quality models methodology, quality management approaches and characteristics are combined with instructional design strategies based learning theories, process oriented and product oriented views to produce the "eLQM". Software quality models hierarchy which decomposes quality goals into factors, criteria, and metrics method is used in this quality models. Quality management characteristics such as: leadership, people, processes, and customer results are also used in this model. Process-oriented includes project management processes (activities to mange development process) and development processes (activities to produce eLearning) and definition of process requirements (such as teachers' requirements, students' requirements, pedagogical requirements, technological requirements, and institutional requirements). Product-oriented to define specifications of operations needed from the eLearning to its users which include: learning operations, teaching operations, institutional operations and learners operations.

The proposed model has been tested and validated empirically by a research instrument (survey). Descriptive statistics was used to analyze the collected responses. The result shows that one quality factor, institutional factor, was rated as good by respondents (M = 4.052); three factors were rated satisfactory, these are: student (M = 3.798), pedagogical (M= 3.665), and cultural (M = 3.532). Six factors were rated low. We found that all the ten quality factors (institutional factor, student factor, pedagogical factor, cultural factor, instructional design and interface factor, delivery factor, instructor factor, content factor,

support factor and technology factor) significantly affect the quality of eLearning design, development and implementation.

The remainder of the chapter reports the major findings of the ten quality factors tested for eLearning quality from the collected data to determine the validity of the proposed quality model.

6.2.4 ELearning Quality Factors

Table 6-1 presents a summary of the quality factors statistics out of 5 points for the transformed quality items using the scoring system technique described in chapter four, section 4.4.

Table 6-1: Quality factor statistics

Quality factor	N	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic
Institution factor	338	4.0525	.52490	.276
Student factor	338	3.7985	.80172	.643
Pedagogy factor	338	3.6658	.66275	.439
Culture factor	338	3.5325	.76891	.591
Instructional design factor	338	3.4954	.62425	.390
Delivery factor	338	3.4049	.80005	.640
Instructor factor	338	3.3745	.85835	.737
Content factor	338	3.3330	.77712	.604
Support factor	338	3.2901	.80455	.647
Technology factor	338	3.2273	.82819	.686
Valid Numbers	338			

Results show that institutional factor was rated as, good (M = 4.052), the highest factor by respondents. Followed by three factors (student factor, pedagogical factor and cultural factor) were rated satisfactory (M = 3.798, M = 3.665, M = 3.532 respectively). The rest of quality factor were rated low by respondents, these factors are include: instructional design and interface factor, delivery factor, instructor factor, content factor, support factor and technology factor.

The survey consists of 97 items to measure and rate quality the CSF by respondents. The statistical results of these are shown in Appendix 6-1. Each row contains the main quality factor, criteria, question, mean, standard deviation, rank of the item within the quality factor, and the rank of each item within 97 items. Table 6-2 illustrates the most important 20 quality items between 97 items arranged from the highest mean score to the lowest mean score as rated by respondents. Respondents have stated that institution's policy and strategy (M = 4.355), vision (M = 4.355) and objective are the most important quality items for building a quality eLearning. These criteria includes: quality projects should be given strategic priority (M = 4.355), vision should be clearly communicated (M = 4.355), and policy should incorporate quality and clearly defined (M = 4.278). Here respondents emphasize the quality needed for eLearning projects and initiatives.

Table 6-2: Highest rated quality items of eLearning (Top 20 items)

Factor Name	Criteria	Item	Mean	Std. Deviation	Rank	Total Rank
Institutional	Policy & strategy	Quality projects should be given strategic priority	4.355	.807	1	1
Institutional	Vision	The vision should be clearly communicated.	4.355	.839	2	2
Institutional	Policy & strategy	Policy should incorporate quality.	4.278	.804	3	3
Institutional	Objectives	Quality objectives should be clearly defined.	4.270	.768	4	4
Student	Technology competence	I enjoy using personal computers	4.101	.951	1	5
Institutional	Vision	Quality should be integrated into the corporation's vision.	4.036	.937	5	6
Instructional Design	Interaction	The design should include questions, reviews, and summaries	4.036	.946	1	7
Institutional	Objectives	Students or learners should play a main role in the quality process.	4.006	1.034	6	8
Support	Instructor training	Instructor training should be a continuous process to support eLearning	3.973	1.140	1	9
Content	Ease of use	I perceive the design of the eLearning components to be good	3.953	1.030	1	10
Technological	Security	I can access institution websites with same account /password	3.950	1.148	1	11
Pedagogical	Collaboration	I enjoy working in groups	3.929	1.084	1	12
Student	learning style	I can choose how to study	3.911	1.173	2	13
Student	Attitudes	I think eLearning is a good idea	3.896	1.102	3	14
Pedagogical	Effectiveness	I thing eLearning could improve my productivity in learning / job	3.885	1.037	2	15
Student	Technology competence	I use computers to chat and send e-mails	3.852	1.189	4	16
Student	Flexibility	eLearning enables me to choose when and where to study	3.852	1.112	5	17
Pedagogical	Learner-Centered	The eLearning enables me to control my learning progress	3.837	1.127	3	18
Pedagogical	Effectiveness	I think eLearning could improve my performance in learning / job	3.837	1.111	4	19
Support	Instructor pedagogy	Pedagogical assistance should be provided to teachers/instructors	3.784	1.147	2	20

Regarding readiness to use eLearning respondents show their technological competency and readiness by enjoying using computers (M = 4.101) to chat and send emails (M = 3.852) and emphasize their role in defining quality process. User interface (M = 3.389) is also an important factor in building quality eLearning by allowing them to concentrate on learning and not to worry about learning how to use the system. Respondents gave a great importance to support that should be given to instructors (M = 3.785) in continuous bases in terms of pedagogical support. The overall design of eLearning components was rated well by respondents which show the importance of good design in eLearning quality (M = 3.389). Importance of security of infrastructure is highlighted by respondents (M = 3.949). Collaboration as a quality indicator is also counted as CSF by respondents (M = 3.718). ELearning flexibility (M = 3.881), effectiveness (M = 3.860) and learner centered (M = 3.791) rated within the first 25 quality items. Respondents point out that they are motivated (M = 3.766) and said that eLearning encourages them to participate in discussions (M = 3.772) and search for more information (M = 3.760).

Institutions commitment in terms of good leadership, vision and mission, and strategic planning will help in producing quality eLearning. Leadership assures the existence of eLearning and technology plan and its delivery to ensure its applicability and usage to develop quality and successful eLearning. Vision guides current practice and establish a common goal for the institution. Strategic planning addresses strategic and action planning, and how accomplishments are measured and sustained, based on learner needs.

Students are the main users and consumers of any eLearning. Understanding their requirements and need is very important to succeed in developing, designing and implementing the eLearning that leads to student satisfaction. They need to be motivated, feel competence in using technology, and expand their knowledge by providing more collaboration and social interactions during learning sessions.

Quality of interface design attracts learners keep them focusing in the learning process instead of looking and asking on how to use the system which makes them more frustrated. Moreover, the more interactive the design and the frequently feedback keeps learners more engaged and motivated and attracted to the learning session.

Pedagogical factor (such as pedagogical principles, eLearning technologies, learning theories, learning communities, collaboration, interaction, socio-cultural) to produce efficient and effective eLearning by concentrating on learning is very important. Not addressing these factors well, eLearning may suffer success, quality and good learning processes.

Providing a well designed eLearning components (M = 3.953) that contains useful content (M = 3.740) is a critical success criteria which were rated among the highest 25 criteria. These will engage users and keeps them returning back to use eLearning which helps because they believe that they will acquire and see useful contents to help and improve their outcomes. Providing instructors with continuous support (M = 3.976) and pedagogical assistance (M = 3.784) will raise the quality of eLearning which in tern brings

efficient and effective eLearning. Instructors play key roles in any teaching and learning process.

To summarize, these most important 20 quality items from the perception and view point of respondents are categorized in this study under the following main factors:

- Institutional factor
- Pedagogical factor
- Student factor
- Support factor
- Technological factor
- Instructional design
- Content factor
- Delivery factor

Table 6-3 shows the lowest 20 items rated by respondents as a quality indicator for building quality eLearning. Content criteria: accuracy, clarity and interactivity (M = 3.281, M = 3.264 and 3.195 respectively) were rated very low by respondents. Although these quality items are important in our point of view, respondents rated them in the lowest. This may be explained by the contents provided by eLearning to them does not have good quality, and this may stands as a barrier to adopt eLearning. Quality of content is very important to provide best knowledge to attract learners and effective learning. Here eLearning is still seen as e-contents and not as an eLearning and it seems that what is happening is just converting the material to an electronic form or just putting slide on the eLearning system. This was also shown in the comments and concerns of respondents as they show their concerns those contents should have high quality.

Delivery quality factor in terms of usability, reliability and interactivity was also rated low (M = 3.278, M = 3.270 and 3.148 respectively). Delivery is the process were actual learning occurs. When users can not use a eLearning system easily and efficiently (M = 3.041), cannot operate the system after a failure (M = 3.278) and contents are not interactive and engaging them in the learning process (M = 3.195), they may drop out or become distracted and spending more time on learning to use the system and not concentrating on the learning process.

Instructional design factor in terms of goals and objectives, interface design and personalization were rated low. Respondents rated goals and objectives item “providing clear and complete syllabus satisfactory” (M = 3.266), interface design in terms of “feedback is timely and relevant” (M = 3.127), and personalization in terms of “the design is appropriate for different learners” (M = 3.127). These criteria are very crucial in students’ achievements (Holsapple & Lee-Post, 2006; Khan, 2005). ELearning provided to respondents is not developed enough to include these factors and this may affect the adoption on eLearning by students. To increase and enhance learning outcomes learners should be provided with clear goals and objectives of the course, learning process through eLearning system should be easy and pleasant and should be easily personalized to their needs and requirements.

Table 6-3: Lowest 20 quality items rated by respondents

Factor Name	Criteria	Item	Mean	Std. Deviation	Rank	Total Rank
Content	Accuracy	Contents are sufficient, accurate, and clear	3.228	1.129	9	78
Content	Interactive	Contents are interactive and keeps me interest	3.195	1.234	10	79
Support	Student during course	I get adequate support for completing my courses	3.175	1.169	5	80
Instructional Design	Interface design	Feedback is timely and relevant	3.172	1.237	13	81
Instructor	Attitudes towards students	The instructor is friendly towards individual students	3.160	1.227	8	82
Delivery	Interactivity	The students initiated most of the discussion	3.148	1.141	11	83
Technological	Reliability	I can rely on the institution computer network	3.136	1.307	4	84
Instructional Design	Personalization	The design is appropriate for different learners	3.127	1.147	14	85
Instructor	Attitudes towards students	The instructor is enthusiastic about teaching the class	3.101	1.245	9	86
Support	TEC Responsiveness	Technical support staff are willing to help me	3.095	1.219	6	87
Support	Student Before starting	I received comprehensive course pre-joining instructions	3.041	1.270	7	88
Pedagogical	Ease of use	I can use eLearning system without written instructions	2.985	1.265	10	89
Technological	Effectiveness	Overall, the information technology infrastructure is efficient	2.947	1.248	5	90
Support	TEC Empathy	I receive answers for my questions quickly	2.923	1.256	8	91
Support	TEC Reliability	Technical support staff shows interest in helping me	2.905	1.231	9	92
Technological	Browsing speed	Browsing speed was satisfactory	2.867	1.255	6	93
Content	Accuracy	Contents are free of errors	2.825	1.071	11	94
Technological	Browsing	I did not experience problems while browsing	2.813	1.306	7	95
Support	TEC Tangibles	Access to technical support staff is always available	2.751	1.281	10	96
Technological	Reliability	The institution website never crashed or 'froze up'	2.686	1.344	8	97

Instructor attitudes towards students were also rated low. Quality item related to "The instructor is friendly towards individual students" rated low (M = 3.160), and the quality item related to "The instructor is enthusiastic about teaching the class" was also rated low (M = 3.101). From these two items, respondents are saying that instructors were not friendly towards students and were not enthusiastic about teaching the class.

Pedagogical quality item "ease of use" was measured by asking respondents to state their opinions on how much they agree to "I can use eLearning system without written instructions", was rated less than three (M = 2.985). Here respondents complained that they can not use the eLearning system without written instruction or not having the required instruction to operate the system before joining eLearning course. More concern should be given to learners before and during their join to eLearning. Strategies and policies should directed towards instructors should pay more attention to these points and provide more training on the pedagogical and instructional design theories to help instructors update themselves to new teaching styles and preferences

Support provided to students during the eLearning course and before starting the course were also rated low (M = 3.175 and 3.041 respectively). Also, all support items related to technical support in terms of "Technical support staff are willing to help me", "I receive answers for my questions quickly", "Technical support staff shows interest in helping me" and "Access to technical support staff is always available" were rated low (M = 3.095, M = 2.923, M = 2.905, M = 2.751 respectively). Here technical support staff is not performing well in the support process and this might stands as barrier to eLearning adoption.

Technological factors in terms of reliability, effectiveness, browsing speed, browsing problems, and reliability were also rated low by respondents (M = 3.136, M = 2.947, M = 2.867, M = 2.813, M = 2.686 respectively). Even though these quality items which are rated as the lowest 25 items are very important to quality eLearning they were rated as the lowest 25 quality items between the 97 quality items measured in this study. What comes from these rating is that eLearning is still in its initial state in terms of quality of contents, delivery, instructional design, support and technology availability and reliability.

To summaries, the main quality factor that affect quality eLearning in order of importance have been deduced from responses, later the most important 20 quality items followed by the least 20 rated quality items were identified and explained. In the following sub section each quality factor will be explained and discussed in more detail.

6.2.4.1 Institutional Factor

Institutional factor as critical success factor for providing quality eLearning, it was rated good and it was the highest factor rated by respondents (M = 4.052, SD = .524). This indicates that universities should provide the required policy and strategy by communicating their vision clearly to their customers and integrating quality into their vision, objectives and good leadership to start or improve their eLearning initiatives.

The findings of this study show that although the scores from institutional factors indicated good level of acceptance of e-learning, it was the factor with the highest mean score. This finding shows the concerns of respondents of the institutional essential role in the quality eLearning by stating their vision about eLearning clearly, integrating quality requirements for eLearning in vision and providing the necessary strategies and policies to achieve this.

The findings about organizational factors are in accordance with several authors, such as Khan (2005). Organizations, not only must understand the potential of e-learning, but to create the appropriate organizational strategies and approaches to optimize the benefits they offer for ICT. As explained by Jun et al. (2005) to be able to commit everyone to change and improve quality, managers have to unite the organization and direct everything towards achieving quality in eLearning. This goal has to reach the whole organization, be acknowledged and clearly understood by every one.

6.2.4.2 Student Factor

Student quality factor was rated as satisfactory, and as a total was ranked as the second important quality factors for critical success in developing quality eLearning (M = 3.798, SD = .801). Technology competency criteria came as the most critical criteria in this quality factor (M =3.976). Flexibility criteria came as the second critical with a mean 3.881. Attitudes towards eLearning came as the third critical criteria (3.773). ELearning has the potential to improve flexibility of learning for the learners and instructors, motivate them, help them interact and collaborate in discussions. Respondents had good attitudes toward eLearning and they agreed with the idea that eLearning is good (M = 3.773, SD = 1.021).

The most important findings on the student characteristics from the questionnaire are: student have good technology competency, motivated and have good attitudes to start eLearning are very critical success factors for eLearning. Respondents viewed their technical competency as an important factor to start eLearning and this could influence the use of technology. All these criteria will result in higher success and higher outcomes of using eLearning.

These findings are in line with other findings (Klein et al, 2006; Selim, 2007). This indicates that students' technical competency, motivation and attitudes towards eLearning are critical criteria for quality eLearning. This leads to conclude that future quality in eLearning should be oriented to learners' needs and preferences which have been concluded by other researchers such as (Ehlers, 2004).

6.2.4.3 Pedagogical factor

Pedagogical factor received the third highest mean (M = 3.665, SD = .662) and rated as satisfactory. Effectiveness of eLearning to improve performance and productivity in learning were rated the highest criteria in the pedagogical factor (M = 3.860, SD = .994).

Respondents also highlighted the importance of a learner-centered environment as it enables them to control learning progress allows them to choose what learn.

Collaboration as pedagogical factor was measured by two items: enjoy working in groups (M = 3.929, SD = 1.084) and contacting the instructor (M = 3.509, SD = 1.154)good (M = 3.718, SD = .877. Here, more importance is given to collaboration between groups and less to instructor collaboration. Through collaboration learners may learn more by participating in discussions and receiving feedback. This finding agrees with other studies (Govidasamy, 2001) to indicate that collaboration in learning is a crucial to succeed in eLearning.

Engagement of learners to start and continue using eLearning received the fourth rating in this category. Ease of use criterion was ranked the lowest (M = 3.250, SD = .943) in the pedagogical factor. This may be explained as students do not get enough training material on how to use the eLearning system and they are facing difficulties in adapting themselves to its use.

A correlation test was conducted, and revealed that competency and engagement were significantly related (r = +.251, n = 238, p < .01, two-tails). Also, assuming non-normal distribution of either one of the variables, a non-parametric test was run to determine the relationship between competency and engagement. There was a weak, positive correlation between competency and engagement, which was statistically significant ($r_s(8) = .241$, $P < .001$). Engagement is very important to enhance eLearning experience and ensure effective learning. Engagement of learners is done through interaction and motivational design such as using the ARCS (Attention, Relevance, Confidence, and Satisfaction) motivational model (Suzuki, 2009)

Different pedagogical strategies that suites learners needs and style must be developed and implemented to make eLearning more efficient and effective. The findings about pedagogical factors are in accordance with those of Sun et al (2005). Ehlers' (2004) emphasized the learner-centered approach to produce high quality eLearning environment that makes them engaged and motivated by providing more collaboration to attain high results. Various pedagogical approaches such as learner centered, collaboration, engagement and effectiveness are the core processes to quality eLearning. Pedagogical factors provide opportunities to develop a learner-centered, engaging, effectiveness, collaboration, and ease of use in eLearning environment.

6.2.4.4 Cultural Factor

Cultural quality factor was rated satisfactory (M = 3.665, SD = .439), and ranked the fourth most important CSF, which means that respondents are giving importance to this quality factor. Respondents consider religious values item as the highest quality criteria, followed by the writing styles and symbols. The lowest item was the criteria related to cross cultural.

In general between 54% - 67% of the respondents either agree or strongly agree with each item in this category, between 17% to 21% either disagree or strongly disagree with the

exception of one question related to language of contents it was 29%, the rest of respondents were neutral to each item.

About 29% of respondents said that contents are not delivered in a language that is understood by learners. This percentage is very high, a reason for this is that learning in universities is done in English and the students are not given preparatory course to advance in their learning in a language that is not their mother tongue.

This quality factor was suggested by Khan (2005) as sub factor of ethical factors. But in our opinion it is very important and it was proposed as a main factor when CSF was synthesized in chapter 2, section 2.6 and chapter 3, section 3.3.7. Learning is a social process and occurs in a cultural context (Gundry, 2001), for eLearning to succeed it must be designed based on cultural aspects to reflect individual needs, styles and preferences as stated by Zaharias (2008). Learning should enhance social and cultural values.

6.2.4.5 Instructional Design and Interface Design Factor

Instructional design quality factor for eLearning was rated low (M = 3.495, SD = .624). This factor was assessed in terms of providing interactive learning environment, specifying goals and objectives of courses, quality of learning resources during the learning process and personalization of eLearning had been emphasized by respondents and given a low level of importance.

The overall results of the user interface rating indicated that the criteria was low (M =3.389). These criteria comprise four items all related to design of eLearning system. In general 44% of respondents emphasized the importance of user-friendly, clear design and easy to use the system. Respondent agreed with the importance of interface and design criteria in terms of navigation around the course was easy, the system was user friendly, and screen design was pleasant.

Related to “Feedback was timely and relevant”, this quality items was rated in the lowest 25 items. Related to “Feedback was timely and relevant”, this quality items was rated in the lowest 25 items. Respondents during their eLearning sessions were not receiving feedback in the required time; this may be a barrier to them in adopting eLearning. Constructive and meaningful feedback (Govindasamy, 2001) is very important in eLearning environment. This finding contradicts Alexander (2000) findings as students rated communication as the major influence on their online learning experience.

In general instructional design aims to produce effective learning by defining objectives, selecting the appropriate subject, sequences it appropriately, and ensures connection between learning contents and interaction and assessment. It is also critical in motivating and supporting the learners. ELearning should be designed with a goal of good design and usability for learners to be effective, attractive and engagement.

6.2.4.6 Delivery Factor

Delivery quality factor of eLearning quality was rated low (M = 3.404, SD = .800). Delivery was assessed by accessibility, availability, usability, reliability, interactivity and quality of information.

Providing useful contents was rated within the first 25 (M= 3.740) criteria which mean respondents emphasizing its importance as being a high critical success factor in eLearning. Moreover, other delivery criteria such as "recover quickly to operate the system after a failure" (M= 3.270) and "I am satisfied with how easy it is to use this system" (M =3.278) were rated within the lowest 25 items.

Availability of using the system from any place (M = 3.636), providing useful information that fits user needs (3.396), accessing the learning material all the time (M =3.355), easy to use the system (M =3.497), downloading learning material without any problem (M =3.436), completing jobs easily and interactivity of the system (M = 3.364) are all good properties of a delivery system. Providing good services from learners view means they will come back and use the system again and again. This is a good indicator in terms of attracting, engaging and motivating learners to be involved in eLearning courses.

6.2.4.7 Instructor Factor

The overall results of the instructor factor rating indicated that this factor was rated low and as the seventh factor among all CSFs (M =3.374, SD = 0.858). This factor was measured by four criteria: instructor role (M = 3.557), teaching styles (M = 3.369), instructor technical competency (M = 3.362), and attitudes toward students (M = 3.208). Instructor role was the highest criteria in this quality factor. Respondents rated their encouragement to participate in class and discussions as the most important criteria in instructor factor. Instructor attitudes toward student were rated within the lowest 25 items, while all other criteria were rated in the middle of all criteria.

Instructor quality factor was given importance based on the pedagogical strategies used by the instructor during the teaching and learning session. Different teaching styles criteria was rated good and accepted by learners, the more collaboration and motivation from the instructor the more possibility of accepting eLearning from learners and the more positive learning outcomes. Also, technical competency of instructor in solving and helping learners the more easy learners may adopt eLearning.

Evidence from this study shows that instructor quality factor is a key factor in quality of eLearning. Also, the importance of instructor teaching style, instructor technical competency and instructor attitudes towards learners were emphasized as critical success factor for quality of eLearning. Instructors are key factors in any learning process as they may act as knowledge transferor, facilitator, coach and encourager.

Previous research showed that quality of instructor is an important key in the adoption of eLearning and providing effective eLearning (Volery & Lord, 2000), discussions in eLearning are very important as it enable learners to exchange knowledge and share ideas (Selim, 2005).

6.2.4.8 Content Factor

The overall results of the content factor rating indicated that this factor was rated low and as the eighth factor (M =3.33, SD = 0.777) between all factors. This factor was measured by five criteria: accuracy, organization, clarity, ease of use and interactivity. Ease of eLearning content components was rated with the most ten quality items.

Surprisingly, accuracy, clarity and interactivity criteria of contents were rated within the lowest 25 items. These items are: "The content was up to date" (M = 3.281), "Contents are sufficient, accurate, and clear" (M = 3.228), "Contents are free of errors" (M = 3.825), "Content language is concise and clearly written" (M = 3.264) and "Contents are interactive and keeps me interest" (M = 3.195). On the average 54% of respondents either agree or strongly agree with each statement, 30% of respondents either disagree or strongly disagree and about 16% were uncertain. This means that around one third of respondents were not with the opinion of quality contents. This may be explained that contents provided are unattractive, boring style of writing, undefined learning objectives, irrelevant contents and simple or complex content is provided.

Findings on contents shows respondents' ratings for the statements are considered as CSFs for eLearning quality are crucial for successful eLearning. This finding about content is in accordance with almost all findings in previous research. According to McGraw (2001) an e-learning model should address the creation of content that makes learning compelling, engaging and relevant to target audience needs. Selim (2005) found contents as a quality factor is important for eLearning and user satisfaction. Wang (2006) found that content quality affects usefulness and student perception toward eLearning. This means that content should be regularly updated and constantly maintained. Content criteria rated low such as "interactivity of contents" (M = 3.195) needs more attention to make eLearning more attractive and successful.

6.2.4.9 Support Factor

Support is essential for the success of eLearning. Support factor was measured by three main criteria: Technical support, instructor support and student support. The overall results of the support factor rating indicated that this factor was rated low and as the ninth factor within all factors (M =3.290, SD = 0.804).

Instructor support was rated the highest criteria in support factor (M = 3.785, SD = .959), and it was from within the highest 25 items. Instructor support criteria for pedagogical quality related to instructors was rated the highest. This implies that student are looking and giving too much importance to pedagogical.

Student support was rated the least important by respondent (M = 3.166, SD = .995). This low rating for student support may act as a barrier to learners in their study and acts as a negative outcome such as withdrawal, non-completion and dropout. This low rating for student support may act as a barrier to learners in their study and acts as a negative outcome such as withdrawal, non-completion and dropout.

Technical support was rated the least important by respondent (M = 2.918, SD = 1.054). Data shows that all criteria for technical support were rated with a score mean of less than three. Instructors are key players in any learning process, helping them in updating their knowledge continuously will increase the quality and successful of any eLearning initiatives. Respondents said that the technical support staff were not available all the time, not interested in helping or willing to help students and receiving answers to their questions related to technical help late. Technical support in universities seems to be not formed well. When learners needs help during their learning process getting the needed help was not easy to them. This makes learners frustrated and may increase drop out from eLearning courses.

For successful and quality eLearning design development and implementation support should be available all the time. Findings on technical support in this study reveal that a limited support service is available in Universities of eLearning.

This finding contradicts previous finding on the same factor. Selim (2007) finds the support factor to be the second wing of the technology as critical success factor foe eLearning acceptance. Here support as a critical success factor was rated before the last critical success factor for quality eLearning.

6.2.4.10 Technological Factor

Six criteria were used to measure technological factor: accessibility, browsing, security, reliability, effectiveness and availability of technology. The overall results of the technology factor rating indicated that this factor was rated the lowest factors (M =2.918, SD = 0.105).

The technology infrastructure was secure (M = 3.949, accessible (3.402) and available (M = 3.316). Majority of respondents 265 (78.4%) said that they can log on to institution network with the same username and password. About 59% of respondents said that it was easy to access internet from institutional network and 58% said that they can access it from anywhere.

However, effectiveness criteria (M = 2.946), reliability (M = 2.911) and browsing speed (M = 2.387) were rated very low. Effectiveness was rated as one of the lowest 25 items. Reliability of IT infrastructure was rated as the lowest criteria within the whole items. Respondents said that they can not rely on institutions computer network and web sites crashed and it was not easy to recover from these crashes and the browsing speed did not satisfy them. Again, respondents had experienced problems while browsing and speed was

not satisfactory to them. Technological factor in universities suffer from the basic quality criteria (such as efficiency, reliability and speed) that needs to be available as the backbone of any eLearning system from respondents view.

Technology in its self does not increase quality but its absence affects the quality of eLearning. Successful implementation of eLearning requires excellent technology infrastructure. This view is supported by many researchers (Alexander, 2001; Ehlers, 2004; Mason, 2001; Fresen and Boyd, 2005; Lanzilotti et al, 2006; Selim, 2007; Sun et al., 2008). These problems could affect quality and acceptance of eLearning. Therefore, these problems need to be solved and update by institutions in order to produce quality, efficient and enhanced eLearning.

6.2.5 Contribution of quality Factor to eLQM

eLQM was validated by conducting the research instrument and its analysis. Findings showed that all CSF of the eLQM was seen as important from the view point of the respondents. The research instrument "survey" was based on Likert-scale to measure respondents' attitudes and perception.

Factor analysis was conducted to identify and measure the significant of each of the ten CSF composes the eLQM. The result of this analysis shows that institutional factor was dropped as its communality was very low. The results from this analysis showed that "Instructional design" was significant and contributes by 12% to the quality factor of eLearning, "Content" 12%, "Cultural" 12% respectively. Followed by "Instructor", "Delivery", "Support" and "Technology" each contributes 11% to quality in eLearning. Finally, "Pedagogy" was also found to be significant and contributes 9%. These findings mean that improvement in any quality factor will contribute to the improvement and enhancement of eLearning quality with at least 9% in PHEIs. This means that effort should be concentrated on those factors that contribute highly to eLearning quality mainly "Instructional design", "Content", and "Cultural".

6.2.6 Answering Research Third Question

Regarding the last research question "What are the recommendations in implementing quality in eLearning?" The main objective of this research question was to establish a set of quality recommendations to succeed in developing a quality eLearning. A set of recommendations for each quality factor are explored and identified following the discussion of main quality factor in "eLQM" proposed and the findings from they survey.

To identify and establish a set of recommendations, a literature review was conducted in parallel with identifying the critical success factor and integrated with the major findings of this survey together with the result of last survey question which asks respondents to comments and write their concerns as discussed in chapter 5, section 5.6.2. While analyzing each critical success factor proposed by different researchers' benefits and

limitations of factors were determined. Later from these benefits and limitation a comprehensive set of guidelines and recommendation is generated in this section.

Institutional factor recommendation for improving the quality of eLearning includes:

- Quality vision should be clearly communicated to all higher education stakeholders.
- Define the initiative and vision around the strategy.
- eLearning quality objectives should be clearly defined by all stakeholders
- A quality strategy should be defined clearly into higher institution vision
- A strategy plan for e-learning with a vision including research, quality assurance and development activities.
- Have a good leadership in higher education institution
- Improve attitudes and attention of leadership and managers towards ICT
- Create and implement ICT policy to improve knowledge and skills for all
- Create comprehnsive plan for developing learning technologies.
- Create strategies for readiness of higher education to accept eLearning.
- Provide an adequate and reliable technical infrastructure to support e-learning.

Student factor recommendation for improving the quality of eLearning includes:

- eLearning should be developed to facilitate learning styles and preferences
- eLearning should be developed to enhance and improve student engagement

Pedagogical factor recommendation for improving the quality of eLearning includes:

- eLearning should be developed to facilitate learning styles and preferences
- eLearning should be developed to enhance and improve student engagement
- eLearning should be developed to various communication channels
- eLearning should be developed to enhance effectiveness, performance and productivity

Cultural factor recommendation for improving the quality of eLearning includes:

- Develop a training strategy for instructors in various cultures to accommodate such groups.
- Design the interface that considers cultural dimensions such as language, social factors, rules, norms, and values.
- Design contents that reflect the culture and needs of learners
- eLearning strategies should consider cultural factors to develop an effective eLearning
- Develop guidelines for writing styles to serve different users

Instructional design and interface design factor recommendation for improving the quality of eLearning includes:

- Defining and clarifying objectives for effective eLearning
    - Goals and objectives are clearly stated and announced.
    - The design should clearly address learning outcomes

    - Course overview and syllabus should be provided
    - Assessment and evaluation reflects should reflect the course objectives
- Interaction should be designed to reflect good eLearning practice
    - Interaction with contents should be meaningful.
    - Interaction with contents through questions, reviews and summaries
- Personalization of the eLearning environment should be designed to reflect learner's needs and expectations
    - Learners should be able to learn ant time the need.
    - The design is should provide different learners needs and styles
    - Learners should be able to learn any time the need.
    - Effective learning strategies that engage students should be present
- Learning resources should be selected and designed to reflect:
    - Developing learning resources should be appropriate for the specified course.
    - Sequencing of learning material should be aligned with goals and objectives
    - Length of the learning material appropriate and sufficient to clarify goals and objectives
- User interface should be designed to reflect:
    - Development of a user friendly eLearning system and contents based on technology and pedagogy principles.
    - Designing eLearning system and contents to be attractive and pleasant based on international standards

Delivery factor recommendation for improving the quality of eLearning includes:

- eLearning should be developed to facilitate learning styles and preferences
- eLearning should be developed to enhance and improve student engagement

Content factor recommendation for improving the quality of eLearning includes:

- eLearning should be developed to facilitate learning styles and preferences
- eLearning should be developed to enhance and improve student engagement

Support factor recommendation for improving the quality of eLearning includes:

- Strategy for student support including technical, administrative and social support on demand
- Strategy for faculty support including technical, ICT and information competence support on demand
- Strategy to support students' access eLearning and supportive materials
- Information to technical support is clearly communicated to the users.
- Instructions for contacting technical support are provided in the introduction or home page for the course, including
- Provide easy access to "Tech Help" resources
- A "Technical Support FAQ" is included prominently in the course materials.
- Staff support for the use of technologies for learning and teaching.

Defining the technical requirements needed to support the eLearning activities requires a technology infrastructure plan. This plan includes:

- ELearning infrastructure is integrated using defined standards
- ELearning infrastructure is reliable, robust and sufficient
- ELearning infrastructure is capable of communication and processes
- ELearning infrastructure should be mapped to quality eLearning standards
- ELearning infrastructure should be updated continuously

The purpose of these recommendations is to provide assistance and guidance to higher education institutions in developing their own quality eLearning. Also, these recommendations and guidelines can provide a foundation for institutional reviews and assessments for improving and assuring eLearning quality.

6.3 Chapter Summary

In this chapter, major findings related to each research questions in this study have been introduced and summarized. Then findings (results) of questionnaire were discussed in details and compared with other findings from similar studies. The questionnaire is used to validate the proposed quality model. Based on these findings conclusions and generalizations of the research can be made and generalized.

Next chapter, discuses these findings, conclusions, implication of findings to theory practice and recommendations for future research.

CHAPTER SEVEN

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7 CONCLUSION AND IMPLICATION

This chapter concentrates the discussions on the main concern of this study. The main concern of this study was to propose a hybrid quality model for eLearning to improve and enhance the quality of eLearning in Palestinian higher education institutions. Accordingly, in this chapter a discussion of the research main findings, conclusions about research problem, the theoretical contribution and implications, the practical contributions and the responding implications on quality eLearning implementation, the research limitations and recommendations and suggestions for future research.

7.1 Introduction

The rapid expansion of eLearning with the growing demand on higher education forces universities to adopt eLearning in their institutions, promotes great effort to enhance and assure the quality of eLearning. Accordingly, a variety of different quality models frameworks had been proposed and developed to assure quality of eLearning. These approaches describe quality of eLearning from different interpretations, aspects, perspectives and purposes.

Defining quality in general and particularly in education and eLearning is not an easy job. ELearning quality needs to combine the ***subjective nature*** of quality (such as educational paradigms, teachers' role, etc.) and ***objective dimensions*** (fitness for use or conformance to specification) such as accessibility, interface design, and other technical and infrastructural features with the complexity nature of learning and education. Quality has different meaning, different perspectives with different levels. Proposing a hybrid eLearning quality model to manage and enhance quality in higher education eLearning was the main objective of this study. The proposed hybrid eLearning quality model is a holistic hybrid quality model that combines the different quality perspective, with different learning theories and information system view.

With respect to these issues, this chapter focuses on the following issues:

- Summarizes research questions and findings regarding each question
- Proposes a hybrid quality model for eLearning to enhance eLearning based on the conducted literature review

- Provides a discussions on the reflections of the findings and the contribution to body of knowledge
- Outlines some recommendations for policy, practice and future research

7.2 Summary of Main Research Finding Results

As sated early, the main objective of this study is to propose a hybrid eLearning quality model. This objective was achieved by answering the research questions. These research questions were as follows:

What are the critical success factors for eLearning in higher education institutions?
How to manage and enhance quality of eLearning in higher education?
What are the recommendations in implementing quality in eLearning?

Chapter two provides an in depth literature review related to these questions and provides answer to question one. Chapter three provides answers to questions two and partially to question three. Chapter four, Methodology chapter, presents the methodology used to answer study questions. Chapter five presents the empirical data collected to validate the proposed model. Chapter six provides the major findings and discussions of this study based on the questions and the empirical data and complete answer to question three.

The findings with regard to first question in terms of eLearning CSF in higher education were presented in chapter two, section 2.6. The findings of this research question were used as a basis for the second research question. Addressing the second research question on how to manage and enhance quality of eLearning in higher education. A quality model was proposed and fully discussed in chapter 3. The experimental instrument to validate the proposed quality model was introduced in chapter 4, section 4.4. Lastly, the findings with regard to third question, in terms of recommendations and strategies for each main quality factor in "eLQM" were answered partially in chapter three and integrated with recommendations from the survey findings.

The findings of these three research questions together furnished the basis for the completion of proposing the "eLQM" proposed in this thesis. The following subsections describe each research question separately.

7.2.1 Findings Related to First Question

The failure of eLearning initiatives in the beginning raises the issue of providing successful and quality eLearning to front. Thesis first question was "What are the critical success factors for eLearning in higher education institutions?" This question was answered by proposing a list of critical success factor to provide a successful eLearning in higher education.

A set of critical success factors were synthesized from a thorough literature review and adding current and future challenges identified in literature. This list of CSF provides a comprehensive list of factors that must be considered for a successful eLearning. Also,

they affect the adoption and enhancement of eLearning initiatives in any university. Institutions must have the necessary vision built into quality strategy and good leadership to lead towards the vision and objectives of starting eLearning. HEI needs also to appreciate students' needs and requirements during their learning process. ELearning should be based on pedagogical, instructional design and pleasant user interface, cultural foundation for its success. Delivering eLearning system should satisfy user's needs. Provide the necessary technical and pedagogical support for instructors to update their knowledge continuously to support the learning process provided by HEI. Technological infrastructure to produce a quality and useful contents for eLearning to take place needs to be available and reliable.

Contribution of these critical success factors is to help institutions benefit from these CSF while assessing or entering into eLearning field to improve the quality of eLearning. Also, a successful eLearning provides many benefits to students during their learning process such as: improved quality to learning, improved productivity of learning, improved access to learning; and improved student attitudes to learning.

7.2.2 Findings Related to Second Question

As presented in chapter two section 2.3.4, quality in eLearning is perceived from different perspectives and dimensions, different stakeholders and processes and products it includes. To acquire a comprehension view of what constitutes quality in eLearning different quality models and frameworks were reviewed. These quality models had considered eLearning quality from different perspectives and specific point of views and not from a holistic point of view. For example "Quality on the Line" is a product-oriented benchmark; "ELearning success model", "ELearning quality (ELQ)" and "Process-Oriented lifecycle QA model for eLearning" are a process-oriented; "Model of subjective quality" is based on learners' perspective; "Five Pillars of quality on line" emphasizes teaching outcomes and continuous improving of quality; "Framework for quality of eLearning systems" is developed for the design and or evaluation of eLearning systems and emphasizes the interaction dimension; "A Layers-of-Quality model in online course" is based on instructional design theories to improve and enhance eLearning.

Basing on all these studies, a holistic hybrid quality eLearning model entitled "eLQM" for developing eLearning in the higher education sector to enhance the efficiency and effectiveness of learning has been proposed. The proposed quality model combines software quality models methodology, quality management approaches and characteristics are combined with instructional design strategies based learning theories, process oriented and product oriented to produce the "eLQM". Software quality models hierarchy which decomposes quality goals into factors (such as reliability, efficiency, usability, and functionality), criteria, and metrics method is used in this quality models. Quality management characteristics such as: leadership, people, processes, and customer results are also used in this model. Process-oriented includes project management processes (activities to mange development process) and development processes (activities to produce eLearning) and definition of process requirements (such as teachers' requirements, students' requirements, pedagogical requirements, technological requirements, and institutional requirements). Product-oriented to define specifications of operations needed

from the eLearning to its users which include: learning operations, teaching operations, institutional operations and learners operations.

The proposed quality model was tested and validated by a research instrument (survey). All quality factors and criteria which compose the eLQM were accepted by respondents and rated with a mean score above three except four criteria. These criteria are: effectiveness of technology, technical support, technology reliability and browsing.

Principal components analysis was preformed on the 10 quality factors. The analysis resulted in identifying the significance and contributions for the ten factors to eLearning quality. Instructional design factor was found to be the most significant and had the highest contribution 12% between all factors. Hence any improvement in this factor will result in an improvement in managing and enhancing eLearning quality with at least 12% followed by content and culture with the same contribution. The least significant quality factor found was the pedagogical and contributes to quality improvement with 9%.

Institutional factor was dropped during PCA analysis because it has a loading factor with less than .30. Theoretically this factor was emphasized by almost many researchers (IHEP, 2000; Alexander, 2001; Frydenberg, 2002; Marshall, 2006). This may be explained by, factor may not relate to the rest of the quality factors, or additional criteria similar to these included in this factor may be added to the set of CSF for future research.

Furthermore, universally accepted quality management approaches (ISO 9000, EFQM, MBNQA) emphasizes the importance of institutional factors such as vision, policy and strategy, leadership. Also, in the research instrument respondents had highlighted and agreed with every quality item in this factor and results showed that these items were rated within the most important 25 items. I argue that this factor should be included in CSF for quality in eLearning. The factor needs to incorporate additional criteria similar to this may be added for future research.

7.2.3 Findings Related to Third Question

The last research question is about recommendations in implementing eLearning in higher education institution. A set of recommendations was provided in chapter six, section 6.2.5. These recommendations were synthesized from the literature review and integrated with finding from the research instrument of the ten CSF and from the last question in the survey which contains the comments and concerns from respondents (discussed in chapter 5, section 5.6.2).

Recommendation such as implementing eLearning strategies for to assure the quality of these initiatives and it's successful. Providing quality contents that is accurate, up to date, free of errors, clear and interactive. Provide the necessary and required training to both learners (technical and support before and during eLearning sessions) and instructors (pedagogical and technical support continuously) to enhance the learning and teaching process. Providing and updating the necessary technological infrastructure in terms

hardware to increase accessibility and reliability, and the software to enhance the production process of eLearning.

7.3 Model Verification

The aim of this study is to contribute to enhance learning and teaching in PHEIs. This was done by proposing a hybrid quality model for eLearning. For this quality model to be effective it should be practically validated, as the development process of this model is seen as a continuous process of development, validation, and refinement. Then verification and validation of eLQM was done be referencing the literature and field verification.

The first process in developing this quality model was based on theoretical and practical knowledge. This was done by reviewing quality in eLearning and related fields, software quality models, general quality management approaches, and quality models in eLearning. This literature review concentrates on the contribution of literature to the quality of eLearning. Then the most important studies were identified and critically reviewed and compared with each others. The purpose of analyzing and comparing these approaches was to come up with the most appropriate characteristics that are valid for the successful and managing quality eLearning in HEIs. Later, the model should be defined and entered the validation process.

The literature survey resulted in the development of an initial hybrid quality model for eLearning. This model was refined and updated continuously during this study. This update includes adding or deleting some quality factor, criteria or items based on its importance. This literature review and the proposed eLQM were discussed in detail in chapter tow and chapter three.

The next step in this development process was eLQM validation. This validation process was done by data collection and validation of the model by using the collected data. Constructing a research instrument and administered in some of the Palestinian higher education institutions. Developing the eLQM from the literature review alone was not seen enough from the beginning of this study. Eliciting the attitudes, believes, and perception of eLearning stakeholders was seen as an important process in the validation of eLQM.

Research instrument was constructed and administered with the purpose of validation and verification of the eLQM for producing efficient and effective learning. The research instrument was in a survey form. Mainly the survey consists of demographic part and set of questions for the ten quality factors that consists the eLQM. The last question in the survey requested respondents to identify their concern and comments related to survey and eLearning. Survey was administered and collected in four universities. The purpose of this survey was to collect respondents' views perceptions, and feeling about the quality items included in eLQM to prepare for the validation process.

The data analysis started by recoding the data into a suitable form for SPSS and Microsoft Excel processing. Next, the data were analyzed and reported in chapter five and six. From

the analysis reliability of the survey was measured by Cronbach's alpha ($\alpha = .959$) which is considered to be very high and acceptable. Cronbach alpha was used because it the most used. Descriptive statistics was used to analyze and interpret the data. A scoring system method was used to find and compare the perception of respondents to quality factors. The most important perception of respondents was: Institution, Student, Pedagogy, Culture, Instructional Design, Delivery, Instructor, Content, Support, and Technology. Also the most important 25 quality criteria and the least important 25 quality criteria were identified based on respondents' perceptions.

Principal components analysis (PCA) was preformed on the 10 quality factors. The purpose of this was to identify and to generate factor scores to analyze component contributions for the ten factors to eLearning quality, and to determine the amount of variance that can be explained by each factor. The result of this analysis found to be as follow: Instructional design content, culture factors were weighted 12%. Instructor, delivery, support, technology and student factor were weighted 11%, student factor was rated 10%, while pedagogy was weighted 9%.

Based on these findings, we believe that the model is balanced and a good level of confidence of models was validated. Thus, in terms of relation between modeling and reality, this adds a high degree of validity to the proposed hybrid quality model for eLearning.

7.4 Other Findings

In addition to answering the main research questions other findings were found during this study. These may be summarized as:

- Quality in eLearning and higher education should be seen and intercepted from different perspectives and views. Quality should be seen as a continuous improvement and enhancement process.
- Future of learning and teaching is eLearning in PHEIs is eLearning as 95% of respondents said that the will use eLearning to support their learning teaching in future if they have the chance to choose how to learn or teach. This implies that:
  - eLearning in the future must shift from the E to the Learning
  - eLearning must be quality oriented.
  - eLearning must take into account the learners' needs.
  - eLearning must support teacher/trainer's role and skills.
  - eLearning is collaborative learning.
- Policy and efforts to manage and enhance eLearning quality should be directed towards the most significant CSF and not forgetting the other ones.
- eLearning quality is an issue not sufficiently faced in most Higher Education in Palestine. Even though, there are a lot of eLearning initiatives / projects in HEI quality of eLearning is still an issue to be considered seriously in Palestine HE.
- Current status of quality eLearning in PHEs still needs more efforts and development strategies. These efforts and strategies should be directed towards pedagogical, instructional design, content development, technological and support areas.

7.5 Conclusion about Research Problem

Empirical data collected in this study represents an overview of quality eLearning current situation among students (92%) and developers (8%) for design, development and implementation of the quality eLearning. In general, the most important evident that could be identified from the data are as follows:

- An increase in the use of ICT to support learning and teaching by learners and teachers.
- Awareness of importance of quality eLearning is evident between all respondents
- Instructional design and user interface factor is a major CSF for developing quality eLearning, followed by content and culture.

ELearning initiatives have been implemented in most universities to support learning, teaching and education processes. These initiatives, starting from e-contents (repositories of education resources) up to learning content systems.

Combining CSF identified from literature that are very important for developing quality eLearning with finding from data collected shows that more effort is needed to reach a quality design, development and implementation of eLearning in PHEIs.

In general, Institutional factor, perceived and rated as the most important factor, shows that institutional management should provide the necessary vision, objective, policies and strategies with good leadership to start quality projects such as eLearning. The technology factor, results as the lowest CSF for providing quality eLearning. Taking into account, that CSF were evaluated based on the average scoring system, CSF categories rank as follow, from the most important to the least: Institution factor, Student factor, Pedagogy factor, Culture factor, Instructional design factor, Delivery factor, Instructor factor, Content factor, Support factor and Technology factor.

Student are ready to participate and adapt eLearning as they have good technology competency, motivated and have good attitudes to start eLearning. Also, they are looking for flexible and different learning styles that satisfy their needs, requirements and characteristics. All these criteria will result in higher success and higher outcomes of using eLearning.

Different pedagogical strategies that suites learners needs and style must be developed and implemented to make eLearning more efficient and effective. Pedagogical strategies aim to: improve effectiveness (such as improves performance and productivity) of learners and learning process, provide learner centered environment, enhance collaboration and engagement, and simplify usage of eLearning system. Cultural aspects to reflect individual needs, styles and preferences are very important to provide successful eLearning.

Weighted scores were computed for each of the factors. Instructional design and user interface, content, culture factors were weighted 12%. Instructor, delivery, support, technology and student factor were weighted 11%, student factor was rated 10%, while pedagogy was weighted 9%. Higher scores indicated greater contribution to quality while lowers score indicates less contribution quality. An effort during managing and enhancing quality needs to pay more attention to higher scores as they contribute more the improving eLearning quality.

A major effort is still to be done related to quality factors rated low. These are: Instructional design factor, Delivery factor, Instructor factor, Content factor, Support factor and Technology factor. Similarly, as quality is a continuous development process that does not ends and people all the time are looking for the best, all other factors needs to be continuously improved.

7.6 Implication of Theory

Research suggests that eLearning is an effective and efficient way in learning, teaching and training. ELearning encourages collaboration and assures that learning is done in the right way yielding an effective learning to achieve the intended goals and objectives. Because eLearning helps achieving intended educational goals, it is important to manage and enhance its quality.

Research and analysis in this study reveals that providing quality eLearning is a complex, and challenging work. It needs an integration of all the fields that constitutes the eLearning context. These fields include: different quality views and interpretation, software quality concepts, total quality management views, pedagogy and instructional design theories based learning theories. Moreover, the design development needs to integrate the process-oriented and product-oriented approaches to provide quality eLearning.

Data analysis of the research instrument, also, shows that providing quality eLearning needs a consideration of the critical success factor. These critical success factors include: institutional factor, student factor, pedagogical factor, cultural factor and instructional design factors. These are followed by deliver factors, instructor factor, and content factor. The least important factor is the technological factor.

These findings have implication on the way eLearning quality is managed and enhanced in higher education institutions. They confirm that eLearning quality is the responsibility of institutions and its management in the first step. This concept is recognized by majority of respondents. Readiness of student, their belief in flexibility of eLearning, motivation to use it and their willingness to participate in the quality development process, is also an important factor that needs to be considered in the quality development process. Providing successful eLearning requires applying different pedagogical strategies based on instructional design theories which are based on different teaching and learning theories grounding them on cultural requirements and preferences affects and enhances eLearning quality. Providing quality and successful eLearning requires the consideration of cultural

factors and issues during the development process, since ignoring cultural issues may affect eLearning success and cause failing.

Considering the collaboration needed between different parties during the development process of eLearning environment, it is important to communicate and achieve the objectives and vision of eLearning by applying quality strategies. The importance of institutions and their leadership to provide the necessary pedagogical and technical support to these parties during the development process needs to be stressed and emphasized.

The conceptual framework of this study, can serve to guide future research. Based on the findings from the data analysis, discussion and literature review, the proposed conceptual framework provides some useful insight into the relationships

7.7 Implication for Policy and Practice

The results of the research have highlighted several invaluable contributions and implications for professionals, and particularly practitioners. The main practical contribution of this study for practitioners is to bring to their attention the critical success factors needed to manage and enhance eLearning quality in higher education institutions.

The proposed hybrid quality model for eLearning can be used to assure and enhance eLearning quality. This can be done by applying its all critical success factors or part of them depends on the objectives of the development process to be undertaken.

eLQM can also be used to determine the minimum requirements when starting eLearning initiatives and acts as starting analysis tool. It defines what should be measured and how to measure it. In this way it identifies the weakness and strength of the institutions and directs them where to put more effort and emphasizes during the development process.

The absence of and eLearning quality model in Palestine, to the knowledge of researcher, for developing and assuring quality in eLearning, makes it possible to take this model as a basis for national development of quality model in eLearning in Palestine.

More investment and effort to improve managing and enhancing quality should be directed to quality factors that had more significant and contribution to eLearning quality. These factors are: instructional design and user interface, content and culture.

The results of this study can form the basis for an ongoing discussion within the eLearning community and practitioners who are looking for improving and enhancing quality in eLearning. Results raise the awareness of most important quality factors in eLearning that should be considered while designing, developing and implementing eLearning.

7.8 Limitations of the Study

In this study some limitations were identified and that should be noted and pointed out for the sake of future research. These limitations will be discussed in more detail.

First, the proposed eLQM can not be considered as a final model, but should be seen as a work in progress which needs to be updated continuously. Even though the model has been tested and validated by respondents from four universities, more validation is required.

Student perspective is, of course, an important in building quality eLearning, but it does not constitute the whole picture. It is necessary, also, to include academics' and other stakeholders' views to achieve a comprehensive measure of quality. This can be done by including different eLearning stakeholders, particularly more instructors, developers, subject experts and others to ensure its acceptance by all parties.

Second, the sample size (N= 338), might be considered small to find attitudes about quality eLearning. Therefore, a research might cover a bigger sample that could be more representative and infer with better generalizations.

The knowledge of the participants, who are not really considered as expert in the field of eLearning or online learning may, affects the findings and consequently the generalization in these findings.

7.9 Recommendations and Future Work

This thesis is an effort to contribute in the area of eLearning quality and is obviously a work in progress. During the literature review, discussion and development of the quality eLearning model, the researcher interpretations and thoughts may influence the selection and determination of critical success factor. This implies that other factor may exists for managing and enhancing eLearning quality.

After proposing and validating the CSF for quality eLearning model, further actions have to be taken. As a suggestion for future research, we propose the following:

- Validation and updating of the proposed model by searching for other CSF and surveying other stakeholders' role such as involving instructors, developers pedagogical experts.
- Further research and development in this field to include quality factors for eLearning in vocational training, elementary and secondary education.
- Another important field of study is culture quality factors of eLearning.
- Research to assess of current status of quality eLearning in PHEIs to identify strength and weakness of quality eLearning to provide necessary recommendations and strategies for eLearning quality development.

REFERENCES

Abdous, M. (2009). E-learning quality assurance: a process-oriented lifecycle model. *Quality Assurance in Education, 17*(3), 281-295. doi:10.1108/09684880910970678

Abrami, P., Bernard, R., Wade, A., Schmid, R., Borokhovski, E., Tamim, R., Surkes, M., et al. (2008). A Review of e-Learning in Canada: A Rough Sketch of the Evidence, Gaps and Promising Directions. *Canadian Journal of Learning and Technology, 32*(3). Retrieved from http://www.cjlt.ca/index.php/cjlt/article/viewArticle/27/25

Aggarwal, A. K. & Makkonen P. (2007). Critical Success Factors (CSF) for Successful Globalization E-Learning. Retrieved March 20, 2011, from http://74.125.155.132/scholar?q=cache:pw_xbQSgzCEJ:scholar.google.com/+Critical+Success+Factors+CSF+for+Successful+Globalization+%22E+Learning%22+author:Aggarwal&hl=en&as_sdt=0,5.

Ahamed, S. S. (2010). An Integrated and Comprehensive Approach to Software Quality. *International Journal of Engineering Science and Technology, 2*(2), 59-66. http://www.ijest.info/docs/IJEST10-02-02-02.pdf

Albeanu G. (2007). *E-Learning Metrics.* Paper presented at The 2nd International Conference on Virtual Learning ICVL 2007, Constanta, Romania. Retrieved January 29, 2011 from http://www.cniv.ro/2007/disc2/icvl/documente/pdf/invited/invited2.pdf

Alexander, S. (2001). E-learning Developments and Experiences. *Education and Training*, 43 (4 -5), 240-248. Publisher: MCB UP Ltd. Retrieved February 15, 2011, from http://www.docstoc.com/docs/19850001/Conference-Papers-and-Presentations.

Alexander, S., & Golja, T. (2007). Using students' experiences to derive quality in an e-Learning system: An institution's perspective. *Subscription Prices and Ordering Information, 10*(2), 17–33. Citeseer. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.119.7249&rep=rep1&type=pdf#page=22

Alonso, F., Lopez, G., Manrique, D. & Vines, J. M. (2005). An instructional model for web-based e-learning education with a blended learning process approach. *British Journal of Educational Technology, 36* (2), 217-235.

Al-Qutaish, R. E. (2010). Quality Models in Software Engineering Literature: An Analytical and Comparative Study. *Journal of American Science, 6*(3), 166-175. Available at: http://www.americanscience.org/journals/am-sci/am0603/22_2208_Qutaish_am0603_166_175.pdf

Anderson, J., & McCormick, R. (2005). A Common Framework for E-learning Quality. *Policy and Innovation in Education. Quality Criteria*, 4-9. Available at: http://insight.eun.org/shared/data/insight/documents/quality_criteria.pdf

Anderson, A, & Grönlund, Å. (2009). A Conceptual Framework for E-Learning in Developing Countries: A Critical Review of Research Challenges. *The Electronic Journal on Information Systems in Developing Countries (EJISDC). 38* (8):1-16.

Arabasz, P. & Baker, M. B. (2003). Evolving Campus Support Models for E-Learning Courses. *Educuase for Applied Research (ECAR)*. Retrieved March 18, 2011 from http://www.educause.edu/ir/library/pdf/ERS0303/ekf0303

Arjomandi, M., Kestell, C. D., & Grimshaw, P. N. (2009). An EFQM excellence model for higher education quality assessment. In *AaeE Conference, Adelaide, Australia*. http://aaee.com.au/conferences/AAEE2009/PDF/AUTHOR/AE090149.PDF

Auzende, O., Joab, M., & Legrand R. (2008). *Modeling and Documenting Quality eLearning Processes with eLup*. *ICCE*, 2008. Retrieved March 20, 2010 from http://mams.rmit.edu.au/ntne8d1uyvz21.pdf

Aydin, C. H., & Tasci, D. (2005). Measuring Readiness for e-Learning: Reflections from an Emerging Country. *Educational Technology & Society, 8* (4), 244-257.

Batane, T. (2009). Technology Support for Student s Beyond the Classroom. Humanities, 1(1), 3091. Retrieved March 18, 2011, fromhttp://playpen.meraka.csir.co.za/~acdc/education/TEDC%202008%20Proceedings%20-%20Technology%20for%20Innovation%20and%20Education%20in%20Developing%20Countries:%20978-0-620-43087-6/Batane_Tshepo.pdf

Becket, N., & Brookes, M. (2008). Quality Management Practice in Higher Education - What Quality Are We Actually Enhancing? *The Journal of Hospitality, Leisure, Sport and Tourism, 7* (1), 40-54. Available at: http://www.heacademy.ac.uk/assets/hlst/documents/johlste/vol7no1/becket.pdf.

Biggs, J. (2001). The reflective institution: assuring and enhancing the quality of teaching and learning. *Higher Education, 41*(3), 221-38.

Boëhm, B. (1978) Characteristics of software quality. Vol. 1 of TRW series on software technology, North-Holland, Amsterdam, Holland.

Bourne, J., & Moore, J. (Eds.). (2002). *Elements of quality in online education* (Vol. 3). Needham, MA: Sloan-C.

Brookes M., & Becket, N. (2007). Quality Management in Higher Education: A Review of International Issues and Practice. *Higher Education Quarterly,1* (1), 1-23. Available at: http://www.blackwell-synergy.com/links/doi/10.1111%2F1468-2273.00104

Buglione, L., & Abran A. (1999). Quality Factor for Software. In Proceedings of the QUALITA 99: Third International Multidisciplinary Congress in Quality and Reliability, Paris, France, 335-344.

Bush, J., & S. Sinclair, A., (1991). A multivariate model and analysis of competitive strategy in the U.S. hardwood lumber industry. Forest Sci. 37(2):481-499.

Chin L., Kon, N., (2003). Critical Success Factors for E-Learning. In: *Proceedings of the Iadis International Conference e-Society*.Vol 49.; 2004:235–242.

Chinnery, M., (2006). Emerging Technologies - Going to the MALL: Mobile Assisted Language Learning. *Language Learning & Technology, 10* (1), 9-16. Retrieved, April 10, 2011, from http://llt.msu.edu/vol10num1/pdf/emerging.pdf.

Chua, C. (2004). Perception of Quality in Higher Education. *Proceedings of the Australian Universities Quality Forum, AUQA Occasional Publication*. Available from Internet: http://www.auqa.edu.au/auqf/2004/program/papers/Chua.pdf).

Crosby P. (1979). Quality is Free. McGraw-Hill, New York.

De Vries, F., Kester, L., Sloep, P., Rosmalen, P. v., Pannekeet, K. & Koper, R. (2005) Identification of critical time-consuming student support activities in e-learning, *Research in Learning Technology (ALT-J)*, 13(3), 219–229.

Deepwell, F. (2007). Embedding Quality in e-Learning Implementation through Evaluation. *Educational Technology & Society*, 10 (2), 34-43.

Deming, W.E. (1992). Out of the Crisis: Diseases and Obstacles. Massachusetts Institute of Technology, Mass 02139, USA.

Dondi, C. (2009). Innovation and Quality in e-Learning: a European Perspective. *Journal of Universal Computer Science, 15* (7), 1427-1439. Retrieved from http://www.jucs.org/jucs_15_7/innovation_and_quality_in/jucs_15_07_1427_1439_dondi.pdf

Dondi, C., Moretti, M., & Nascimbeni, F. (2006). Quality of e-learning: Negotiating a strategy, implementing a policy. In U.-D. Ehlers & J. M. Pawlowski (Eds.), *Handbook on quality and standardisation in e-learning* (pp. 31-50). Berlin: Springer.

Ehlers U. D. (2004). Quality in e-Learning from a Learner's Perspective. Proceedings of the Third EDEN Research Workshop, Oldenburg. – Germany: Bibliotheks-und Informationssystem der Universitat Oldenburg, pp 130–137.

Ehlers, U. D. & Pawlowski, J. (2004). Learning From Experience - Towards a Formal Model for Contextualization of Experiences for Quality Development, Proceed. IEEE International Conference on Advanced Learning Technologies - ICALT 2004 http://www.computer.org/portal/web/csdl/doi/10.1109/ICALT.2004.1357758

Ehlers, U. D., Goertz, L., Hildebrandt, B., & Pawlowski, J. M. . (2004). *Quality in e-learning: Use and dissemination of quality approaches in European e-learning*. European Centre for the Development of Vocational Training (Cedefop) Panorama series, 116.

Elissavet, G., & Economides, A. A. (2003). An Evaluation Instrument for Hypermedia Courseware. *Educational Technology & Society*, 6(2), 31-44, Available at http://ifets.ieee.org/periodical/6-2/4.html

Engelbrecht, E. (2003). A look at e-learning models: investigating their value for developing an e-learning strategy. Progressio, 25 (2), pp.38-47.

European Commission (2001). The eLearning Action Plan Designing tomorrow's education. Communication from the Commission to the council and the European Parliament. COM(2001),172 final.

Farrell, G. M. (2001). The changing faces of virtual education. *The Commonwealth of Learning Vancouver, Canada*. Retrieved March 9, 2011, from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.120.5688&rep=rep1&type=pdf.

Fresen, J. W. (2005). Quality assurance practice in online (web-supported) learning in higher education: An exploratory study. *Unpublished PhD thesis*, University of Pretoria, South Africa. Retrieved June 30, 2010, from http://upetd.up.ac.za/thesis/available/etd-02172005-134301

Fresen, J. W. (2007). A Taxonomy of Factors to Promote Quality Web-supported Learning. *International Journal on ELearning, 6*(3), 351-362. AACE. Retrieved June 11, 2011, from http://repository.up.ac.za/dspace/handle/2263/7351

Fresen, J. W. & Boyd, L. G. (2005). Caught in the web of quality. *International Journal of Educational Development*, *25*(3), 317–331. Elsevier. Retrieved June 8, 2011, from http://linkinghub.elsevier.com/retrieve/pii/S0738059305000027

Frydenberg, J. (2002). Quality Standards in e-learning: A matrix of Analysis. *International Review of Research in Open and Distance Learning, 3* (2), 4-11. Retrieved October 17, 2010, from: http://www.irrodl.org/index.php/irrodl/article/viewArticle/109/189

Fusani, M. (1995). Quality Models for Software Evolution Instruments. *Seminar in Software Measuring and Testing IER-CNR/Qualital/SSSUP Pis, Italy*.

Garcia, M. R. (2007). Quality in Distance Education: Perceptions in Private Liberal Arts Universities. *Paper presented in 6th WSEAS International Conference on EDUCATION and EDUCATIONAL TECHNOLOGY, 52-57*. Italy. Retrieved June 25, 2011, from http://www.wseas.us/e-library/conferences/2007venice/papers/570-313.pdf

Garvin, D. A. (1984). What does "Product Quality" Really Mean? *Sloan management review, 26* (1), 25–43. Retrieved May 10, 2011, from http://www.mendeley.com/research/product-quality-really-mean

Ghislandi, P., Pedroni, A., Paolino, D., & Franceschini, D. (n.d.). Quality in eLearning. Some results from a national research program. http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-398/S6_GhislandiEtAl.pdf

Gilmour, P., & Hunt, R. (1995). Total quality management. Australia: Longman.

Govindasamy , T. (2002). Successful implementation of e-Learning Pedagogical considerations. *Internet and Higher Education, 4* (3-4), 287–299. Retrieved March 26, 2010, from http://linkinghub.elsevier.com/retrieve/pii/S1096751601000719

Hadjerrouit, S. (2007). Applying a system development approach to translate educational requirements into e-learning. *Interdisciplinary Journal of Knowledge and Learning, 3*. Retrieved April 18, 2011, from

http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.102.4224&rep=rep1&type=pdf

Hameed, S., Badii, A., & Cullen, A. J. (2008). Effective E-Learning Integration with Traditional Learning in a Blended Learning Environment. *Information Systems*. EMCIS. Retrieved from http://www.iseing.org/emcis/EMCIS2008/Proceedings/Refereed Papers/Contributions/C 37/Blended_Learning efficiency asessment-OKOK.pdf

Harvey, L. & Green, D. (1993). Defining quality', Assessment and Evaluation. *Higher Education, vol. 18* (1), pp. 9–34. Retrieved March 26, 2009, from http://www.informaworld.com/smpp/content~db=all~content=a739130155.

Haworth, J. G., & Conrad, C. F. (1997). Emblems of Quality in Higher Education: Developing and sustaining high-quality programs. Boston: Allyn & Bacon.

Hildebrandt, U.B. & Teschler, S.J. (2004a). How to improve individual quality in the field of e-learning – the European Quality Observatory. *In e-mentor 5* (2004) 7. http://www.e-mentor.edu.pl/_xml/wydania/7/103.pdf.

Hildebrandt, B. U., & Teschler, S. J. (2004b). Localization and adaptation of quality approaches. *IEEE International Conference on Advanced Learning Technologies, 2004. Proceedings.*, 1078-1079. Ieee. doi: 10.1109/ICALT.2004.1357759.

Holsapple C.W., Lee-Post A. (2006). Defining, Assessing, and Promoting E-Learning Success: An Information Systems Perspective. Decision Sciences Journal of Innovative Education, 4 (1), 67-85.

Husson, A.M., (2004a). A specific Quality Approach to Satisfy the Needs of "clients" in e-learning. International Conference on Advanced Learning Technologies. Institute of Electrical and Electronics Engineers.

Husson, A.M. (2004b). Comparing Quality models adequacy to the needs of clients in E-Learning. In EQO Workshop@ICALT2004, Quality in European E-Learning: Designing Tools and Frameworks for Tomorrows Quality Development, Joensuu, Finland, EQO.

Institute for Higher Education Policy (IHEP) (2000). Quality on the line: Benchmarks for success in internet-based distance education. Washington, IHEP. Retrieved March 25, 2010, from http://www.ihep.org/assets/files/publications/m-r/QualityOnTheLine.pdf

IEEE (1998). IEEE Std 1074 -1997 - Standard for Software Life Cycle Processes.

ISO 8402 (1986). Quality Vocabulary. International Organisation for Standardization. Geneva, 1986.

ISO 9126 (1991). *ISO/IEC 9126*: Information technology - Software Product Evaluation - Quality characteristics and guidelines for their use.

ISO/IEC (2001). *Software Engineering – Product Quality – Part 1: Quality model, 2001*

ISO/IEC 19796-1 (2006). How to Use the New Quality Standard for Learning, Education, and Training. isotc.iso.org/livelink/livelink?func=ll&objId=6031339&objAction.

Kappelman, A., & McLean, R. (1991). The respective roles of user participation and user involvement in information system implementation success. Proceedings of the twelfth international conference on Information systems, New York, New York, United States, University of Minnesota, 339-349.

Kelly, B., Phipps, L. & Swift, E (2004). Developing a Holistic Approach for E-Learning Accessibility. *Canadian Journal of Learning and Technology*. 30 (3). Retrieved 18 May, 2011, from **http://www.cjlt.ca/index.php/cjlt/article/viewArticle/138/131**

Khan, B.H. (2001). A Framework for E-learning. Retrieved March 02, 2011, from http://www.elearningmag.com/elearning/article/articleDetail.jsp?id=5163

Khan, B. H. (2005). E-Learning QUICK Checklist. Hershey, PA: Information Science Publishing. http://books.google.com/books?hl=en&lr=&id=3-R2YPAJrFMC&oi=fnd&pg=PA2&dq=E-learning+quick+checklist&ots=QrIAP7k2Hw&sig=LhmeKXjm480upZibbsHADiNaYsE#v=onepage&q&f=false

Kitchenham, A., & Walker, G. (1989). A Quantitative Approach to Monitoring Software Development. *Software Engineering Journal, 4* (1), pp2-13.

Klein, J., Noe, R., & Wang, C. (2006). Motivation To Learn and Course Outcomes: the Impact of Delivery Mode, Learning Goal Orientation, and Perceived Barriers and Enablers. *Personnel Psychology, 59 (3), 665–702*. Wiley Online Library. Retrieved June 4, 2011, from http://onlinelibrary.wiley.com/doi/10.1111/j.1744-6570.2006.00050.x/full

Koohang, A., & du Plessis, J. (2004). Architecting Usability Properties in the E-Learning Instructional Design Process. *International Journal on E-Learning, 3* (3), 38-44. Norfolk, VA: AACE.

Lanzilotti, R., Ardito, C., Costabile, M. F., & De Angeli, A. (2006). eLSE Methodology: a Systematic Approach to the e-Learning Systems Evaluation. *Educational Technology & Society, 9* (4), 42-53 ISSN: 1176-3647.

Lagrosen, S., Roxana Seyyed-Hashemi, & Leitner, M. (2004). Examination of the dimensions of quality in higher education. *Quality Assurance in Education, 2* (2), pp 61-69.

Lee-Post, A. (2009). e-Learning Success Model: an Information Systems Perspective. *Electronic Journal of e-Learning Volume 7* (1), 61 - 70, available online at www.ejel.org

Liaw, S. S. (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system. *Computers & Education, 51*(2), 864–873. Elsevier. doi:10.1016/j.compedu.2007.09.005

Lim, H., Lee, S-G., & Nam, K. (2007). Validating E-learning Factors Affecting Training Effectiveness. *International Journal of Information Management, 27*(1), 22-35. doi: 10.1016/j.ijinfomgt.2006.08.002.

MacDonald, J., Stodel, J., Farres, G., Breithaupt, K.,& Gabriel, A. (2001). The demand driven learning model: A framework for Web-based learning. *The Internet and Higher Education, 4(1), 9 – 30.*

Mahmud, K. (2010). E-learning for Tertiary Level Education in Least Developed Countries: Implementation Obstacles and Way Outs for Bangladesh. *International Journal of Computer Theory and Engineering, 2* (2) , pp 1793-8201. Retrieved January 16, 2011, from http://www.ijcte.org/papers/132-G266.pdf

Mason, M. (2001). Globalising Education: Trend and Applications. London: Routledge.

Mccombs, L., & Vakili, D. (2005). A Learner-Centered Framework for E-Learning. *Teachers College Record, 107*(8), 1582-1600. doi: 10.1111/j.1467-9620.2005.00534.x.

McCall, A., Richards, K. & Walters, F. (1977). Factors in Software Quality, Volumes I-III, US. Rome Air Development Center Reports NTIS AD/A-049 014, NTIS AD/A-049 015 and NTIS AD/A-049 016, U. S. Department of Commerce.

McPherson, A. & Nunes, B. (2006). Organizational issues for e-learning: Critical success factors as identified by HE practitioners. *The International Journal of Educational Management, 20 (7)*, 542–558.

Menchaca, P., & Bekele, A. (2008, November). Leaner and instructor identified success factors in distance education. *Distance Education, 29*(3), 231-252. Retrieved February 24, 2009, from ProQuest database.

Milani, M. (2008). Cultural Impact on Online Education Quality Perception. *The Electronic Journal of e-Learning*, *6*(2), 149 -160. Retrieved from http://www.ejel.org/issue/download.html?idArticle=68

Ministry of Education and Higher Education (MOEHE) (2010). Statistical Year Book for the year 2009/2010 for Palestinian Higher Education Institutions, Ramallah, Palestine.

Moore, J. C. (2005). The Sloan Consortium Quality Framework and The Five Pillars: The Sloan Consortium. Retrieved on 21 May 2006 from www.sloanc.org

Nichols, M. (2002). *Development of a quality assurance system for e-learning projects*, ASCILITE, Auckland, NZ. 13. Pinkwart, N., C. Schafer, C., and Hoppe, HU http://www.ascilite.org.au/conferences/auckland02/proceedings/papers/004.pdf

Nyíri K. (2002). Towards a Philosophy of M-Learning. IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE 2002), August 29-30, 2002, Teleborg Campus, Växjö University, Växjö, SwedenQuinn, C. (2000) m-Learning: Mobile, Wireless, In-Your-Pocket Learning. Retrieved, April 10, 2011, from http://www.linezine.com/2.1/features/cqmmwiyp.htm.

Ong, C.S. ,Lai J.Y., & Wang, Y. S. (2004). Factors affecting engineers' acceptance of asynchronous e-learning systems in high-tech companies. *Information & Management, 41 (6), 2004, pp. 795-804.*

Ortega, M., Pérez, M., & Rojas, T. (2003). Construction of a Systemic Quality Model for Evaluating a Software Product. *Software Quality Journal, 11* (3), 219–242. Kluwer Academic puplishers.

Ozkan, S., & Koseler, R. (2009). Multi-dimensional evaluation of E-learning systems in the higher education context: An empirical investigation of a computer literacy course. *Frontiers in Education Conference, 2009. FIE09. 39th IEEE* (p. 1–6). IEEE. doi: 10.1109/FIE.2009.5350590.

Pawlowski, J. M. (2003). E-Learning Quality in Europe: Towards Individual Quality and Diversity Harmonization of Quality Approaches. *European Quality*. Retrieved from http://beta1.wi-inf.uni-essen.de/hh/bib-pdf-pub/5149.pdf.

Pawlowski, J.M., (2003b). "The European Quality Observatory (EQO): Structuring Quality Approaches for E-Learning," icalt, pp.209, Third IEEE International Conference on Advanced Learning Technologies (ICALT'03), 2003

Pawlowski, J.M. (2006): ISO/IEC 19796-1: How to Use the New Quality Framework for Learning, Education, and Training. White Paper, Essen, Germany, 2006.

Pawlowski, J. M. (2007). The Quality Adaptation Model: Adaptation and Adoption of the Quality Standard ISO/IEC 19796-1 for Learning, Education, and Training. *Educational Technology & Society, 10* (2), 3-16.

Pawlowski, J. M. (2007b). Quality mark e-learning: developing process- and product-oriented quality for learning, education and training. *International Journal of Learning Technology*, *3*(1), 51-71. doi: 10.1504/IJLT.2007.012367.

Pawlowski, J. M., Barker, K. C. & Okamoto, T. (2007). Foreword: Quality Research for Learning, Education, and Training. *Educational Technology & Society, 10* (2), 1-2.

Pawlowski, J. M., & Bick, M. (2001). The European Quality Observatory (EQO): Harmonizing Quality Approaches for E-Learning Harmonization of Quality Approaches. *European Quality*, 132-135.

Pawlowski, J.M., & Richter, T. (2008). A Methodology to Compare and Adapt E-Learning in the Global Context, MKWI, Munich, Feb. 2008.

Phipps, R. A., & Merisotis, J. P. (2000). Quality on the line: Benchmarks for success in Internet-based education. Retrieved July 29, 2003, from the Institute for Higher Education Policy Web site: http://www.ihep.org/assets/files/publications/m-r/QualityOnTheLine.pdf

Phillips, V. (2002, June). Why does corporate e-learning fail? *Virtual University Gazette.* http://www.geteducated.com/ vug/june02/vug0602.htm.

Rajasingham, L., & Zealand, N. (2009). Breaking Boundaries: Quality E-Learning for Global Knowledge Society. *International Journal of Educational and Teaching*, *4*(1), 58-65. doi: 10.3991/ijet.v4i1.664.

Rawashdeh, A. & Matalkah, B. (2006). A New Software Quality Model for Evaluating COTS Components. *Journal of Computer Science*, *2*(4), 373-381. Science Publications, New York, USA.

Rekkedal, T. (2006). State of the Art Report on Distance Learning and E-learning Quality for SMEs. Retrieved 27.03.2008 from http://nettskolen.nki.no/in_english/elq-sme/ELQ-SMEStateofArt.pdf

Rivers, J. (2005). Supporting Students in tertiary Study: A summary of a synthesis of research on theimpact of student support services on student outcomes in undergraduate tertiary study. Ministry of Education: New Zealand. http://www.educationcounts.govt.nz/publications/tertiary_education/5519.

Romiszowski, A. (2004). How's the E-learning Baby? Factors Leading to Success or Failure of an Educational Technology Innovation. *Educational Technology, 44* (1), pp. 5–27. Retrieved February 15, 2009, from http://BooksToRead.com/etp/elearning_failure_study.doc

Schulmeister, R. (2004). *Diversity of students and the consequences for e-learning.* In ICNEE, Neuchâtel. Switzerland.

Schreurs, J. (2006). EFQM and Kirkpatrick in a Framework for Evaluation of E-learning. *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education*, 1780-1785. Retrieved April 20, 2011, from http://uhdspace.uhasselt.be/dspace/bitstream/1942/1502/1/TQM.pdf

Selim H.M. (2007). Critical Success Factors for E-Learning Acceptance: Confirmatory Factor Models. *Computers & Education, 49* (2), 396-413. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0360131505001338.

Sharifabadi, S. R. (2006). How digital libraries can support e-learning. *The Electronic Library, 24* (3), 389-401. Retrieved March 20, 2009 from: http://www.emeraldinsight.com/Insight/viewContentItem.do;jsessionid=C42ADD1C3AFEF3B16439B8D699AD15BC?contentType=Article&contentId=1558896.

Singh, C. and Sareen, K. (2006). Effectiveness of ISO 9000 standards in Indian educational institutions: a survey, Int. J. Services Technology and Management, Vol. 7, No. 4, pp.403–415.

Siragusa, L. (2005). Quality eLearning : An instructional design model for online learning in higher education, 1-15.

Siragusa, L. (2008). Quality e-learning : Designing pedagogically effective web based environments for enhancing student online learning in higher education. *Forum American Bar Association*, 1-19.

SLOAN Consortium (2002). Quality framework for online education. Sloan Consortium. Retrieved October 14, 2010 from http://www.adec.edu/earmyu/SLOANC~41.html

Sparkes J. (1995). Quality in higher education, IEE Engineering Science and Eduaction", Journal, Vol. 4, No. 6, pp, 253-258, December 1995

Spiliotopoulou, G. (2009). Reliability reconsidered: Cronbach's alpha and paediatric assessment in occupational therapy. *Australian Occupational Therapy Journal, 56,* 150-155.

Sridharan, B., Deng, h., & Corbitt, B. (2008). Evaluating Intertwined Critical Success Factors. 19th Australasian Conference on Information Systems, 3-5 Dec 2008, Christchurch.

Srikanthan, G., & Dalrymple, J. (2001). A Fresh Approach to a Model for Quality in Higher Education. In Integrated Management. (pp. 566-572). Proceedings of the 6th International Conference on ISO 9000 and TQM. HKB: Paisley Business School.

Srikanthan, G., & Dalrymple, J. (2002). Developing a holistic model for quality in higher education. *Quality in Higher Education, 8*(3), 215–224. Routledge. Retrieved July 2, 2011, from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Developing+a+Holistic+Model+for+Quality+in+Higher+Education#0

Stephenson, J. (2005). Definitions of indicators of quality on the application of ICT to University Teaching. *Paper for workshop at Tarragona, Spain* (p. 20–35). Retrieved June 25, 2011, from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Definitions+of+indicators+of+quality+on+the+application+of+ICT+to+University+Teaching#0.

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a Successful e-learning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction. *Computers & Education, 50* (4), 1183–1202.

Suzuki, K. (2006). A layer model for e-Learning design. A paper presented at 22nd National Conference of Japan Society for Educational Technology, Kansai University, JAPAN [In Japanese].

Suzuki, K., & Keller, J. M. (May, 2007). Proposing a layer model for e-Learning design. A paper presented *International Conference on Blended Learning*, Florianopolis *CBL*, BRAZIL.

Suzuki, K., & Tada, N. (2009). A Layers-of-Quality Model in Online Course Design: The Five-E Model. *International Journal, 3*(1), 92–103. Retrieved June 18, 2011, from http://www.kaeim.or.kr/IJEMT3.93-104.pdf

Swedish National Agency of Higher Education (Högskoleverket). (2008). *E-learning quality: Aspects and criteria for evaluation of e-learning in higher education*. Stockholm: Swedish National Agency for Higher Education. Högskoleverkets rapportserie 2008:11 R. Retrieved May 25, 2011, from http://www.hsv.se/download/18.8f0e4c9119e2b4a60c800028057/0811R.pdf

Vettori, O., Lueger, M., & Knassmueller, M. (2007). Dealing with ambivalences – Strategic options for nurturing a quality culture in teaching and learning, *in Embedding Quality Culture in Higher Education. A selection of papers from the 1st European Forum for Quality Assurance, pp. 21-27.* Brussels , EUA http://www.eua.be/fileadmin/user_upload/files/Publications/EUA_QA_Forum_publication.pdf, accessed 28-01-2009.

Vinayagazundaram, B.& Srivasta S.K. (2007). Software Quality in Artificial Intelligence System. Information Technology Journal 6 (6), 835-542.

UNESCO/OECD. (2005). Guidelines for quality provision in cross-border higher education. Jointly elaborated by UNESCO and the OECD. Retrieved November 27, 2006, from http://www.oecd.org/document/52/0,2340,en_2649_34549_29343796_1_1_1_1,00.html

Vallabhaneni, S. (1990). *Auditing Software Development*, Chapman & Hall, NY.

Volery, T., & Lord, D. (2000). Critical success factors in online education. *International Journal of Educational Management*, *14* (5), 216–223. MCB UP Ltd.

Wanger, S., & Deissenboeck, F. (2007). An Intergrated Approach to Quality Modelling. *In Proceding 5th Workshop on Software Quality(5-WoSO)*. IEEE Computer Society Press.

Wagner, N., Hassanein, K., & Head, M. (2008). Who is responsible for E-Learning Success in Higher Education? A Stakeholders' Analysis. *Educational Technology & Society*, *11* (3), 26-36.

Wirth M.A. (2005). Quality *Management in E-Learning: Different Paths, Similar Pursuits.* Paper presented in 2nd International SCIL Congress. URL: http://www.scil.ch/congress-2005/programme-10-11/docs/workshop-1-wirth-text.pdf

Watty, K. (2003). When will Academics Learn about Quality? *Quality in Higher Education, 9* (3), 213-221. http://pdfserve.informaworld.com/948673715703498.pdf.

Zaharias, P. (2008). Cross-Cultural Differences in Perceptions of E-Learning Usability: An Empirical Investigation. *International Journal of Technology and Human Interaction (IJTHI)*, *4* (3), 1–26. IGI Global. Retrieved March 21, 2011, from http://www.igi-global.com/bookstore/article.aspx?titleid=2925

Zeiss B., Vega D., Schieferdecker I., Neukirchen H.& Grabowski J. (2007). Applying the ISO 9126 Quality Model to Test Specifications - Exemplified for TTCN-3 Test Specifications. Proceedings of Software Engineering, 2007 – Citeseerx http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.73.227

APENDICES

Appendix 5-1: Research Instrument (English version)

Survey of eLearning Quality and eLearning status in Palestinian Higher Education sector

This survey is part of a thesis research on "quality in e-learning for the Palestinian Higher Education Institutions (PHEIs)" under the direction of Assoc. Prof. Dr. **Labib Arafeh, Computer Engineering Department,** Al-Quds University-Jerusalem, Palestine.

The purpose of the research is to gain an overview of levels of awareness in the Palestinian Higher Education sector regarding the e-Learning and the Quality in e-Learning.

The result of the research will be used to develop a set of recommendations which will be included in a proposed quality model for the eLearning in this thesis to improve the quality of eLearning in Palestine.

This questionnaire is aimed at people who are involved with the development life cycle of e-Learning and/or quality in e-Learning in PHEIs, Faculty members who make use of, and HEIs' students. But if you are an expert not directly involved with any PHEI institution, your views would still be very valuable.

This questionnaire may take few minutes to complete. Completed questionnaire should be returned to Mohammed Harasheh as soon as possible, preferably no late than October 07, 2011.

All information supplied:

- Is confidential
- Is solely for the purposes of this research project
- Will not be shared with any third party
- Will be completely anonymous in the final report

Your participation is very much appreciated and will allow us to focus on critical issues related to eLearning and its quality in Palestine.

- Yours sincerely:
- Mohammed Harasheh
- Mobile 0599 111 319

Please complete all sections by placing checkmarks in the appropriate boxes and filling in the blanks for written answers.

Date:

Part 1: General Information

1.1 What is your institution type / name?

☐ University ☐ College
☐ Other Name (Optional):

1.2 What is your gender?

☐ Male ☐ Female

1.3 What is your age?

☐ Less than 25 year ☐ From 25 to 34 year
☐ From 35 to 44 year ☐ From 45 to 54 year
☐ More then 55 year

1.4 What is your primary role?

☐ Learner ☐ Teacher / Trainer
☐ Trainer administrator ☐ Designer / Developer
☐ Pedagogical expert ☐ Other Please specify

1.5 What is your Education?

☐ High school ☐ College
☐ Bachelors Degree ☐ Master Degree
☐ PhD ☐ Other Please specify

1.6 As a learner/trainer, what percentage of your learning is currently supported by technology?

☐ 0-10% ☐ 10-25%
☐ 25-50% ☐ More then 50%
☐ All of it

1.7 How do you rate eLearning initiatives in your institution?

☐ Poor ☐ Fair
☐ Good ☐ Very good
☐ Excellent

1.8 If you choose the way you learn, how much of it will be eLearning?

☐ None ☐ Little
☐ Some ☐ A lot
☐ All

Please rate your level of agreement with the statements in the following questions using the ollowing scale:
5 – Strongly Agree 4 – Agree 3 – Neutral 2 – Disagree 1 – Strongly Disagree
Only one selection for each statement

Institutional Factors

Please rate your opinion about institutional quality policy?

No	Question	Rating
1	Quality should be integrated into the corporation's vision.	1 2 3 4 5
2	The vision should be clearly communicated.	1 2 3 4 5
3	Policy should incorporate quality.	1 2 3 4 5
4	Quality projects should be given strategic priority.	1 2 3 4 5
5	Quality objectives should be clearly defined.	1 2 3 4 5
6	Students or learners should play a main role in the quality process.	1 2 3 4 5
7	Senior leaders communicate a clear vision.	1 2 3 4 5
8	The institution builds active relationships with students.	1 2 3 4 5

Pedagogical Factors

How much do you agree or disagree with each statement?

No	Question	Rating
1	The eLearning enables me to control my learning progress	1 2 3 4 5
2	I have some choices to select topics to be learned	1 2 3 4 5
3	eLearning attracts my attention to materials	1 2 3 4 5
4	I think eLearning could improve my performance in learning / job	1 2 3 4 5
5	I thing eLearning could improve my productivity in learning / job	1 2 3 4 5
6	It is easy and simple to use eLearning system	1 2 3 4 5
7	I can use eLearning system without written instructions	1 2 3 4 5
8	Interaction with the eLearning system was clear and understandable	1 2 3 4 5
9	I can contact the instructor easily	1 2 3 4 5
10	I enjoy working in groups	1 2 3 4 5

Technological Factors

Please tell us about your technology perspective for eLearning?

No	Question	Rating
1	I can access the internet easily from institution network	1 2 3 4 5
2	I did not experience problems while browsing	1 2 3 4 5
3	Browsing speed was satisfactory	1 2 3 4 5
4	I can access institution websites with same account /password	1 2 3 4 5
5	I can rely on the institution computer network	1 2 3 4 5
6	The institution website never crashed or 'froze up'	1 2 3 4 5
7	Overall, the information technology infrastructure is efficient	1 2 3 4 5
8	I can access the institution web site at any time from any where	1 2 3 4 5

Instructional Design Factors

Please tell us about the ID of the eLearning in your institution?

No	Question	Rating
1	Course and session objectives were clearly stated	1 2 3 4 5
2	The design clearly addresses learning outcomes	1 2 3 4 5
3	Clear and complete syllabus were provided	1 2 3 4 5
4	Assessments and examinations reflects the objectives	1 2 3 4 5
5	The interactions within the course were meaningful	1 2 3 4 5
6	The design should include questions, reviews, and summaries	1 2 3 4 5
7	eLearning system enables me to choose what I want to learn	1 2 3 4 5
8	The design is appropriate for different learners	1 2 3 4 5
9	The content of the course was presented in the right context	1 2 3 4 5
10	The length of the course was sufficient for the course	1 2 3 4 5
11	eLearning system is user-friendly	1 2 3 4 5
12	The screen layout was clear and pleasant	1 2 3 4 5
13	It was easy to navigate around the course	1 2 3 4 5
14	Feedback is timely and relevant	1 2 3 4 5

Content Factors

Please rate the contents of the eLearning course(s) you attended? Assessment tools?

No	Question	Rating
1	The content was up to date	1 2 3 4 5
2	Contents are sufficient, accurate, and clear	1 2 3 4 5
3	Contents are free of errors	1 2 3 4 5
4	Contents are well organized	1 2 3 4 5
5	The content of the program was at an appropriate level of detail	1 2 3 4 5
6	The content was presented and explained clearly	1 2 3 4 5
7	Content language is concise and clearly written	1 2 3 4 5
8	The content provided is easy to understand	1 2 3 4 5
9	Contents are easy to access and navigate	1 2 3 4 5
10	I perceive the design of the eLearning components to be good	1 2 3 4 5
11	Contents are interactive and keeps me interest	1 2 3 4 5

Cultural Factors

Please rate the presence of culture in the eLearning context?

No	Question	Rating
1	Contents are delivered in a language understood by learners	1 2 3 4 5
2	Support is in languages understood by all learners	1 2 3 4 5
3	The design is sensitive to cross-cultural issues	1 2 3 4 5
4	The design considers cultural and religious values	1 2 3 4 5
5	Symbols used were meaningful	1 2 3 4 5
6	Writing formats and styles were easy to understand	1 2 3 4 5
7	Contents avoids acronyms, and ambiguous words	1 2 3 4 5

Student Factors

Please tell us how do you feel about your study habits?

No	Question	Rating
1	eLearning encourages me to search for more information	1 2 3 4 5
2	eLearning encourages me to participate more in discussion	1 2 3 4 5
3	I enjoy using personal computers	1 2 3 4 5
4	I use computers to chat and send e-mails	1 2 3 4 5
5	I do read as well as participate in the discussion group	1 2 3 4 5
6	I think eLearning is a good idea	1 2 3 4 5
7	I learn better by eLearning system	1 2 3 4 5
8	eLearning enables me to choose when and where to study	1 2 3 4 5
9	I can choose how to study material	1 2 3 4 5

Instructors' Factors

Please rate the instructor(s) in your institution?

No	Question	Rating
1	The instructor is enthusiastic about teaching the class	1 2 3 4 5
2	The instructor's style of presentation holds me interest	1 2 3 4 5
3	The instructor is friendly towards individual students	1 2 3 4 5
4	The instructor handles the eLearning units effectively	1 2 3 4 5
5	The instructor explains how to use the eLearning components	1 2 3 4 5
6	We were invited to ask questions/receive answers	1 2 3 4 5
7	We were encouraged to participate in class	1 2 3 4 5
8	The instructor is active in teaching me the course subjects via eLearning	1 2 3 4 5
9	The instructor made the course material interesting	1 2 3 4 5

Support Factors

Please tell us your perspective about the institutional support?

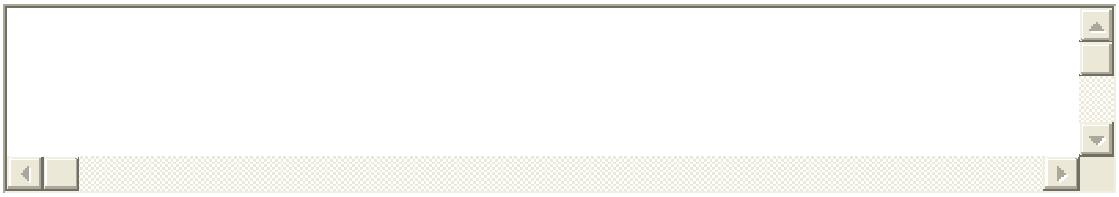
No	Question	Rating
1	Access to technical support staff is always available	1 2 3 4 5
2	Technical support staff shows interest in helping me	1 2 3 4 5
3	Technical support staff are willing to help me	1 2 3 4 5
4	I receive answers for my questions quickly	1 2 3 4 5
5	I received comprehensive course pre-joining instructions	1 2 3 4 5
6	I get adequate support for completing my courses	1 2 3 4 5
7	The eLearning components were available all the time	1 2 3 4 5
8	Technical assistance in course development should be provided	1 2 3 4 5
9	Pedagogical assistance should be provided to teachers/instructors	1 2 3 4 5
10	Instructor training should be a continuous process to support eLearning	1 2 3 4 5

Delivery Factors

Please tell us how do you rate the institution eLearning context?

No	Question	Rating
1	I can access the material all time	1 2 3 4 5
2	I can choose the time to study	1 2 3 4 5
3	I can use the eLearning system from any place	1 2 3 4 5
4	I can download material without any problem and quickly	1 2 3 4 5
5	I am satisfied with how easy it is to use this system	1 2 3 4 5
6	I can effectively complete my work using this system	1 2 3 4 5
7	It was easy to learn to use this system	1 2 3 4 5
8	I can recover quickly to operate the system after a failure	1 2 3 4 5
9	The students initiated most of the discussion	1 2 3 4 5
10	eLearning system provides content that exactly fits your needs	1 2 3 4 5
11	eLearning system provides useful content	1 2 3 4 5

Please write any comments or concerns that you may have here?



Thank you for completing the survey, your views and comments are appreciated.

Appendix 5-2: Research Instrument (Arabic version)

إستبيان حالة وجودة التعلم الإلكتروني في مؤسسات التعليم العالي في فلسطين

هذه الدراسة هي جزء من بحث أطروحة رسالة ماجستير حول "الجودة في التعلم الإلكتروني في مؤسسات التعليم العالي في فلسطين" تحت اشراف الاستاذ المساعد الدكتور لبيب عرفة، قسم هندسة الكمبيوتر. جامعة القدس، القدس ، فلسطين.

الغرض من هذا الإستبيان هو الحصول على لمحة عامة عن مستويات الوعي في قطاع التعليم العالي الفلسطيني بشأن التعلم الإلكتروني وجودة التعلم الإلكتروني.

سوف تستخدم نتيجة هذا البحث لتطوير مجموعة من التوصيات التي سيتم استخدامها في نموذج الجودة للتعلم الإلكتروني في هذه الأطروحة لرسالة الماجستير والتي ستؤدي الى تحسين نوعية التعلم الإلكتروني في فلسطين.

يستهدف هذا الاستبيان الأشخاص الذين يشاركون في تطوير مناهج ومحتويات التعلم الإلكتروني و/ أو الجودة في التعلم الإلكتروني وأعضاء الهيئات التدريسية وكذلك طلاب مؤسسات التعليم العالي والكليات المجتمعية. ولكن اذا كنت خبيرا أو ترغب في المشاركة في هذا الاستبيان فإن وجهات نظركم هي محل ترحيب وتقدير وقيمة للغاية لهذا البحث.

هذا الاستبيان قد يستغرق القليل من الوقت لإستكماله. يرجى من حضرتكم استكمال هذا الاستبيان وإعادته الى الطالب محمد هرشة في اقرب وقت ممكـن، ومن المفضـل ان يكون قبل تاريخ 07-10-2011

جميع البيانات في هذا الاستبيان:

- سرية
- سيتم استخدامها لأغراض البحث العلمي فقط
- لن يتم مشاركتها مع اية جهة اخرى
- النتائج في التقرير النهائي مبهمة وبدون اسماء
-
- إن مشاركتكم ووجهات نظركم هي موضع تقدير واحترام كبير. وستتيح لنا التركيز على القضايا الحرجة المتعلقة بالتعلم الإلكتروني ونوعيته ووجهات النظر الخاصة بجودة التعلم الإلكتروني في فلسطين.

للإستفسار يرجى الاتصال على:
محمد هرشة - مديرية نظم المعلومات - وزارة المالية
جوال رقم: 0599 111319

ارجو الاجابة عن جميع الاسئلة في هذا الاستبيان وذلك بوضع اشارة P أو دائرة في المكان المناسب و تعبئة الفراغات باجابات مكتوبة.

التاريخ :

الجزء الاول : معلومات عامة

1.1 **ما هو اسم / نوع مؤسستك ؟**

☐ جامعة ☐ كلية
☐ غير ذلك الاسم (اختياري)

1.2 **ماهو جنسك ؟**

☐ ذكر ☐ انثى

1.3 **كم عمرك ؟**

☐ أقل من 25 سنة ☐ من 25 الى 34 سنة
☐ من 35 الى 44 سنة ☐ من 45 الى 54 سنة
☐ أكبر من 55 سنة

1.4 **ما هو دورك في المؤسسة ؟**

☐ متعلم ☐ معلم / مدرب
☐ مدرب مسؤول ☐ مطور/ مصمم
☐ خبير تربوي ☐ غير ذلك (حدد من فضلك)

1.5 **ما هو مستواك التعليمي ؟**

☐ ثانوية ☐ كلية
☐ بكالوريوس ☐ ماجستير
☐ دكتوراة ☐ غير ذلك (حدد من فضلك)

1.6 **كمتعلم أو معلم ما هي النسبة المئوية لتعلمك / تعليمك الحالي المدعوم من الوسائل التكنولوجية ؟**

☐ أقل من 10% ☐ من 10% الى 25%
☐ من 25% الى 50% ☐ أكثر من 50%
☐ جميع المواد

1.7 **كيف تقيم مبادرات التعلم الالكتروني في مؤسستك؟**

☐ ضعيف ☐ متوسط
☐ جيد ☐ جيد جدا
☐ ممتاز

1.8 **أذا كان لديك الخيار في اختيار طريقة تعلمك كم ستحدد كمية التعلم الالكتروني منها ؟**

☐ لا شيء ☐ قليل
☐ البعض ☐ الكثير
☐ جميع المواد

أرجوا ان تقيم مستوى موافقتك على الاجابات الأسئلة التالية مستخدما المعايير التالي:
1) اعارض بشدة 2) غير موافق 3) لا رأي لي 4) موافق 5) موافق بشدة

الجزء الثاني: العوامل المتعلقة بالمؤسسة التعليمية

ارجو ان تقيم نوعية السياسة المتبعة في مؤسستك

الرقم	السؤال	التقييم
1	الجودة يجب ان تكون ضمن سياسة المؤسسة / الجامعة	5 4 3 2 1
2	رؤيا المؤسسة يجب ان تكون معلنة وبوضوح	5 4 3 2 1
3	استراتيجية المؤسسة / الجامعة يجب ان تتضمن خطة الجودة	5 4 3 2 1
4	المشاريع ذات الجودة العالية يجب ان تعطى اولوية	5 4 3 2 1
5	جودة الاهداف يجب ان تكون معرفة بوضوح	5 4 3 2 1
6	الطالب او المتعلم يجب ان يلعب دورا اساسيا في تحديد جودة العملية التعليمية	5 4 3 2 1
7	القياديون في المؤسسة / الجامعة يتواصلون من خلال رؤية واضحة	5 4 3 2 1
8	المؤسسة التعليمية تبني علاقة نشطة / فاعلة مع المتعلمين	5 4 3 2 1

الجزء الثالث : العوامل التربوية

ما هو مدى موافقتكم لكل من العبارات التالية

الرقم	السؤال	التقييم
1	التعلم الالكتروني يتيح لي التحكم بتقدمي في عملية التعلم	5 4 3 2 1
2	يمكنني اختيار بعض مواضيع التعلم التي ارغب بها	5 4 3 2 1
3	التعلم الالكتروني يشد انتباهي للمادة التعليمية	5 4 3 2 1
4	اعتقد ان التعلم الالكتروني سيحسن ادائي في التعلم / العمل	5 4 3 2 1
5	اعتقد ان التعلم الالكتروني سيحسن انتاجي في التعلم / العمل	5 4 3 2 1
6	من السهولة والبساطة استخدام انظمة التعلم الالكتروني	5 4 3 2 1
7	استطيع استخدام نظام التعلم الالكتروني دون الحاجة لتعليمات مكتوبة	5 4 3 2 1
8	التفاعل مع نظام التعلم الالكتروني واضح ومفهوم	5 4 3 2 1
9	استطيع التواصل مع المعلم بسهولة	5 4 3 2 1
10	استمتع في العمل ضمن مجموعات	5 4 3 2 1

الجزء الرابع: عوامل التقنية

ارجو ان تخبرنا عن وجهة نظركم في عوامل التقنية للتعلم الالكتروني

الرقم	السؤال	التقييم
1	استطيع الوصول للانترنت بسهولة من خلال الشبكة في المؤسسة / الجامعة	5 4 3 2 1
2	لم اواجه اية مشاكل اثناء عملية التصفح	5 4 3 2 1
3	سرعة التصفح مرضية	5 4 3 2 1
4	استطيع الولوج للموقع الالكتروني للمؤسسة / الجامعة من خلال حساب خاص وكلمة مرور واحدة	5 4 3 2 1
5	يمكنني الاعتماد على شبكة الحاسوب في المؤسسة / الجامعة	5 4 3 2 1
6	الموقع الالكتروني للمؤسسة لم يتوقف ابدا	5 4 3 2 1
7	بشكل عام البنية التحتية لتكنولوجيا المعلومات تتسم بالكفاءة	5 4 3 2 1
8	استطيع الوصول للموقع الالكتروني للمؤسسة في أي زمان ومن أي مكان	5 4 3 2 1

الجزء الخامس: عوامل التصميم التعليمي

ارجو ان تخبرنا بوجهة نظركم حول التصميم التعليمي للتعلم الالكتروني في مؤسستك / جامعتك ؟

الرقم	السؤال	التقييم
1	تم وضع اهداف المقرر والفصل الدراسي بوضوح	5 4 3 2 1
2	التصميم يعكس مخرجات التعليم بشكل واضح	5 4 3 2 1
3	تم وضع مناهج واضحة وكاملة	5 4 3 2 1
4	التقييم والاختبارات تعكس الاهداف التعليمية	5 4 3 2 1
5	التواصل والترابط داخل المقرر هادف وذات معنى	5 4 3 2 1
6	التصميم يجب ان يتضمن اسئلة، مراجعة وملخص	5 4 3 2 1
7	نظام التعلم الالكتروني يتيح لي اختيار ما اريد تعلمه من المادة التعليمية	5 4 3 2 1
8	التصميم يتناسب مع كافة المتعلمين	5 4 3 2 1
9	يتم وضع محتويات المقررات ضمن السياق السليم والصحيح	5 4 3 2 1
10	حجم المقرر والمادة التعليمية كافي	5 4 3 2 1
11	نظام التعلم الالكتروني سهل الاستخدام	5 4 3 2 1
12	تصميم الشاشات واضح و ممتع	5 4 3 2 1
13	من السهولة التنقل بين محتويات البرنامج الدراسي	5 4 3 2 1
14	التغذية الراجعة كانت تتم في الوقت المناسب وذات معنى	5 4 3 2 1

الجزء السادس : عوامل محتويات المادة التعليمية

ارجو تقييم محتويات مقررات التعلم الالكتروني التي حضرتها

الرقم	السؤال	التقييم
1	المحتويات التعليمية حديثة	5 4 3 2 1
2	المحتويات كافية ودقيقة وواضحة	5 4 3 2 1
3	المحتويات خالية من الاخطاء	5 4 3 2 1
4	المحتويات مرتبة بشكل جيد	5 4 3 2 1
5	محتويات البرامج مناسبة لمستوى التفاصيل	5 4 3 2 1
6	المحتويات التعليمية قدمت وشرحت بشكل واضح	5 4 3 2 1
7	لغة المحتويات موجزة ومكتوبة بوضوح	5 4 3 2 1
8	المحتويات سهلة الفهم	5 4 3 2 1
9	الوصول للمحتويات والتنقل بينها سهل	5 4 3 2 1
10	أرى ان تصميم المحتوى التعليمي يجب ان يكون جيدا	5 4 3 2 1
11	المحتويات تفاعلية وتبقيني مهتما (تثير انتباهي)	5 4 3 2 1

الجزء السابع : العوامل الثقافية

ارجو تقييم وجود الثقافة في سياق التعلم الالكتروني

الرقم	السؤال	التقييم
1	المحتويات تسلم / توزع بلغة مفهومة للمتعلمين	5 4 3 2 1
2	المساعدة تتم بلغة مفهومة للمتعلمين	5 4 3 2 1
3	التصميم حساس للقضايا الثقافية المشتركة بين المشاركين (المتعلمين)	5 4 3 2 1
4	التصميم يراعي القيم الثقافية والدينية للمتعلمين	5 4 3 2 1
5	الرموز المستعملة ذات معنى مفهوم	5 4 3 2 1
6	طريقة و نمط الكتابة سهلة الفهم	5 4 3 2 1
7	المحتويات تتجنب الاختصارات والكلمات الغامضة	5 4 3 2 1

الجزء الثامن : عوامل الطلبة

ارجو اخبارنا عن شعورك إتجاه عاداتك التعليمية

الرقم	السؤال	التقييم
1	التعلم الالكتروني يشجعني على المزيد من البحث	5 4 3 2 1
2	التعلم الالكتروني يشجعني على المزيد من المشاركة في النقاشات	5 4 3 2 1
3	استمتع باستخدام الحاسوب الشخصي	5 4 3 2 1
4	استخدم الحاسوب للمحادثة والبريد الالكتروني	5 4 3 2 1
5	اقرأ واشارك في حلقات النقاش	5 4 3 2 1
6	اعتقد ان التعلم الالكتروني فكرة جيدة	5 4 3 2 1
7	اتعلم بشكل افضل من خلال التعلم الالكتروني	5 4 3 2 1
8	التعلم الالكتروني يتيح لي اختيار اين ومتى سأتعلم	5 4 3 2 1
9	يمكنني اختيار الطريقة التي احب ان ادرس بها	5 4 3 2 1

الجزء التاسع : عوامل المعلم

ارجو تقييم المعلمين / المدربين في مؤسستك

الرقم	السؤال	التقييم
1	المعلم متحمس لتعليم الصف	5 4 3 2 1
2	اسلوب المعلم/ المدرب يحملني على الاهتمام ويثير انتباهي	5 4 3 2 1
3	المعلم/المدرب ودود لكل الطلبة	5 4 3 2 1
4	المعلم/ المدرب يعالج وحدات التعلم الالكتروني بكفاءة	5 4 3 2 1
5	المعلم / المدرب يوضح كيفية استخدام مكونات التعلم الالكتروني	5 4 3 2 1
6	المعلم / المدرب يشجع ويدعم الطلبة لطرح الاسئلة والاجابة على اسئلة اخرى	5 4 3 2 1
7	كاان يتم تشجيعنا على المشاركة في الصف	5 4 3 2 1
8	المعلم / المدرب نشيط في تعليمي مواضيع المقرر من خلال التعلم الالكتروني	5 4 3 2 1
9	المعلم / المدرب يجعل المادة ممتعة	5 4 3 2 1

الجزء العاشر: عوامل المساندة والدعم

ارجو اخبارنا عن وجهة نظركم حول الدعم من قبل المؤسسة

الرقم	السؤال	التقييم
1	يمكن الوصول الى موظفي الدعم الفني بشكل دائم	5 4 3 2 1
2	موظفو الدعم الفني يظهرون اهتمامهم لمساعدتي	5 4 3 2 1
3	موظفو الدعم الفني على استعداد للقيام بمساعدتي	5 4 3 2 1
4	احصل على اجابات لتساؤلاتي بسرعة	5 4 3 2 1
5	يتم الحصول على دورة شاملة قبل الانضمام للتعلم اللالكتروني	5 4 3 2 1
6	يتم الحصول على الدعم الكافي لاكمال المقررات المطلوبة	5 4 3 2 1
7	محتويات ومكونات نظام التعلم الالكتروني متاحة طوال الوقت	5 4 3 2 1
8	يجب توفير تقديم المساعدة الفنية اللازمة اثناء تطوير المقرر	5 4 3 2 1
9	يجب تقديم الدعم البداجوجي(التربوي) للمعلم	5 4 3 2 1
10	تدريب المعلم يجب ان تكون عملية مستمرة لدعم التعلم الالكتروني	5 4 3 2 1

الجزء الحادي عشر : عوامل التوصيل(تقديم المادة التعليمية)

ارجو اخبارنا عن رأيك في سياق التعلم الالكتروني في مؤسستك

الرقم	السؤال	التقييم
1	استطيع الوصول للمادة التعليمية طوال الوقت	5 4 3 2 1
2	استطيع اختيار وقت الدراسة	5 4 3 2 1
3	استطيع استخدام نظام التعلم الاكتروني من أي مكان	5 4 3 2 1
4	استطيع تنزيل المادة التعليمية بشكل سريع ودون معوقات	5 4 3 2 1
5	انا راضي عن سهولة استخدام النظام	5 4 3 2 1
6	استطيع اكمال تعليمي مستعملا النظام بكفاءة	5 4 3 2 1
7	كان من السهل تعلم استخدام النظام	5 4 3 2 1
8	استطيع إعادة تشغيل النظام بسهولة بعد فشل النظام	5 4 3 2 1
9	الطالب غالبا ما يبدأ المناقشات	5 4 3 2 1
10	التعلم الالكتروني يقدم المحتوى التعليمي الذي يلبي حاجاتي بشكل تام	5 4 3 2 1
11	التعلم الالكتروني يقدم محتوى مفيد	5 4 3 2 1

من فضلك كتابة أي ملاحظات او مخاوف لديك ؟

تعليقاتكم ووجهات النظر المقدمة هي محل ترحيب واحترام

وشكرا لكم على استكمال هذا الاستبيان.

Appendix 6-1: Statistics for CSF items as rated by respondents

Factor Name	Criteria	Q#	Item	Mean	Std. Deviation	Rank	Total Rank
Institutional	Vision	1	Quality should be integrated into the corporation's vision.	4.036	.937	5	6
Institutional	Vision	2	The vision should be clearly communicated.	4.355	.839	2	2
Institutional	Policy & strategy	3	Policy should incorporate quality.	4.278	.804	3	3
Institutional	Policy & strategy	4	Quality projects should be given strategic priority	4.355	.807	1	1
Institutional	Objectives	5	Quality objectives should be clearly defined.	4.270	.768	4	4
Institutional	Objectives	6	Students or learners should play a main role in the quality process.	4.006	1.034	6	8
Institutional	Leadership	7	Senior leaders communicate a clear vision.	3.515	1.151	8	43
Institutional	Leadership	8	The institution builds active relationships with students.	3.602	1.211	7	31
Pedagogical	Learner-Centered	1	The eLearning enables me to control my learning progress	3.837	1.127	3	18
Pedagogical	Learner-Centered	2	I have some choices to select topics to be learned	3.746	1.076	5	23
Pedagogical	Engagement	3	eLearning attracts my attention to materials	3.707	1.166	6	25
Pedagogical	Effectiveness	4	I think eLearning could improve my performance in learning / job	3.837	1.111	4	19
Pedagogical	Effectiveness	5	I thing eLearning could improve my productivity in learning / job	3.885	1.037	2	15
Pedagogical	Ease of use	6	It is easy and simple to use eLearning system	3.388	1.153	8	58
Pedagogical	Ease of use	7	I can use eLearning system without written instructions	2.985	1.265	10	89
Pedagogical	Ease of use	8	Interaction with the eLearning system was clear and understandable	3.379	1.113	9	59
Pedagogical	Collaboration	9	I can contact the instructor easily	3.509	1.154	7	44
Pedagogical	Collaboration	10	I enjoy working in groups	3.929	1.084	1	12
Technological	Accessibility	1	I can access the internet easily from institution network	3.402	1.309	2	54
Technological	Browsing	2	I did not experience problems while browsing	2.813	1.306	7	95
Technological	Browsing speed	3	Browsing speed was satisfactory	2.867	1.255	6	93
Technological	Security	4	I can access institution websites with same account /password	3.950	1.148	1	11
Technological	Reliability	5	I can rely on the institution computer network	3.136	1.307	4	84
Technological	Reliability	6	The institution website never crashed or 'froze up'	2.686	1.344	8	97
Technological	Effectiveness	7	Overall, the information technology infrastructure is efficient	2.947	1.248	5	90
Technological	Availability	8	I can access the institution web site at any time from any where	3.317	1.366	3	68
Instructional Design	Goal and objective	1	Course and session objectives were clearly stated	3.559	1.144	4	37

Factor Name	Criteria	Q#	Item	Mean	Std. Deviation	Rank	Total Rank
Instructional Design	Goal and objective	2	The design clearly addresses learning outcomes	3.547	.983	5	40
Instructional Design	Goal and objective	3	Clear and complete syllabus were provides	3.266	1.150	12	76
Instructional Design	Goal and objective	4	Assessments and examinations reflects the objectives	3.592	1.053	3	35
Instructional Design	Interaction	5	The interactions within the course were meaningful	3.672	1.037	2	26
Instructional Design	Interaction	6	The design should include questions, reviews, and summaries	4.036	.946	1	7
Instructional Design	Personalization	7	eLearning system enables me to choose what I want to learn	3.533	1.138	6	41
Instructional Design	Personalization	8	The design is appropriate for different learners	3.127	1.147	14	85
Instructional Design	Learning resources	9	The content of the course was presented in the right context	3.429	1.133	9	50
Instructional Design	Learning resources	10	The length of the course was sufficient for the course	3.396	1.159	11	57
Instructional Design	Interface design	11	eLearning system is user-friendly	3.482	1.143	8	47
Instructional Design	Interface design	12	The screen layout was clear and pleasant	3.408	1.127	10	52
Instructional Design	Interface design	13	It was easy to navigate around the course	3.497	1.122	7	45
Instructional Design	Interface design	14	Feedback is timely and relevant	3.172	1.237	13	81
Content	Accuracy	1	The content was up to date	3.281	1.218	7	73
Content	Accuracy	2	Contents are sufficient, accurate, and clear	3.228	1.129	9	78
Content	Accuracy	3	Contents are free of errors	2.825	1.071	11	94
Content	Organization	4	Contents are well organized	3.325	1.103	4	67
Content	Organization	5	The content of the program was at an appropriate level of detail	3.328	1.079	3	66
Content	Clarity	6	The content was presented and explained clearly	3.314	1.141	5	69
Content	Clarity	7	Content language is concise and clearly written	3.264	1.141	8	77
Content	Clarity	8	The content provided is easy to understand	3.305	1.163	6	71
Content	Ease of use	9	Contents are easy to access and navigate	3.349	1.128	2	63
Content	Ease of use	10	I perceive the design of the eLearning components to be good	3.953	1.030	1	10
Content	Interactive	11	Contents are interactive and keeps me interest	3.195	1.234	10	79
Cultural	Language	1	Contents are delivered in a language understood by learners	3.328	1.226	7	65
Cultural	Language	2	Support is in languages understood by all learners	3.565	1.009	4	36
Cultural	Cross-Culture	3	The design is sensitive to cross-cultural issues	3.399	1.003	6	55
Cultural	Religious	4	The design considers cultural and religious values	3.624	1.078	1	29
Cultural	Symbols	5	Symbols used were meaningful	3.592	1.061	3	34
Cultural	Writing styles	6	Writing formats and styles were easy to understand	3.615	1.092	2	30

Factor Name	Criteria	Q#	Item	Mean	Std. Deviation	Rank	Total Rank
Cultural	Globalization	7	Contents avoids acronyms, and ambiguous words	3.524	1.053	5	42
Student	Motivation	1	eLearning encourages me to search for more information	3.760	1.180	7	22
Student	Motivation	2	eLearning encourages me to participate more in discussion	3.772	1.139	6	21
Student	Technology competence	3	I enjoy using personal computers	4.101	.951	1	5
Student	Technology competence	4	I use computers to chat and send e-mails	3.852	1.189	4	16
Student	Interaction & Collaboration	5	I do read as well as participate in the discussion group	3.595	1.208	9	33
Student	Attitudes	6	I think eLearning is a good idea	3.896	1.102	3	14
Student	Attitudes	7	I learn better by eLearning system	3.651	1.197	8	27
Student	Flexibility	8	eLearning enables me to choose when and where to study	3.852	1.112	5	17
Student	learning style	9	I can choose how to study	3.911	1.173	2	13
Instructor	Attitudes towards students	1	The instructor is enthusiastic about teaching the class	3.101	1.245	9	86
Instructor	Attitudes towards students	2	The instructor’s style of presentation holds me interest	3.364	1.226	5	61
Instructor	Attitudes towards students	3	The instructor is friendly towards individual students	3.160	1.227	8	82
Instructor	Technical competences	4	The instructor handles the eLearning units effectively	3.314	1.144	7	70
Instructor	Technical competences	5	The instructor explains how to use the eLearning components	3.411	1.178	3	51
Instructor	Instructor role	6	We were invited to ask questions/receive answers	3.556	1.155	2	39
Instructor	Instructor role	7	We were encouraged to participate in class	3.559	1.107	1	37
Instructor	Teaching style	8	The instructor is active in teaching me the course subjects via eLearning	3.331	1.204	6	64
Instructor	Teaching style	9	The instructor made the course material interesting	3.408	1.247	4	52
Support	TEC Tangibles	1	Access to technical support staff is always available	2.751	1.281	10	96
Support	TEC Reliability	2	Technical support staff shows interest in helping me	2.905	1.231	9	92
Support	TEC Responsiveness	3	Technical support staff are willing to help me	3.095	1.219	6	87
Support	TEC Empathy	4	I receive answers for my questions quickly	2.923	1.256	8	91
Support	Student Before starting	5	I received comprehensive course pre-joining instructions	3.041	1.270	7	88
Support	Student during course	6	I get adequate support for completing my courses	3.175	1.169	5	80
Support	During learning	7	The eLearning components was available all the time	3.284	1.233	4	72

Factor Name	Criteria	Q#	Item	Mean	Std. Deviation	Rank	Total Rank
Support	Instructor technical	8	Technical assistance in course development should be provided	3.601	1.175	3	32
Support	Instructor pedagogy	9	Pedagogical assistance should be provided to teachers/instructors	3.784	1.147	2	20
Support	Instructor training	10	Instructor training should be a continuous process to support eLearning	3.973	1.140	1	9
Delivery	Accessibility	1	I can access the material all time	3.355	1.327	8	62
Delivery	Accessibility	2	I can choose the time to study	3.470	1.228	4	48
Delivery	Availability	3	I can use the eLearning system from any place	3.636	1.209	2	28
Delivery	Usability	4	I can download material without any problem and quickly	3.436	1.211	5	49
Delivery	Usability	5	I am satisfied with how easy it is to use this system	3.278	1.232	9	74
Delivery	Usability	6	I can effectively complete my work using this system	3.364	1.171	7	60
Delivery	Usability	7	It was easy to learn to use this system	3.497	1.087	3	46
Delivery	Reliability	8	I can recover quickly to operate the system after a failure	3.270	1.203	10	75
Delivery	Interactivity	9	The students initiated most of the discussion	3.148	1.141	11	83
Delivery	Inf. Quality	10	eLearning system provides content that exactly fits your needs	3.396	1.164	6	56
Delivery	Inf. Quality	11	eLearning system provides useful content	3.740	1.091	1	24

THESIS SUMMARY - ARABIC

نموذج هجين الجودة للتعلم الإلكتروني

إعداد: محمد زكي احمد هرشة

إشراف : د. لبيب عرفة

ملخص

تقوم العديد من مؤسسات التعليم العالي في الوقت الحاضر بتطبق التعليم الإلكتروني لتحسين جودة ونوعية التعلم .بالرغم من ذلك ، فقد اتسمت هذه التطبيقات بعدم وجود جودة في نوعية البيئة التعليمية المقدمة. هذا السبب كان المحفز الرئيسي لهذه الدراسة من أجل تطوير وتحسين جودة ونوعية التعليم الالكتروني في مؤسسات التعليم العالي. ويعتبر الهدف الرئيسي لهذه الأطروحة هو دراسة تحسين فاعلية وكفاءة التعليم الالكتروني في مؤسسات التعليم العالي الفلسطينية من خلال اقتراح نموذج الجودة للتصميم وتطوير وتنفيذ التعليم الإلكتروني.

تستخدم هذه الدراسة البحثية منهجية بحثية مختلطة لتحقيق الأهداف المرجوة من الدراسة. فقد تم استعراض الأدبيات المختلفة من أجل التعرف وإستكشاف خصائص الجودة ، نماذج الجودة في مجال التعلم والتعليم والتدريس. وتم جمع البيانات الخاصة بهذة الدراسة بعدة طرق منها الكمية والنوعيةعلى حد سواء. وتم تحليل البيانات باستخدام الإحصاء الوصفي والاستدلالي.

كانت الخطوة الأولى من هذه الدراسة استعراض الأدبيات لتحديد وتحليل مفاهيم الجودة بشكل عام والجودة في التعليم الالكتروني بشكل خاص .ويتضح من استعراض أدبيات جودة التعليم الالكتروني أن له معاني مختلفة وينبغي أن ينظر إلى التعليم الالكتروني من زوايا مختلفة ومن عدة مستويات. فقد تم أجراء مقارنة بين نماذج جودة البرمجيات وأسفرت هذه الدراسة عن تحديد نوعية النماذج التي تتبع النهج الهرمي وعوامل الجودة الأكثر أهمية التي من الممكن استخدامها في تطوير وتحسين التعليم الالكتروني .من هذه العوامل : الموثوقية والكفاءة والوظائف وإعادة الاستخدام . كما وتم مراجعة نهج إدارة الجودة المختلفة مثل ISO 9000, EFQM, MBNQA وتبين من خلال المراجعة ان هذه النماذج تقوم بالتركيز على الطالب ورضا العملاء مع التركيز على العوامل البشرية، والقيادية. كما وأنه ينبغي أن ينظر إلى الجودة باعتبارها أداة تحسين مستمر.

علاوة على ذلك فقد تم مراجعة الادبيات الخاصة بتحديد عوامل النجاح الحرجة للتعليم الالكتروني وتم استنباط مجموعة من عوامل النجاح الحاسمة من خلال مراجعة الادبيات مضافا اليها التحديات الراهنة والمستقبلية التي تخص التعليم الالكتروني. هذه القائمة من العوامل الحرجة مجموعة شاملة من العوامل التي نحتاج إلى الاعتماد عليها في بناء تعليم الالكتروني ناجح.

ومن اجل تحقيق الهدف الرئيسي لهذه الدراسة ، تم اقترح "نموذج جودة التعليم الإلكتروني" eLQM . هذا النوذج الهجين نموذج كامل يشمل جميع عمليات تصميم وتطوير التعليم الالكتروني ويقوم على دمج مجموعة من الخصائص المختلفة من عدة مجالات علمية. فهو مبني على النهج الهرمي من نماذج الجودة الخاصة بالبرمجيات ومناهج إدارة وتحسين الجودة كما ويعتمد على استراتيجيات التصميم التعليمي المبنية على نظريات التعلم المختلفة، وعملية المنحى والمنتج المنحى. "نموذج جودة التعليم الإلكتروني" يحتوي على 97 معيار لقياس الجودة مقسمة إلى 49 عامل فرعي. تنقسم هذه العوامل الفرعية إلى عشرة عوامل رئيسية .هذه العوامل هي : العامل المؤسسي ، العوامل التربوية ، والعوامل التكنولوجية ، وعوامل دعم الطلاب ، وعوامل دعم المدرس ، عوامل الدعم المختلفة للعملية التعليمية والعوامل الثقافية وعوامل محتوى المادة التعليمية ، وعوامل التصميم التعليمي وتصميم والتتطبيقات البرمجية وعامل التوصيل تقديم المادة التعليمية.

كما وتم بناء أداة البحث " الاستبانة" للتحقق من صحة مدى قبول "نموذج جودة التعليم الإلكتروني" المقترح من قبل ذوي الشأن بالتعليم الالكتروني مثل الطلبة والمحاضرون والمبرمجون ومصممي المواد التعليمية وغيرهم . أظهرت النتائج التحليلية أن توفير التعليم الإلكتروني ذي الجودة العالية يحتاج إلى الأخذ بعين الاعتبار مجموعة عوامل النجاح الحرجة. وأظهر تحليل المكونات الرئيسية PCA لعوامل النجاح العشرة التي يتكون منها "نموذج جودة التعليم الإلكتروني" تحديد أهمية ومساهمات كل من هذه العوامل العشرة في تطوير وتحسين جودة التعليم الإلكتروني. وتبين من هذا التحليل أن عامل التصميم التعليمي هو أهم هذه العوامل وكانت نسبة المساهمة لهذا العامل هي 12 ٪ بين جميع العوامل. هذا يعني ان اي تحسين في جودة عامل التصميم التعليمي يؤدي الى رفع جودة التعليم الالكتروني بما لا يقل عن 12%. يلي هذا العمل الاساسي للنجاع عامل محتوى المادة التعليمية وعامل الثقافة ولهما نفس الاهمية والمساهمة فزيادة جودة وكفاءة التعليم الالكتروني. وكان عامل النجاح الاساسي " العوامل التربوية" هو الاقل اهمية ومشاركة في رفع وتطوير كفاءة التعليم الالكتروني حيث اظهرت النتائج ان اهمية هذا العامل تكمن في تحسين الجودة هي 9 ٪ فقط. ومن النتائج المهمة التي اظهرتها هذه الدراسة هو مستقبل التعلم والتعليم في الجامعات الفلسطينية هو التعليم الالكتروني. حيث اظهرت النتائج ان 95 ٪ من المستطلعين أفادوا بأنهم سيستخدمون التعليم الالكتروني لدعم التعليم والتعلم الخاص بهم في المستقبل. هذه النتائج والآثار المترتبة على الطريقة التي تدار جودة التعليم الالكتروني ومعززة في مؤسسات التعليم العالي. هذه النتائج تظهر مدى اهمية تصميم وتطوير تعليم الكتروني عالي الجودة يزيد من كفاءة وفاعلية التعليم في الجامعات الفلسطينية والطريقة التي يجب ان تدار بها عملية التعليم الجامعي في المستقبل.

كما وتم اجراء تحليل لتقييم وضع وحالة التعليم الالكتروني في الجامعات الفلسطينية بناء على عوامل النجاح التي تم تعريفها واعتمادها لنموذج الجودة المقترح في هذة الرسالة. أظهرت نتائج هذا التحليل أن جودة التعليم الالكتروني في الجامعات الفلسطينية لا تزال في بداية مراحلها ولا بد من بذل مزيد من الجهد ووضع الخطط الاستراتيجية من أجل بناء وتقديم تعليم الكتروني عالي.

ويمكن القول بأن نتائج هذه الدراسة تعتبر مفيدة لمطوري التعليم الالكتروني والمؤسسات التعليمية من أجل تحسين جودة التعليم والتعلم والتدريب. وهذه النتائج في النهاية سوف تؤتي بنتائجا المفيدة على الطلاب حيث سيحصوان على تعليم عالي الجودة يلبي رغباتهم وطلباتهم. أما على المدى الطويل فإن هذه الدراسة هي جزء من تقييم وتطوير مستمر ودوري لنموذج جودة التعليم الإلكتروني المقترح في هذه الرسالة. علاوة على ذلك، يمكن اعتبار هذا النوذج كأساس أكاديمي لسلسة من الدراسات المستقبلية لبدء دراسات أخرى ذات صلة في مجال التعليم الالكتروني.