IMPROVING THE EFFECTIVENESS OF E-LEARNING IMPLEMENTATION IN THE SCHOOL OF ENGINEERING AT TRIPOLI UNIVERSITY

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A thesis submitted to the University of Huddersfield in partial fulfilment of the requirements for the degree of Doctor of Philosophy

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Dedications

I declare that this thesis is my own investigation, and is not being concurrently submitted in candidature for any other degree.

Thuraya Ali Kenan

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Abstract

The study is concerned with generating recommendations for the development of e-learning strategy at the School of Engineering at Tripoli University in Libya. They are based on the identified barriers to the successful e-learning implementation in the institution after the quantitative and qualitative analysis of the questionnaires developed using SmartSurvey software package. The barriers were classified in three main categories: technical, cultural and mismanagement. These barriers were compared with those from Middle East and North Africa (MENA) countries (as close culture) and UK (as international culture and developed country).

Then a SWOT (Strengths, Weaknesses, Opportunities, and Threats) model for the diagnostic of the current stage of e-learning performance in the institution is developed. The user-centred design and action research approach are used for the design, development and implementation of an e-learning package for a module studied by Year 4 students from School of Engineering at Tripoli University. The e-learning packages played a supporting role in the delivery of the chosen module therefore the blended learning approach contributed to the improvement of the quality for the teaching and learning processes.

A novel I-CUBE model which can be used for the development of teaching and learning activities in a digital era is proposed. The sources of information for the proposed model are: quantitative and qualitative analysis of the stakeholders answers; conclusions for the (SWOT) analysis; researcher's reflections of the design, development and implementation of the e-learning package, study of the relevant educational publications and researcher's personal experience. There are several common opinions about the factors influencing the successful e-learning implementation so it is possible to make correlations between the stakeholders' points of view and to construct the surfaces which are included in the I-CUBE model.

A set of institutional, pedagogical and technological recommendations for the development of e-learning strategy in the School of Engineering at Tripoli University are formulated. These are derived from the analysis of barriers and SWOT model related to the successful e-learning implementation in Libyan Higher Education Institutes (LHEIs). Also the aspects included in the proposed novel I-CUBE model for the development of teaching and learning activities, the researcher's personal experience as a student and lecturer at Tripoli University and as a PhD student at the University of Huddersfield in UK are also considered. The implementation of these recommendations will enable the enhancement of students' learning experience and staff satisfaction through technology-based education addressing the flexible and diverse learning community's needs.

List of publications

Kenan, T., Elzawi, A., Pislaru, C. & Restoum, M. (2015). “A Study on the Impact of ICT on Collaborative Learning Processes in Libyan Higher Education”. International Journal of Learning, Teaching and Educational Research, 10 (1), pp. 172-190. ISSN 1694-2116.

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Kenan, T., Pislaru, C. Othman, A. and Elzawi, A. (2013C). **“**The social impact and cultural issues affecting the e-learning performance in Libyan Higher Education institutes”. International Journal of Information Technology & Computer Science (IJITCS), 12(1), pp. 2091 – 1610. ISSN (Online).

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Elzawi, A. Kenan, T. Wade, S. & Pislaru, C. (2013B). “Exploratory Study of the Attitudes of Academic Staff in Libyan Universities towards the Role of the Internet”. ICITST-2013, London Conference -2013. 9- 12 Dec. 2013. Published In: Internet Technology And Secured Transactions (ICITST), 2013 8th International Conference . Page (S): 490 – 493. IEEE Catalogue Number: CFP13811-ART. ISBN: 978-1-908320-20-9. (Http://Ieeexplore.Ieee.Org/Xpl/Mostrecentissue.Jsp?Punumber=6745432). Digital Object Identifier: 10.1109/ICITST.2013.6750248. Copyright © 2013 by Infonomics Society, IEEE.

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Othman, A., Pislaru, C., Kenan, T. and Impes, A. (2013A) ‘Attitudes of Libyan students towards ICT's

applications and E-learning in the UK'. In: Proceedings of the Fourth International Conference on E-Learning (ICEL2013). : The Society of Digital Information and Wireless Communications (SDIWC). pp. 123-129. ISBN 9780985348397.

Elzawi, A., Kenan, T., Wade, S. and Pislaru, C. (2012) "Bridging the Digital Divide and Enhancing the Quality of Engineering Research in Libyan Universities". In: 6th Conference on Quality in Middle East, 30 Jan - 2 Feb 2012, Hamdan Bin Mohammed University, Dubai

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List of abbreviations

The original words	The abbreviations
Blackboard	BB
BRITISH COUNCIL PRESS RELEASE AGREEMENT	BCPRA
Cascading Style Sheets	CSS
Communications and Information Technology Commission	CITC
Computer Mediated Communication	CMC
Critical Success Factors	CSF
Face-to-face	F2F
Higher Education	HE
Higher Education Institutes	HEIs
Hyper Text Mark-up Language	HTML
Information Communication Technology	ICT
Institute of Higher Education Policy	IHEP
Learning Management Systems	LMS
Libyan Higher Education Institutes System	LHEIs
Malcolm Baldrige National Quality Award	MBNQA
Middle East and North Africa	MENA
Relational Database Management System	RDBMS
Rogers Model of Diffusion of Innovation	RMDI
Statistical Package for Social Science	SPSS
Structured Query Language	SQL
Total Quality Management	TQM
United Kingdom	UK
United States Dollar	USD
Virtual Learning Environment	VLE
World Wide Web	WWW

Chapter 1: Introduction

The quality of modern teaching and learning processes has been increased by using computers and digital technologies. There has been an educational shift towards e-learning which enables the use of information and communications technology and the inclusion of the internet in teaching and learning. E-learning enhances the learning processes by offering a different way of delivering education: flexible and easy to use. Many Higher Education Institutes (HEIs) have adopted e-learning for online courses or as a support for the face-to-face sessions (in blended learning approach). So students of all ages and abilities have the chance to learn anywhere, at any time and at their own pace. The potential benefits of e-learning for developing countries in general (and for Libya in particular) will be discussed in this thesis, since there has not been sufficient research into the evaluations or perspectives of e-learning usage among HE system in Libya. Despite the importance of e-learning in Higher Education (HE) and human development in Libya, the implementation or the performance of e-learning is still facing a number of challenges in Libyan HEIs. Those challenges can be summarized as follows: leadership support; strategy; ICT infrastructure; culture; lecturers; students and the expert technicians. This research aims to identify the factors affecting the implementation of e-learning in HE in Libya by considering the following aspects related to the stakeholders in HEIs: attitudes towards e-learning, philosophies and beliefs about e-learning, satisfaction with technology and the e-learning experiences.

In Libyan e-learning backgrounds there has been a major emphasis of e-policies, where it has the potential to achieve a vital role in re-developing the Libyan HE (LHE) system and supporting the stakeholders (students, lecturers and technicians). This thesis aims to present selected descriptive findings and digital results from a case study passed out at Tripoli University- School of Engineering on experiences with and observations of the ICTs application usage and e-learning between the students, technicians and the lecturers. The stated findings are centered on participants' attitudes regarding to their satisfaction with technology-skills; then, concludes with a suitable strategy model on the projections of e-leaning in Libya.

This strategy project aims to appreciate and to investigate the improvement of e-learning performance in LHEIs via SWOT model results (with emphasis on Tripoli University); and its relevance to possibly help the LHEIs in the development of a marketing action plan aimed at promoting and at improving acceptance of e-learning.

This research has adopted a phenomenological philosophy and has used multiple tools. The relevant data was collected using different sources of evidence such as questionnaires and open- ended comments, and the researcher's own experience. The SPSS software program version 21 was employed to analyse the collected data. The research process allowed the researcher to combine those factors that were consistent with the literature and also some factors emerging from the empirical work. Thereafter, the SWOT model for the study, developed and adopted in the research findings was utilised to develop a set of recommendations to implement a suitable e-learning strategy linked with the I-Cube model in School of Engineering at Tripoli University and then in the LHEIs as general.

The justifications that encourage the following contributions to knowledge have developed from this

research, which includes: absence of strategy; poor communications skills which encompass poor knowledge of English Language among staff members and poor knowledge of computer literacy especially among old-generation staff members. These factors have not been identified in any of the previous literature. In addition, the findings of this research strengthen the existing literature on e-learning in HE and reduce the gap in knowledge applying to Libyan studies, and will help the Libyan HE Ministry and Universities Colleges to determine a procedure for e-learning implementation.

1.1 Libyan's readiness for e-learning

Currently and after the conflict in Libya, there have been many important impacts on infrastructure and the HEIs. The BBC News Channel presented a completed film depicting the results of the war in Libya, which was recorded during 2011 and 2012. This film reported that more than 3/4 million Libyans were living outside the country; up to 13,500 were dead; more than 25,000 were missing and between 35,000 and 50,000 were wounded (BBC_Ara.news, Feb. 2012).

Numerous policy makers have advertised on the destruction value in the Libyan infrastructure. Jibril (2012) declared on many media channels that Libya needs more than $480 million to restore its infrastructure, which was completely destroyed during the war. He led the team who drafted and formed the Unified Arab Training manual. He later took over the management and administration of many of the leadership training programmes for senior management in Arab countries (including Bahrain, Egypt, Jordan, Kuwait, Libya, Morocco, Saudi Arabia, Tunisia and the United Arab Emirates. (Library of Congress; 2012).

Rhema (2013) noted the impact of the armed conflict on LHEIs, in addition to the great risk and danger to the lives of people around the world. The most prominent effects of these conflicts are: loss, injury, insecurity, displacement, dislocation of family and community life, and psychological trauma. These effects are also depriving students of opportunities for education that could transform their lives and spear-head sustainable development of Libya. Considerable historical evidence has confirmed that incidents of armed conflict are reversing educational gains made over many years. Short incidents of violence lead to large setbacks and regression, as was the case in Rwanda, Iraq and Afghanistan (UNESCO, 2011).

The impact of the armed conflict in Libya is reflected on HEIs at the moment and reviews suggest that there are major challenges to be faced following the 2011 armed conflict, which left the country in a dismal state and forced it to "start from scratch" in building up its infrastructure and services. One of the challenges is the reconstruction and redevelopment of the country's education system. Most of the educational institutions in the affected areas have lost their infrastructure and resources. These losses must be replaced with an up-to-date educational infrastructure to enable a revival of the Libyan education system (Rhema, 2013).

In contrast, other Arabic countries are looking to develop their e-learning systems into M-learning systems, which have more flexibility in usage. Nowadays, the usage of mobile technology is a 21st Century skill that students and staff must seek to investigate. Due to the increase in mobile technology users, learners will demand course materials be delivered using mobile technologies which can be accessed from anywhere and at any time.

Al-Shawwa (2012), the Arab Advisors Group senior research analyst, noted, "*Saudi Arabia has been ranked as the Arab world's most competitive cellular market*". Table1.1 presents the percentages of 19 countries, and reflects the awareness and use, within Arabic countries, of the new technology of the 3G phone. Also, it provides evidence for the effect of the war on Libya in 2011 and 2012. The population of Libya in 2012 was less than 4.5 million, and the high cost, in such difficult circumstances, meant that most people did not care about buying new mobiles; nevertheless, some people did buy them from Egypt and Tunisia.

Table 1.1: Results of Arab Advisors Group's Cellular Sales (Al-Shawwa, 2012)

Name of country	The percentage	Name of country	The percentage
Saudi Arabia	74.56%	Sudan	56.72%
Jordan	70.67%	Mauritania	55.63%
Palestine	70.43%	Yemen	55.19%
Egypt	**67.86%**	Kuwait	52.58%
Oman	67.01%	UAE	49.01%
Morocco	64.20%	Qatar	47.14%
Iraq	62.45%	Syria	39.75%
Tunisia	**61.13%**	Lebanon	38.84%
Bahrain	61.01%	Libya	32.68%
Algeria	58.91%		

1.1.1 The background on Libya's need for e-learning

Libya is an African country, it is rich in oil and is considered a small population sample compared to the vast surface area (you can find out more details on Libya from the second or third chapter). Libya is always seeking to develop in all areas and access to the prosperity of the developed world counterparts. E-learning is a leap in the field of advanced education; it opens new horizons for all other institutions such as: the e-government, e-health and e-business in the country into the development and opening up to the world.

Most Libyan universities are located in large and seaboard cities, which is considered one of the difficulties that face students when joining the university. Huge numbers from the enrolled postgraduate students are living in different locations that are far from their universities. From the personal experience of the author of this thesis, there are many difficulties, such as accommodation or transportation and time management, which are faced by the postgraduate students because of these great distances. This led to these universities being required to accept huge numbers of students beyond their capability to attract them, causing an overcrowded or overfull educational environment.

1.1.2 Libya's need for e-learning from a strategic view:

Libya is an African country (see Figure 1.1) which mediates the countries of North Africa; It has a long beach about 1700 Km (Foreign travel advice-Libya; 2015), that caused several problems due to illegal immigration with the countries of Europe. Through strategies provided by this research, the disadvantages can be turned into advantages and features for e-learning to succeed and create an investment chance via the HEIs in Libya.

Libya is currently is a member in Middle East and North Africa (MENA) Programme group, which is undertaking high-profile research and projects on political, economic and security issues affecting these countries.

MENA Programme runs a variety of discussion groups, roundtable meetings, workshops and public events which seek to inform and broaden current debates about the region and international policy; produce a range of publicly available reports to development the infrastructure (MENA Programme, 2012).

Figure1.1: The place of Libya in Africa. (Google map).

1.2 The aim and objectives

The main aim of the study was to generate recommendations for the development of e-learning strategy at the School of Engineering in Tripoli University Libya so the effectiveness of the e-learning implementation is increased. They have been based on the barriers identification and SWOT analysis of the e-learning performance in LHEIs. The main aim of this study is to create a solution to improve the effectiveness of e-learning implementation in the Engineering School at Tripoli University.

The objectives of this research project are:

-To investigate the HE stakeholders (lecturers, technicians, students) perspectives about the barriers for successful e-learning implementation at the School of Engineering in Tripoli University Libya;

-To execute the SWOT analysis of the current stage of e-learning performance the specified institution;

- To design, develop and implement an e-learning package as support for the face-to-face sessions of a computer programming module by using the action research and blended approaches;

- To analyse the existing methods for the development of teaching and learning activities in a digital era and the links between learners' skills gained from school based learning activities and employability skills required by industry;

-To assist the responsible people to make a strategic plan for e-learning implementation in the School of Engineering at Tripoli University in Libya.

1.3 Research problem

The Libyan Department of Education has emphasized that ICT is creating new ways of learning and has the potential to enhance the management, and improve the level, of education in Libya (Al-badree, 2007). There has been an increase in the number of learners in Libya who have enrolled for distance learning with different universities, institutes and colleges where the courses are delivered through e-learning (Al-teer, 2006).

E-learning is becoming one of the most common means of using ICT to provide education to learners both on and off campus. It is argued here that previously disadvantaged higher education institutions in Libya, which have not been well resourced, are now confronted with a lack of the necessary resources to support e-learning. In fact, e-learning requires more than just technology to be successful, there is also the need for academic professionals well trained in ICT, who are capable of using e-learning systems and developing learning materials that address the needs of Libyan learners. Locally based technicians are also needed to maintain equipment and e-learning systems and tools.

E-learning crosses national boundaries, and for Libyan HEIs to compete on an equal footing with other countries on e-learning, there must be a successful integration of e-learning into Libyan HE. This can only be achieved if the barriers hindering the introduction and success of e-learning, particularly the provision of appropriate technologies, are overcome.

1.4 The hypotheses of research

The hypothesis is based on the researcher's point of view of the Engineering School at Tripoli University as a special case, and in the LHEIs as general.

1. Absence of strategy; poor communications skills, which involves poor knowledge of the English Language among staff members and poor computer literacy.
2. Weakness of the relationship between the lecturers and the technicians, especially among old-generation staff members.

1.5 Research questions

1. What are the advantages of e-learning that relate to its practical implementation on the stakeholders at Tripoli University?
2. Does exposure to an e-learning environment improve students' thinking skills?
3. What are the cultural elements that affect students' attitudes toward e-learning methods?
4. What are the barriers to e-learning implementation in Libya?
5. How would we build a new strategy for Tripoli University?

1.6 The study population

There were three categories of the study population considered in this research project: lecturers, technicians, and students (undergraduate students from School of Engineering at Tripoli University and Libyan post-graduate students studying at Universities from United Kingdom). It was useful to compare the feedback from the students who have never left Libya with those mature people (lecturers at Libyan Universities) who have the chance to study for Master or PhD degrees in an advanced country like UK (with good quality ICT infrastructure, modern practices and sophistication in HE).

The School of Engineering at Tripoli University has several departments: Electrical and Electronic; Civil; Chemistry Engineering; Control; Mechanical. Hence, the findings, results and the applications of the study might be simplistically generalized to the wider population in the other Schools from Tripoli University.
However they should not be generalised for the wider academic population across Libya without further study. Likewise, the results of study cannot be applied globally to other Arabic academic contexts, or to international academic backgrounds, because the findings are believed to be relevant only to the Libyan education environment.

1.7 Research contribution

The literature review of the existing publications has revealed a limited number of papers related to the e-learning development in Libya, which may position this research project as a valuable addition to the field of e-learning development in Libya.
The existing papers and dissertations discussed about the barriers to e-learning implementation in Libyan HEIs but none has presented a comprehensive classification in three categories (technical; cultural and mismanagement barriers). This research presented the details of each category according to the opinions of HE stakeholders (the lecturers; the technicians and the students) from School of Engineering in Tripoli University). The results of quantitative and qualitative analysis of their answers have been used to develop a novel model called (I-Cube) for the design of teaching and learning activities including e-learning

packages. Additionally, this research project identified the factors which possess relative strength in affecting e-learning adoption and improvement it in the LHEIs.
The previous papers depicted SWOT analysis; such as Rhema& miliszewska in 2010 and Artemi in 2009; who are focused on the technical challenges to e-learning implementation in Libyan HEIs. They are not presenting the mismanagement barriers as Weakness or Threats thought SWOT analysis model totally. This research project presented the SWOT analysis for the institutional, pedagogical, cultural and technical aspects of e-learning implementation in School of Engineering at Tripoli University in Libya.
This research addresses an issue that is believed critical, and would provide a guide as to how LHEIs can involve and occupy more effectively in e-learning, through the thesis' strategy, and overcome the barriers that face the e-learning improvement performance.

1.8 Outline of Thesis

Chapter One - explains the significance of this study, the aim and objectives, outline the research problem, questions and hypotheses; and the readiness of the Libyan HEIs to the e-learning implementation.

Chapter Two - presents the conclusions of the literature review related to this study; the definitions, adoption and evolutions' performance of e-learning in HE, in addition to presenting the development it within the theories and the models which effect learning and e-learning as Bloom taxonomy and Salmon model.

Chapter Three - provides a critical review of several case studies regarding the effectiveness of development on e-learning performance and contextually analyse them for the development of e-learning packages, and how this depended on the institutional, pedagogical and technological context.

Chapter Four - discusses the research methodology that was used in this study: research philosophy, design, justification for the selection of research method, the participants and settings, instrumentation. Also it will present the design of questionnaires considering the reliability, validity, bias, ethical issues and researcher's reflexivity.

Chapter Five - identifies the barriers related to the successful e-learning implementation in Engineering School at Tripoli University. The quantitative analysis of the LHEIs stakeholders (lecturers, students and technicians) answers was performed using Excel and the SPSS.

Chapter Six - diagnoses the SWOT model of the current stage of e-learning performance in the Engineering School at Tripoli University. SWOT analysis results have been used to formulate suggestions for the implementation of e-learning strategy in the Engineering School at Tripoli University in Libya.

Chapter Seven - describes the details of the proposed novel I-Cube model, which can be used for the development of teaching and learning activities. It will also present an analysis of the relation between the lecturers and technicians using SPSS to find the signification different between them to investigate the hypotheses of this research. The chapter contains the qualitative analysis of the answers provided by lecturers, technicians and students to the open-ended questions included in questionnaires. I-Cube model

shows the links between the main stakeholders in the HEIs: lectures, technicians and students, and the main considerable elements to preparing and development the teaching and the learning activities.

Chapter Eight- presents a set of recommendations for the development of e-learning strategy in the School of Engineering at Tripoli University. These have been derived from the analysis of barriers and SWOT model related to the successful e-learning implementation in LHEIs. Also the aspects included in the proposed novel I-Cube model for the development of teaching and learning activities.

Chapter Nine - contains the conclusions, contributions of knowledge and recommendations for future work.

The appendixes A, B and C contain on the different questionnaires. While the Appendix D included the Module Specifications for the Matlab course (case study of research). Appendix E included the questionnaire for user evaluation for the proposed e-learning package; and Appendix F included the Design, development and implementation of an e-learning package at the School of Engineering in Tripoli University. Finally; Appendix G present the academic biography of this thesis researcher.

The thesis's chapters are divided into theoretical, analytic and have been connected as following the structure in figure 1.2.

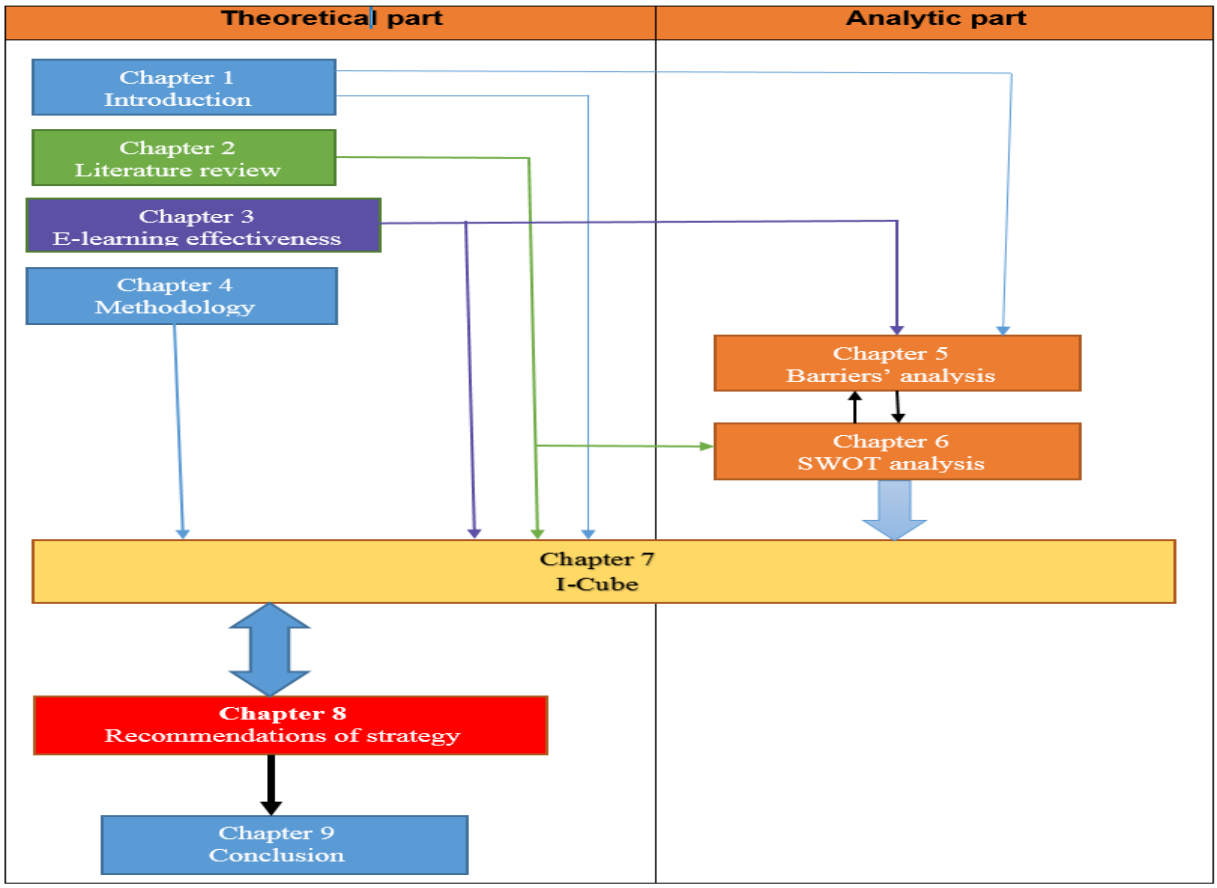


Figure 1.2: The structure of thesis

1.9 Chapter summary

This is an introductory chapter that presented a brief overview of e-learning. It has also discussed why e-learning might be needed in Libya, why there is a need for a strategy that aids e-learning adoption in LHEIs, and discussed the current status of Libya's e-readiness. This chapter also demonstrated the focus of the research, research aims and objectives, research problem, research contribution, the research questions, outline of chapters, and then provides the structure of the thesis.

Next chapter presents to conclusions of the critical review of the publications related to e-learning.

Chapter 2: Literature review of the e-learning

Firstly, this chapter shall focus on discussing what is meant by e-learning, and how the definition of e-learning has been developed up until the present day. Secondly, it shall discuss opportunities and limitations related to e-learning; e-learning in Higher Education and how we can benefit from it.

This chapter also relates two of the most common models that might be applied to the adoption of technological innovation and investigates the stages through which technological innovation can happen. It is argued that the power of societies is highly affected by its stock of knowledge and how effectively they can use this knowledge in order to create new knowledge (Bennett, et al., 2008).

Bhalalusesa et al., (2013) have indicated that the traditional learning style is delaying the presentation of knowledge in the modern era. Therefore the internet applications can be included in a successful way into blended learning, e-learning and m-learning approaches which are employed in this digital era of education (Elzawi et at., 2013B).

Ruttenbur et al (2000, p15) write that, *"Keeping up with new information and knowing how to use it are "mission critical" activities to businesses and individuals alike in a market where competition is no longer characterised by the big beating up the small, but rather by the fast running past the slow"*. They also defined training and education as: "*giving people the information and skills they need to compete effectively in the marketplace"*. They also emphasise that education and training institutions need to understand this definition of training and education in order to be able to provide ways of qualifying individuals with enough skills to cope with the demands of today's society. In addition, they argue that many traditional learning methods are not suitable for today's fast growing knowledge driven economies.

This thesis shall focus on e-learning development in HE in Libya. There is evidence that Libya is still in the fundamental stages of e-learning adoption, thus, it is important to investigate the factors affecting e-learning development, as suggested through authors from countries who are more experienced in the adoption of e-learning. The aim of this review is to become knowledgeable with the guidelines and paths of where and how to explore e-learning development factors in Libya. This review makes it possible to develop a framework for investigating the factors that could enable a more effective e-learning implementation in LHEIs.

2.1 The E-Learning definition

E-learning is one of the educational outcomes that has surfaced from the development of ICT. Its general concept is essentially learning which involves the usage of any electronic device, from computers to mobile phones, and which might, or might not, involve the usage of the internet (Web sites+ other applications) or an intranet (Local network system).

E-learning could be presented through several resources, for example: computer software and internet websites. Moreover, other applications have been developed specifically for e-learning, such as Virtual Learning Environments (VLEs), which provide the user or the learner with numerous facilities like

comfortable access to learning materials, communication with lecturers or trainers and the other peers. The VLE provides flexible access to learning, as it can be accessed anywhere and anytime (Adam & Healy, 2000). There are many authors who have a positive view of e-learning. One such example is Ruttenbur et al, who describe e-learning as "*the use of networked technology that will make the revolution possible*". Ruttenbur et al further argue that e-learning will play a critical role in changing the way we work and live. Ruttenbur et al (2000).

However, some other studies provided the following declarations to describe and identify the idea of e-learning. The European Commission (2001) describes e-learning as: "*The usage of new multimedia technologies and the Internet to develop the quality of learning and teaching by easing access to facilities and services in addition to remote exchanges and collaboration"* (The European Commission, 2001). The Joint Information Systems Committee (JISC) offered a parallel definition in 2003, defining e-learning as "*learning facilitated and supported through using the information and communications technology (ICT)"* (JISC, 2003). Likewise, Clark & Mayer (2003) have indicated that e-learning is the instruction delivered on a computer by way of CD-ROM, internet or intranet with the next qualities: containing content relevant to the learning objective; using instructional methods which include the examples and practice to support learning; using the media elements for example words and pictures to transport and deliver the contents and methods also, building fresh knowledge and skills linked to individual learning goals or to improved organizational performance. Clark & Mayer (2003)

Stockley (2005) has defined e-learning as "*the delivery method of a learning, training or education program by electronic means, e-learning is involving the usage of a computer or electronic device (e.g. a mobile phone) to provide training, or learning material*".(Stockley, 2005). Also, Oblinger and Hawkins (2005) suggest that e-learning has transformed from being a completely online course to use technology to deliver selected parts or all of course, independent of a fixed place or time. This means that students can be domestic, traveling or can learn at any distance (Oblinger and Hawkins, 2005).

Nevertheless, there are differences of view regarding the definition of e-learning from other professionals working in this field, such as Dublin & Cross (2003) and Oblinger and Hawkins (2005) who demand that there is no definition accepted by all researchers. In the opinion of Oblinger and Hawkins, "everybody knows what you mean when you talk about e-Learning: however, the term e-learning means different things to different people" (Oblinger & Hawkins, 2005). Also, Heinze and Procter and Zemsky & Massy in 2004 addressed the same point, adding, *"Yet, the e-learning is a concept in search of consistent definition".* They argued that it is difficult to find a commonly accepted definition of e-learning (Zemsky and Massy (2004).

In summary, new technologies, including computer networks, interactive-media, digital technologies, and the internet significantly increase the reach of e-learning provision. It enables and allow students to connect and interact with each other, and with their teachers, at any time, and it has opened up a universal market. Thus, many institutions have been attracted to e-learning systems and the e-learning market has grown continuously (Harun, 2001). In 2003, industry analysts situated the size of the e-learning market at 3 billion USD in the United States alone; the number grew to almost 15 billion USD by 2005, 18 billion USD in 2010,

and it is expected to reach 24 billion USD by 2015 (Adkins, 2013).

Carayannis (2015) described the advantages of using e-learning systems in modern educational institutions. E-Learning, in comparison with traditional learning, significantly reduces the time needed to locate information. It also offers access to online resources, databases, periodicals, journals and other material. If a student has trouble understanding part of the coursework, finding tips on the matter couldn't be easier than having immediate access to supplementary, unlimited and mostly free material online. Those characteristics can potentially maximize the time spent actually learning rather than looking for information; this is the first benefit from the e-learning. Also, there are numerous benefits such as the cost of training; the speed to use the education packages faster without waiting for a training representative. Also, can provide feedback on training immediately.

This suggests that e-learning offers a wide range of opportunities that need exploring and thus the proposition is that e-learning can be defined through three broad domains:

E-learning is a distance education method:

Most of the authors working in this field have accepted that the conceptual idea of the term e-learning indicates distance education or education delivered online.

E-learning is transactions facility on the web:

Some writers have highlighted that the facilities offered via the Learning Management Systems (LMS) exemplify a second e-learning big success. The LMS proposal is an extensive set from the options and communication tools to service the lecturers and their students' interactions and implement daily activities that help improve the learning process.

E-learning is electronically facilitated learning:

This domain relates to the material of e-learning courses itself, rather than the electronic system, whereas it focuses on the material design of the e-books, CD-ROMs and Web sites, to assessment and electronic tests. Even though there are natural differences in all of those tools, they are all mediated electronically (Zemsky and Massy, 2004).

This thesis could give a brief definition for e-learning from the conclusion that most of the definitions imply, which focuses on the means of delivery, but not on the process of learning. Those definitions viewed e-learning in terms of its numerous delivery options, but missed the learning process situation.

However, the definition put forward by the Council of the open and distance learning quality did not ignore the learning process situation; whereas the definition was included the word created, in the sentence "*effective learning process created*..." means that the learning takes place. On the other hand, most the types of services and support tools could be provided in an e-learning system; whereas, the outcome may not be learning.

From this argument, e-learning may be named [e-education]; but it might not be defined as e-learning as the process of interaction with electronically mediated education materials; except or unless the learning takes place. Where there is a focus on the learning process rather than the meaning of delivery, this thesis is accepting the definition formed by Mason and Rennie since 2006, which is as follows: "the e-learning is the effective learning process created by combining digitally delivered content with (learning) support and services". (Mason and Rennie, 2006, p.13-15).

2.2 The adoption of e-learning:

The progression of e-learning adoption is not simple operation; there are many positive factors that must be provided before; such as:

- The positive attitudes of the institution.
- The perceived helpfulness in adopting this system.
- The perceived effortlessness and the comfort of using the system.
- The readiness of the team in the institution; of the users and the staffs in terms of technology usage access and cultural evaluation.

Also, the e-learning adoption process may be considered a diffusion of innovation. Whereas, there are numerous other the models, which have been established to clarify and explain this, these models are designed especially to indicate in what way the new technology innovations are accepted and adopted.

The process of e-learning adoption in the HEIs includes numerous points and different influences, including: the social cultural, interpersonal and the organizational factors (Stephenson, 2001). There is a similar opinion, which concludes that attitudes have a significant and an essential direct influence on meaning and the goals to adopt e-learning, whereas attached to perceived helpfulness, benefits outcomes, ease of usage and the security of the system (Salmon, 2011).

This section will discuss the common descriptions of e-learning and demonstrate the process of Diffusion of Innovation Model for Rogers Model (1995).

2.3 E-Learning performance in higher education in general:

Through starting to recognise e-learning as an additional means to access learning, many higher education institutions (HEI) are adopting e-learning to meet the rapid growing demands on higher education (Khan, 2001).

A strong relationship between Khan in 2001 and Salmon in 2011 has been suggested that in the recent years have seen a melodramatic increase in both the uptake of e-learning within higher education and research into its influence for institutions, the practitioners or teachers, and the learners or students (Salmon, 2011, p. 22). Since 2000, most of the HEIs in the UK managed at minimum one form of virtual learning environment (VLE) systems (Schwartzman, 2001).

In 2003, Lepori et al reviewed a report, which examined the introduction of e-learning in 24 universities across Europe. They found that most of these universities accept e-learning primarily to support their students, and further found that the courses which have been taken on campus must accordingly improve the quality of the e-learning service delivered to the students. (Lepori et al., 2003)

This presented study was designed to determine the effect of the quick spread of e-learning in both face-to-face (F2F) on campus and distance education, which is still integrating with the organizational and educational systems of higher education institutions. Yet, it has not changed the fundamentals of the institutions, since most HEIs adopt ICT not in accordance with a general strategy that they should reconvert to e-learning, but rather with a more logical approach towards suitable technology that is introduced to

respond to clearly identifiable needs or opportunities (Lepori et al, 2003). The HEIs supervise to apply e-learning applications to primarily support F2F learning on campus. It could be concluded that in HEIs, e-learning act more like a support tool than another tools to access learning. While there are plenty of universities offering high quality e-learning courses, it appears that the emphasis of e-learning operation is more on learning support than in providing general learning.

In brief, until now the HE in most developing countries is still generally weak, as most HEIs suffer deficiencies in their infrastructure and resources (Sehrt, 2003; Andersson & Grönlund, 2009). Also, well trained and qualified lecturers are required to pass out the development and to do the changing (Dublin & Cross, 2003). However, active participative students, conversant with interactive learning (Andersson & Grönlund, 2009; Eastmond, 2000) and possess the facility to implement advanced educational practices on their own (Sehrt, 2003). The traditional means of learning and teaching that are paper based are still the most commonly used methods, compared to the web-based and online learning methods (Taha, 2007). According to Andersson & Grönlund (2009), developing nations find the traditional means of learning more reliable and maintainable. Nevertheless, Taha (2007) states that the use of ICT for learning purposes is widely accepted in HEIs in Asia. The author of this thesis notes that acquiring the necessary e-learning content and infrastructure is still the main drawback.

2.4 The development of the E-Learning performance

The development of e-learning performance cannot be reviewed without mentioning technological development for the educational tools, due to the fact that both are linked to each other. Generally, technology has rapidly developed in the recent four decades with the invention of Personal Computers (PCs), the invention of the Internet, established Networks and the comprehensive usage of the World Wide Web and ICT. Laurillard said in 2004 regarding the development of technology that there has been a "*historical accident driven by curiosity, the market, luck, and politics"* not by the needs of learners. She added that "*Learning technologies have been developing haphazardly, and a little too rapidly for those of us who wish to turn them to advantage in learning*". (Laurillard, 2004, p.7)

The following table 2.1 shows some of the main developments in ICT and delivery technologies, which concluded after the last four decades (from 1970's to 2010's) including what was used before and what is used now. This is derived from the presentation of Laurillard (2004, p.8).

Table 2.1: the technology development tools conclude the last four decades that is derived from the presentation of Laurillard (2004, p.8)

Date	New technology	Old technology equivalent	Learning support function
1970's	Interactive computers	Writing	New medium for articulating with ideas
	Local hard drives and floppy discs	Paper	Local storage with the user
1980's	WIMP interfaces	Contents, indexes, page numbers	Devices for ease of access to content
	Internet	Printing	Mass production and distribution of content

	Multimedia	Photography, sound, and film	Elaborated forms of content presentation
1990's	Word wide web	Libraries	Wide access to extensive content
	Laptops	Published books	Personal portable access to the medium
	Email	Postal services	Mass delivery of communications messages
	Search engines	Bibliographic services	Easier access to extensive content
	Broadband	Broadcasting, telephones	Choice of elaborated content and immediacy of communication
2000's	3G mobiles	Paperbacks	Low-cost access to elaborate content
	Blogs	Pamphlets	Personal mass publishing

Recently, according to table 2.1 concludes the transition for the changing in learning attitudes. Downes has said in eLearn Magazine: "*The learners absorb information quickly, in images and video as well as text, from multiple sources simultaneously. They operate at (twitch speed), expecting instant responses and feedback. They prefer random (on- demand) access to media, expect to be in constant communication with their friends*." He proposed that these qualities affect the way learning should be presented to learners. Also, he added: "*In learning, these looks are manifest in what is sometimes called learner-centered design"* (Downes, 2006).

2.5 The education theories and the models of E-Learning

2.5.1 Bloom taxonomy

This is the famous theory, Taxonomy of Educational Objectives, which was introduced by Professor Benjamin Bloom at the University of Chicago in 50s. The main objective of this taxonomy was to structure a system for categorising and quantifying learning behaviour to assist in the development and assessment of educational learning (Bloom and Krathwohl, 1956). Firstly, Bloom identified the cognitive domain with six learning levels: recall data, understanding, applying, analysing, synthesising, and evaluating. The original taxonomy was used to classify circular objectives and test learning objectives across the six learning levels. Then, an adjusted version of the cognitive domain was produced: levels five and six from (synthesis and evaluation) were replaced by evaluation and creation. Psychomotor domain addressed the skills related to practical applications (Anderson and Krathwohl, 2001). Figure 2.1 shows the six levels of Bloom's taxonomy.

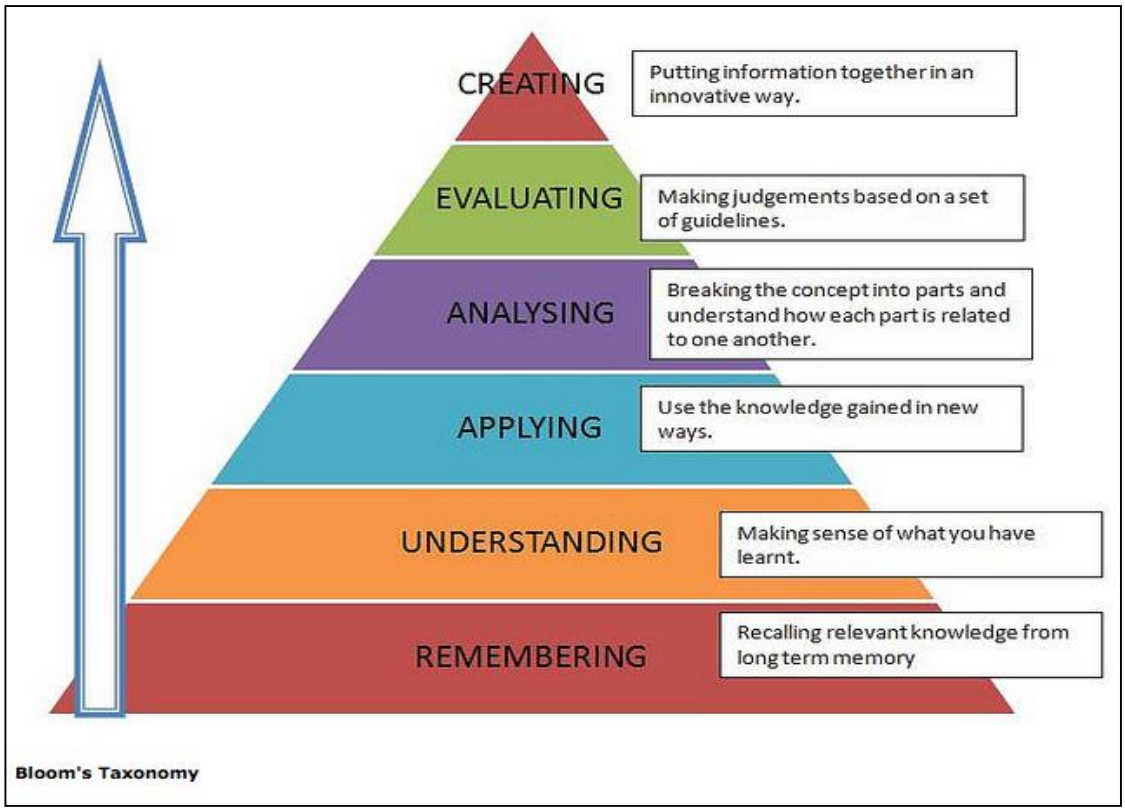


Figure 2.1: Structure of Bloom's Taxonomy (Bloom and Krathwohl, 1956).

From 1956 to 2012, Bloom's taxonomy has developed and changed its verbs many times to give a more specific presentation of learning outcomes that can be classified into three skills. Table 2.2 contains cognitive, affective and psychomotor skills and the learning levels start from the simplest one (for basic competencies) to higher learning levels (for more specific and complex competencies).

The learning levels classifications corresponded to student ability to learn and practice a range of knowledge, attitudes, and skill competencies from lower to higher learning levels. There were other systems or hierarchies devised in the educational and training world, but bloom's taxonomy still is widely applied in the present day.

Table 2.2: The classification for the learning levels of Bloom's Taxonomy

Learning Level		**Cognitive skills**	**Affective skills**	**Psychomotor skills**
Lower Learning Levels	1	Recall	Receive	Observe
	2	Understand	Respond	Perform
	3	Apply	Value	Demonstrate
Higher Learning Levels	4	Analysis	Organise	Construct
	5	Evaluate	Characterise	Design
	6	Create		

It was obvious here that the three versions were re-named and some categories were added to Bloom's original taxonomy. The learning levels were renamed and physical movement skills were expressed by action verbs. The learning levels were listed according to the skills required, from simple to complex. This taxonomy could be applied to design practical learning activities for students in the workplace environment (Alseddiqi, et al., 2012). The three domains (cognitive, affective, and psychomotor) emphasised the importance of including learning activities, which enable the development of employability skills for students. Hence, the Web modules in this research should enable individuals to develop the skills that related modern initial requirements.

2.5.2 Salmon Model

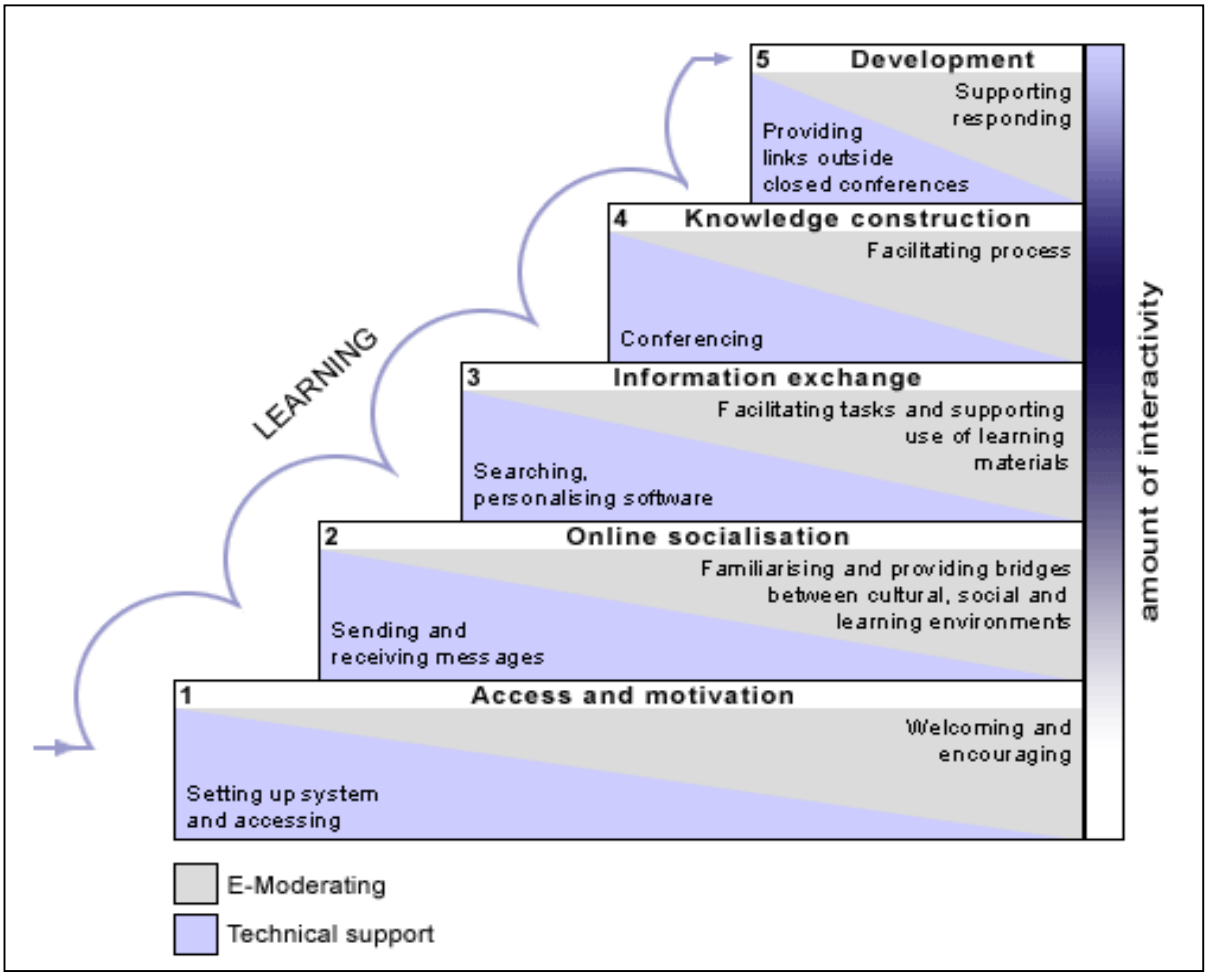


Figure 2.2: Model of Five Stages (Salmon, 2000; 2004; 2011)

Salmon designed a model in 2000 that has proven its success in relation to e-learning theories (see Figure 2.2). This model includes five stages, which are detailed as follows.

Each stage requires participants to master certain technical skills and calls for different e-moderating skills.

The “interactivity bar” running along the right of the flight of steps in the model suggests the intensity of interactivity that can be expected between participants at each stage. At the first stage, they interact only with one or two others. After stage two, the numbers of others with whom they interact gradually increases, although stage five often results in a return to more individual pursuits. This model in brief explains a relationship between the teachers or the lecturers and their students thought table 2.3; whereas, the case of this research depends on the third stage of the information exchange as base to the fourth stage, which the more active for the lecturers’ activities, then comes the fifth stage that more important for the students as following:

Table 2.3: The relationship between the lecturers and their students.

The stages	Student activities	Lecturer activities
First stage: Access and motivation	Putting up the system of any soft tools or software package and accessing it	Welcoming, encouragement and helpful guidance on everyplace to find technical support
Second stage: Online socialization	Sending; receiving and exchanging the messages	Introductions; openings; ground rules and the netiquette given
Third stage: Information exchange	Moving out activities; reporting and discussing the findings or the results	Support use of learning materials; simplify structured activities; giving the roles and the tasks; sum up the findings or the results; and encourage the discussions
Forth stage: Knowledge construction	Building connections between models and work-based learning experiences; discussions and serious thinking applied to topic material	Asking questions and assigning exams; make open activities Facilitate the process of discussion and encourage reflection.
Fifth stage: Development.	Consideration the learning processes; students become critical of the medium; usage the conferencing in a strategic way and combination of CMC into other forms of learning	Encourage reflection; support and respond only when required

The convergence model indicates that three factors need to congregate for e-learning to be a success.
At stage one, an individual’s access and the ability of participants (Lecturers + students) to use CMC (Computer Mediated Communication) are essential prerequisites that depends on the set-up by technicians and encouragement from participating academic staff. Stage two includes individual participants establishing their online identities and then finding others with whom to interact. At stage three, participants give information relevant to the course to each other, so that a form of cooperation occurs by individuals supporting each other’s goals. At stage four, a related group discussion of the course becomes more collaborative. The communication depends on common understandings. In stage five, participants look for more benefits from the system to help them achieve personal goals, explore how to integrate CMC into other forms of learning, and reflect on the learning process (Salmon, 2011).

2.5.3 The Rogers Model of Diffusion of Innovation (RMDI):

Rogers has been designed a model in 1995 for the diffusion of innovation, which suggested that the adoption process might be divided into five series stages as following: awareness, interest, evaluation, trial, and then adoption. To clarify:

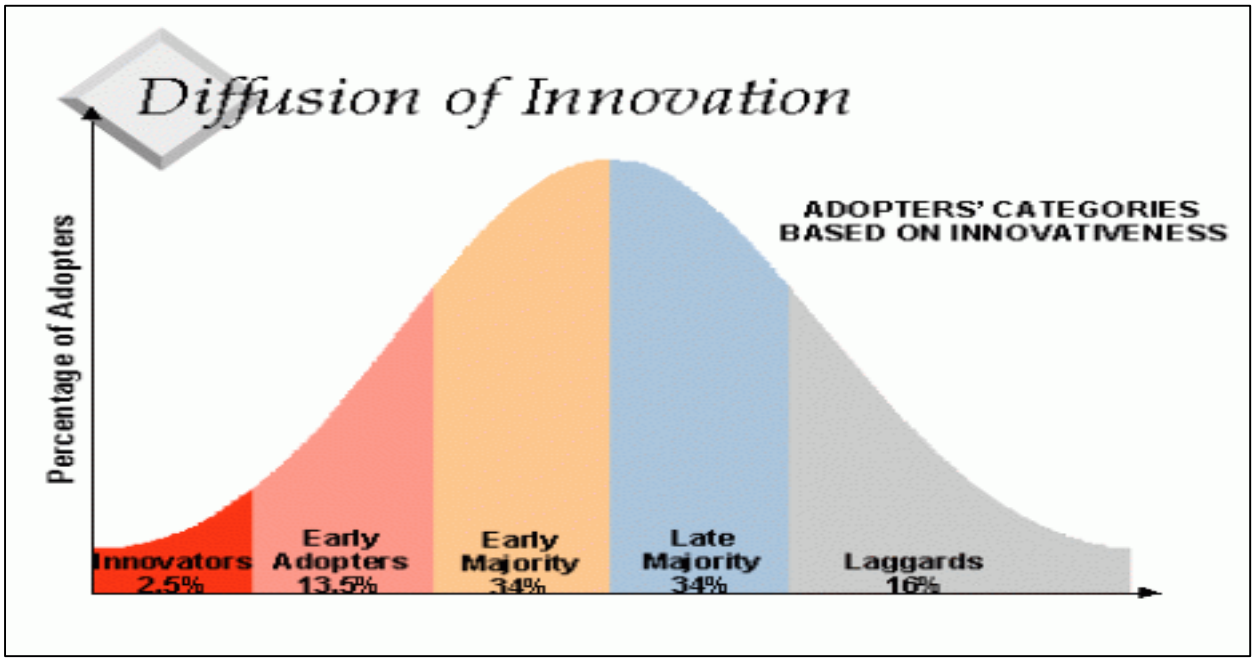


Figure 2.3: The Rogers Model (1995) of Diffusion of Innovation.

Awareness stage. This refers to the level of knowledge, where the individual is first exposed to an innovation although lacks information.

Interest stage. The individual in this stage is interested in innovation and vigorously requests information into the innovation.

Evaluation stage. Here the decision-taken; wherein the individual takes the idea and the conception of the innovation and balances between the advantages and the disadvantages of the innovation usage and then choose whether to adopt or reject this innovation.

Trial stage. The **i**ndividual implements the chosen innovation on a fluctuating degree depending on the situation. In this stage the individual controls and fixes the effectiveness of the innovation.

Adoption stage. This is the touches-making stage; wherein the individual finalises and confirms their decision to regenerate using the innovation and might use the innovation to its maximum potential.
Rogers, in his book "Diffusion of Innovations", has described an adopter classification as a arrangement of individuals within a social organisation by the basis of innovativeness (Roger, 1995); He classified the five

categories of adopters in order to systematise the adopter categories usage. It must be noted that the adoption of an innovation curve strategised a length of time. The classifications of adopters are: innovators, early adopters, early majority, late majority, and laggards (Roger, 1976).
This section presents the classifications of innovation curve stages according to the Roger Model in general (see figure 2.3), and then in table (2.4) it briefly presents the characteristics of the diffusion of innovations that apply to e-learning adoption.

Innovators - these are the first individuals who adopt an innovation. Innovators are ready to gross possibilities. Usually, the youngest in age who have the highest social class and have nearest contact to scientific interaction with the others. In Roger curve they have 2.5%.

Early Adopters – this is second fastest growing category of individuals who have adopted an innovation. They are from the mature people who have the highest degree of leadership with the other adopter categories and have a higher social status, advanced education, and are more socially forward than late adopters (Rogers, 1995).

Early Majority - In this category, the individuals have adopted the innovation after a changing degree of time. This time is lengthier and slower than the innovators and early adopters. They have contacted with early adopters, and gained the opinions of leaderships.

Late Majority - These individuals have contacted into the innovation with a high degree of skepticism after the majority of group have adopted the innovation. They are partially still skeptical about an innovation and in contact with others in late and early majority.

Laggards – these individuals are different in the last category to adopt an innovation. They have little to no opinion leadership and typically have alienated into the changing agents. They normally incline to be focused on “traditions”, oldest of all other adopters, very little to now opinion leadership, they have 16% (Rogers, 1995).

Table 2.4: The classifications of innovation curve stages according to Roger Model

Cate-gory	**I. Innovations**	**II. Early adopters**	**III. Early majority**	**IV. Late majority**	**V. Laggards**
%S	2.5%	13.5%	34%	34%	16%
The characteristics	The persons who have used the new innovation at first time. (The venturesome Who interested by new idea)	The early supporters and users case. (*Transfer and directed the* ideas of innovations to other and the highest degree *to contain* the opinion leadership)	Majority resulted by the increase in early adopters. (Deliberate or adopt new innovation just before the average member of system)	Majority who adopt the innovation but late that early majority (skeptical or adopt new ideas just after the average member of a system)	Percentage of community resisting change (traditional or suspicion of innovation and last to adopt an innovation and not opinion leaders)

2.6 Epistemology of e-learning

Epistemology comprises the specific understanding of the nature of knowledge and the creation of it. Hence, it impacts upon the perception of learning opportunities and professional learning activities. Many educational organisations apply computer technology in order to support staff development through e-learning activities. However, a closer look at the practices of e-learning reveals that only rarely is the potential of educational technology for professional learning fully utilised. Frequently, it is neglected that employees' subjectivity - in particular their epistemic beliefs - determines their ways of using educational technology for self-directed learning activities.

Epistemic belief is the individual conviction regarding knowledge and knowing (Mormann, 1988); their influence on university students' learning strategies and learning outcomes has been intensively investigated. Nevertheless, regarding the role of epistemic beliefs for work related learning activities, for example, how they influence the practices of using e-learning opportunities in the context of daily work-life (Harteis et al., 2010).

It is still unclear how epistemic belief contributes to distribute learning activities, which are emphasised in the contexts of learning organisations and of professional learning. Within these approaches, continuous learning is not necessarily found in formal learning settings, it is considered to be an instrument of adaptation to rapidly changing market conditions (Mormann, 1988). The right of continuous learning not only refers to members of the leading hierarchy and the management team in enterprises, although to employees without leading function. At any rate and according to the programmatic concepts, stakeholders are believed to work on complex, all-inclusive tasks as well as to take decision competence and responsibility.

Epistemic beliefs influence how individuals behave, and hence they also affect working and learning. In the past, much emphasis in empirical research was placed on analysing the impact of epistemic beliefs on school and university study Harteis et al (2010) and Schommer (1998) presented evidence suggesting that the complexity of a person's system of epistemic beliefs has substantial implications for learning; therefore, students who believe that:

- Learning occurs quickly; tend to read texts more superficially.
- Knowledge is certain; tend to learn facts by heart rather than understanding the meaning of what is to be learned.
- Learning capabilities are determined by innate abilities, show less interest in activities designed to master complex challenges.

E-learning requires more than just technology to be successful. There is the need for academic professionals who are well trained in ICT, capable of using e-learning systems and developing learning materials that address the needs of learners. Locally based technicians are also required to maintain

equipment as well as e-learning systems and tools (Kenan et al., 2011). To explain this significance further, this chapter will review the national culture and its effect on e-learning processes, and then compare it with international culture by exploring the latest studies, and the results of pedagogical and technological analysis in 'Contexts for E-Learning Implementation at Tripoli University', as presented at the Oxford Conference, 2012 (Kenan et al., 2012C).

VLE could be defined as – 'A Virtual Learning Environment is a collection of integrated tools enabling the management of online learning, providing a delivery mechanism, student tracking, assessment and access to resources'. These integrated tools may be one product (e.g. Blackboard, Moodle) or an integrated set of individual, perhaps open-source, tools (Khan, 2001)

This definition still holds true with most education providers using a 'product' for example Blackboard or Moodle with Web2.0 tools being used to supplement the functionality offered by these systems, but these are often not truly integrated (Othman, et al., 2013A).

There are many excellent current examples of e-learning and e-tutoring, and it is anticipated that these will be used to update this resource in the near future (Salmon, 2011).

- Demonstrate a working understanding of strategies of use for e-learning for meeting a range of pedagogical, practical and social needs within courses of study. (Evans & Rainbird, 2002).
- Work comfortably with the e-learning resources available within their own institutions including an institutional VLE (Greene et al., 2008).
- Identify opportunities and recognise limitations for the use of VLEs for teaching and the support of learning (Elliott & Clayton, 2007).
- Feel sufficiently confident to provide and support virtual learning activities within their course programmes (Hofer & Pintrich, 2002).
- Reflect upon and develop their professional practice through the use of e-learning resources. European Commission (2006).

The main aim from this is to enable tutors to make informed decisions based on sound educational principles regarding the use of technology in their teaching and their students' learning when using a VLE. The HEIs emphasised the underpinning pedagogy in the use of e-learning (Garrison & Anderson, 2003). They make reference to different VLEs, which were available at the time of writing through the tertiary sectors in the UK (Alexander, 2006). However, the aim was to go beyond a simple demonstration of hardware and software, and the basics of how to operate these, and focus on why HEIs use VLEs and in what circumstances they are used (Consultation Unit, 2007). Therefore, links should be provided to a range of case studies and examples of good practice to help tutors engage in the whole process of using a VLE to provide a more effective learning environment (Jacky, 2006).

2.7 Internationalizing Framework in HEIs

This framework purposes to encourage and assist in the process of internationalising HE: formulating 21st century graduates to live in and contribute responsibly to a globally interconnected society (HEA, 2014). It is driven by a vision to promote a high quality, equitable and global learning experience for all students studying HE programs, regardless of their geographical location or background. It is designed as an enhancement tool for HE; to complete the following objectives:

1. To recognise and enhance the quality and variety of internationalisation policy and practice in HE;
2. To foster collegial educational methods those transcend national and international boundaries;
3. To acknowledge the current institutional and individual roles and responsibilities essential to understand the internationalising of HE.

However, there are many ambitions that recognising learning as socially situated, the framework aspires to having regard for:

1. HEIs become an international community.
2. The impact of cultural, individual and linguistic multiplicities in any given context;
3. The continual improvement of the activity, knowledge and values necessitated for internationalising HEIs;
4. The sharing responsibility for internationalising HEIs between organisations, people and curriculums;
5. The sharing and collaborative ways of working; and whole academic lifecycle;
6. Differences in interpretation and application that are relevant to diverse contexts.

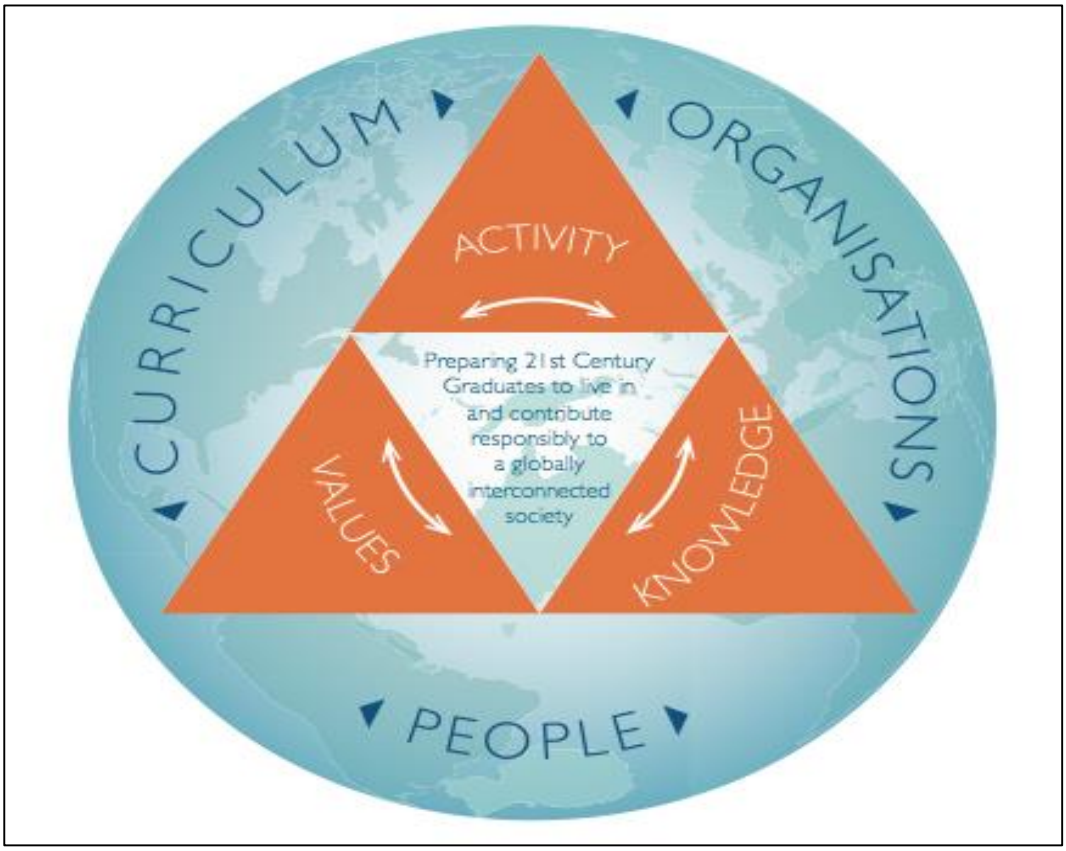


Figure 2.4: Internationalisation framework of the HEIs within the UK. (HEA, 2014)

The internationalisation framework shows the growing importance to HEIs in the UK and across the world, throughout the political, economic, educational, social and technological advances. This is evident in the change of academic communities and the provision on offer, as well as the content, mode, pace and place of learning. Through this change, the Higher Education Academy (HEA), the leading national body for learning and teaching in the UK, has developed this strategic framework with the purpose of inspiring and assisting the sector in a key aspect of internationalising HE: Preparing 21st century graduates to live in and contribute responsibly to a globally interconnected society. The framework has been developed for the UK sector, but may also have relevance for HEIs systems throughout the world (HEA, 2014). This framework has been driven by the vision of promoting a high quality, equitable and global learning experience for all students studying UK programs, regardless of their geographical location or background, on which the readiness of graduates will be dependent; whereas with a focus on the impacts; contribution of learning and teaching; a collaborative project intends to maximise relevance and future impact.

Figure 2.4 presents the framework and how it has been applied. The framework was intended for several spectators related to the HEIs, who can benefit from the process of internationalising HE in relation to learning, teaching and research. Individuals or teams can use it. It is designed to be used flexibly and openly, with different applications considered relevant for any given context. The framework offers critical engagement with a range of concepts, actions and connections, which are included in the process of internationalisation. It provides a shared point of reference and common language to discuss and shape policy. The fundamental elements of the framework are demonstrated as following: strands of activity, as well as the supporting and connected sets of knowledge and values required to implement them effectively. It may be that putting this into practice is complex task. To identify different entry points and the necessary engagement of different levels of input and perspectives, the information is grouped into three principal audiences:

1. Organisations or the HEIs

The collective level includes sector agencies, professional, decision makers, statutory and regulatory bodies, unions, and employers and others that influence in HEI. The framework can quick joint enquiry and development of the communal aspects of design and delivery including policies, systems and procedures to improve and enhance the contribution and impact of organisations in internationalising HE (HEA, 2014).

2. People

The individual level includes all staff, students, employees, and associates. The framework can be used to reflect upon, and modify as necessary, attitudes, knowledge, values and practice to enhance the contribution and the impact of individuals in internationalising HE.

3. Curriculum

This includes the contents, design and delivery of learning and teaching material; it also includes the formal and informal curriculum. The framework can be used to review and enhance the contribution and impact of the curriculum in internationalising HE.

For every one of these key categories, there is a proposed set of related responsibilities and potential benefits of engaging with internationalising HE; the latter being related to each of the activity strands; it is

an operational implications section, posing a set of key questions that need to be considered. The statements and questions contained within the framework are interconnected, prompting a rounded consideration of the interrelated role of organisations, its people, and the HE curriculum; as well as between and across activity, knowledge and values.

2.8 Chapter summary

This chapter presented the literature that is related to this study. The definitions, adoption and evolutions' performance of e-learning in HE, Also, presented the development it within the theories and the models which affect learning and e-learning as Bloom taxonomy and Salmon model. However, it is given overview on the epistemology of e-learning and the internationalising framework. The next chapter will be offering the effectiveness of development on the e-learning performance within different case studies from different places.

Bloom taxonomy and epistemology – used to prepare the case studies which have been included in the e-learning package (see appendix F).

Salmon model for e-learning and user center design approach – used to design, develop and implement the e-learning package (see Appendix F).

Internationalisation framework and Rogers Model of Diffusion of Innovation –considered when building the proposed I-Cube model (see Chapter 7).

Action research approach – the e-learning package was designed and then used by teachers and students during one academic year. The analysis of results for evaluation questionnaires completed by teachers and students has contributed to the formulation of recommendations for the development of e-learning strategy in the School of Engineering at Tripoli University, Libya (see Chapter 8).

Chapter 3: The effectiveness of development on the E-Learning performance

E-learning moves and enters into teaching activities from a wide range. Therefore, to generate an effective, distributed and flexible learning environment for diverse learners, it is a necessity to explore the key of factors, which includes numerous dimensions of the e-learning environment.
In accordance with this, some of the literature on the effectiveness of e-learning programs uses the term (CSFs), which means “Critical Success Factors”. This term is initiated in the area of the implementation, management and the evaluation. It states to the individual and personal factors that are fundamentally; if an institute or any organisation is to be successful in getting its goals (Jan, et al., 2009). The CSFs are described as those areas that an organization must get right or it will not succeed. The CSF attitudes seek to classify into some factors that are in the “must get right" category. (Khan, 2005).

Otherwise, the adoption of ICTs and e-learning in education in developing countries faces many difficulties and obstacles, such as, the infrastructural context, the cultural context, and the transferred knowledge (Kohn et al., 2010). Many studies have been directed to investigate ICT and e-learning usage in HEIs, and to determine the challenges and enablers of e-learning in different African countries, such as Egypt (Abdel-wahab, 2008; El-Gamal & El-masry 2005); Libya (El-Hawat, 2004 & 2005); Nigeria (Ajadi et al., 2008); and Tanzania (Bhalalusesa et al., 2013).

Numerous developing countries lack basic components, which are vital to the implementation of e-learning, such as computers and internet access (Rhema& Miliszewska, 2011) & (Hussain, 2007). This is coupled with a lack of technically qualified staff to pass out necessary installations, lack of funds to acquire all the essential infrastructure, and poor planning (Oliver, 2001). Those factors increase the possibility of failure of e-learning projects and student access limitation to e-learning infrastructure (Bhalalusesa et al., 2013).

The strength of the CSF approach lies in its focus of attention upon responsibilities and activities (El-Gamal, et al., 2014), which should be right if purposes and objectives are to be accomplished (Conole, et al., 2004). Linking in with this, numerous researchers and studies have extended the issue of what affects the success and e-learning quality systems; and moreover, they have suggested and recommended different sets of factors to be powerful into successful e-learning and have high quality systems.

This chapter includes a review of seven literature resources from different countries, which discuss the factors affecting e-learning development. The review presents an overview of each study and what factors were suggested through them. Also, an analytical review is conducted to check the existences of different factors between the seven studies reviewed. This method was respected so as to benefit from the experiences of countries that have had a head start in e-learning adoption and development. These studies have been overviewed by the modern order latest to oldest, from 2013 to 2000; and in what way they approach e-learning development.

3.1 Challenges of using e-learning management systems

Bhalalusesa et al., in (2013) conducted from their study in University of Tanzania; a serious evaluation of research relevant to the challenges of e-learning; particularly in developing countries. Their evaluation can be classified into factors divided into four challenges type relating to:

(1) Individual factors or characteristics (both teachers and students);

(2) Technological factors;

(3) Course factors (pedagogy, activities and different supports) and

(4) Contextual factors (the institutional management and organisation, regulations).

A summary of these challenges is presented in next table.

Table 3.1: Framework for e-learning challenges (Bhalalusesa et al., in 2013)

Individual factors	Students	Motivation; Conflicting priorities; Economy; Academic confidence; Technological confidence; Social support; the gender and Age
	Lecturers	Technological confidence; Motivation and commitment Qualification and competence also, the Time
Pedagogical factors	Course design	Curriculum & Pedagogical model & Subject content & Teaching and Learning Activities & Localization and Flexibility
	Support provided	The support for students from faculty & Support for faculty
Contextual factors	Organisational	Knowledge management; Economy and funding and Training of teachers and all staff
	Societal/ Cultural	Role of teacher and student, and attitudes towards e-learning; and the rules and regulations
Technological factors	The access & cost & Software and interface design, also, Localisation	

Bhalalusesa et al., in (2013) show that through the reviewed research they have managed to focus on technological and contextual challenges facing e-learning in developing countries, and suggest that phases relevant to individuals' characteristics are yet to be adopted; whereas the hierarchical teaching methods in many developing countries may have to develop into a pedagogy that is more attuned to students' activities, self-learning and motivation. This is considered as a step by step change, since it will change traditional roles on the part of students as well as teachers. This change will require a focus on individuals' activities and perceptions, and how the changes to education caused about by e-learning affecting.

3.2 Contingency model of factors that could influence HEIs strategies of e-learning's adoption.

Boezerooij (2006), in her a book, presents a contingency model of factors that could influence HEIs strategies of e-learning's adoption. She has developed her model, which is established on literature and studies that explore key characteristics and influential variables of e-learning.

Boezerooij divides those variables in two classifications: independents and dependents. The dependent variables are the strategic choice of the institution, whereas independent variables include external and internal contingencies. The internal contingencies are linked to the institutions' characteristics and summary in terms of flexibility, stakeholders' management, lifelong learning support, research faced policy and

adequate assessment and evaluation approaches. Additionally, to the usage of technology within the institution and pedagogical flexibility of content.

However, the external contingencies include technological factors, for example, communication tools and access to internet; demographical factors (the general mixture among students population); economic factors (public spending); governmental factors (policies, incentives) and national factors.

This division of factors, which was introduced by Boezerooij (2006) could be due to the nature of her study, since she is observing the causes behind why institutions differ in their strategic choices in considering e-learning implementation.

3.3 E-Learning Quality Assurance Factors

Fresen in (2005) instigated a study that explores quality assurance of online learning programs through evaluating e-learning programs at the University of Pretoria in South Africa. The evaluation was built on a framework that gathers CSFs of online learning, which was demonstrated using an acceptable questionnaire on a sample of 4651 respondents at end of three semesters.

The framework which is showing in figure 3.1, was used was prepared and grounded on a review of literature that approached e-learning quality assurance from several different approaches. It consists of six main categories of factors, including, institutional factors, technology factors, lecturer factors, student factors, instructional design factors and pedagogical factors. (Fresen, 2005)

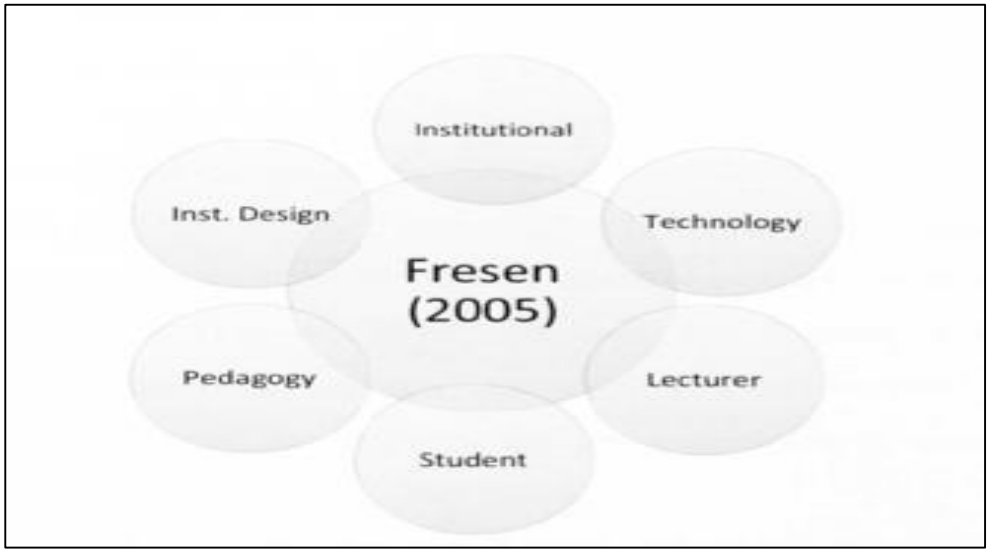


Figure 3.1: E-Learning Quality Assurance Factors (Fresen, 2005)

Every group contains numerous sub-elements. The framework of Fresen can be summarised as follows:

1. **Institutional Factors -** Generally its focus is placed on the institution's policy role considering diverse components of online learning systems. It includes the planning of whole institutional technology strategy, which should perform as a guide to whatever technical requirements or improvements are required, and how to meet those requirements in order to confirm a quality technological infrastructure that effectively provisions online learning courses.

However, the institutions' role lies in providing support for students in terms of resources and the availability of suitable learning articles or objects. This framework has emphasised the importance of different types of support that institutions must provide for the learner advice, counseling, library services, financial aids, etc. Additionally, Fresen indicated that the role of the institution also lies in evaluating the packages accessible online; to maintain an up-to-date image of currently situation, and also attends to required improvements.

2. **Technological factors -** The technological factors involve the availability of a reliable and steadfast technological infrastructure that provides 24/7 access for all stakeholders in different learning objects. It also demonstrates the importance of technical training and support for both of them in general.

3. **Lecturer Factors -** Fresen's (2005) framework also includes a focus on the role of the lecturer in the online courses context as characteristics and performance. The lecturer role level, it contains on facilitation of web-supported learning, delivering students with productive feedback and maintaining a constant situation of interaction with students, in order to answer their investigations and assist them to keep going in the correct direction. On the lecturers' performance level and characteristics, Fresen (2005) added that the lecturers should have adequate qualifications and academic background, as this will reflect and replicate on their performance in dealing with their online students. She also referred to the lecturer's professional training and development, as well as conducting regular evaluation of the lecturer's competence.

4. **Student Factors -** The student factors category was important in Fresen's (2005) framework, where she focused on student's characteristics and commitment regarding studying online. This includes the ability to be acceptable within the online learning community and communication with colleagues and lecturers, in addition to time management and task completion inferences. Also, it contains the student's expectations and positive attitudes toward online learning. She emphasised that online learners must employ critical thinking strategies and improve problem-solving skills that will reflect on their performance and achievements.

5. **Instructional Design Factors -** Fresen (2005) has given a great deal of consideration to instructional Design Factors. She states that the service of activities that encourage co-operative and group work together with engaging students in higher cognitive level help in creating knowledge. Instructional design factors also consider the application of design standards and guidelines, for example, purposeful use of multimedia, appropriate use of pictures and graphics, suitable layout and presentation, consideration of bandwidth and download limitations. Fresen emphasised the criticality of inclusivity in online learning courses design, in terms of social, cultural, disability and gender diversity.

6. **Pedagogical Factors -** This factor includes a clear statement of course results and objectives; best assessment strategies; clearly stated expectations in terms of minimum levels of participation and assignment completion; instructions to be made in correct research methodology; relevance, accuracy and currency of content and resources offered; and a comfortable and non-threatening learning environment. This outlines several pedagogical factors that must be carefully considered in the design of online learning courses (Fresen & Boyd, 2005)

3.4 Critical success factors of e-learning at the University of the Arab Emirates

Selim in (2005) performed a study at the University of the Arab Emirates on 538 respondents from different courses in a confirmatory factor models study, tests four categories of critical success factors from the students' perception or point of view. The factors tested were: student characteristics (technology competency and interactive collaboration); lecturer characteristics (approaches towards and control of technology, and teaching style); technology (design and infrastructure, ease of access); and university support through policies formulated by the institution to ease and facilitate e-learning courses.

Selim (2005) examined these factors by dividing them into 53 measurable items that might be responded to by students. The lecturer factors included 13 items, student factors included 22 items, and technology factors included 13 items, plus university support 5 items.

Figure 3.2 shows the factors which have considered as critical success factors front of the e-learning according to Selim case studies.

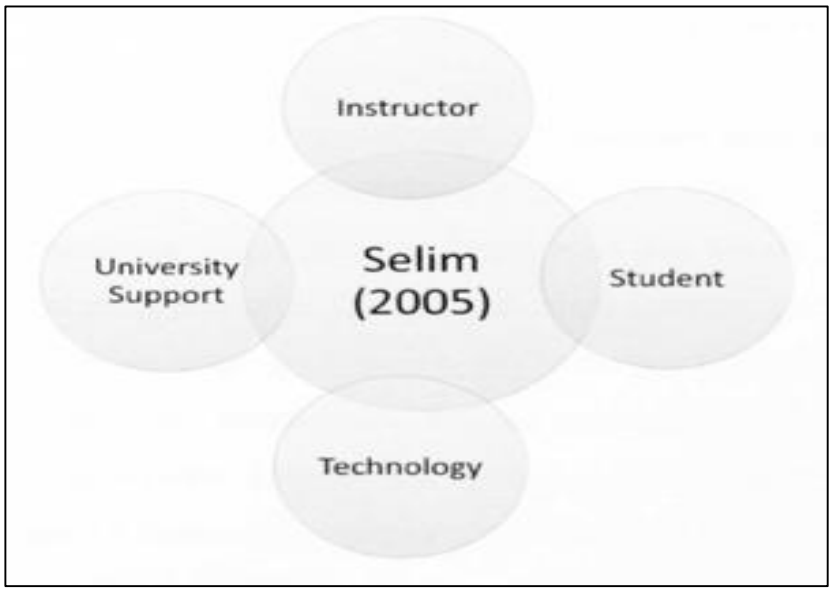


Figure 3.2: Critical success factors of e-learning (Selim, 2005)

According to the study's results, Selim (2005) said, "*all indicators of lecturers' attitude towards and control of technology indicated high level of critically*" (Selim, 2005, p.490). He further elaborated on this, saying that the most critical indicator in the instructors' characteristics category was their attitude toward interactive learning and teaching style.

Through the study results of the students' characteristics category, Selim recommended that technical experience of the student is a critical factor, in addition to self-motivation, he said, "*student's motivation and technical competency measures indicated high level of validity*" (Selim, 2005, p.490). He also stated that the previous technological experience of students ranked as the most critical factor in this category.

In the technology category, "the ease of use of content was the most critical factor followed by browser efficiency and screen design" (Selim, 2005, p.490). He added that most of the technology measure items

indicate a high level of criticality, including infrastructure reliability, availability of computer labs and networks.

In the university support level, Selim's study indicates that there was an agreement that university support should not be limited to technical assistance; it should include library services, resources and information facilities. It is also worth mentioning that the range of the study's sample may inform a reasonable degree of validity of the conclusions, whilst it included 538 students from 37 different courses. Meanwhile, a limitation might be recognized that the measures used in both the survey and the analysis process blend technology and course design into one factor. This might influence the results of the data analysis and cause a degree of inaccuracy in the analysis and interpretation.

3.5 Critical success factors of e-learning for Australian HE

Oliver, who devised a strategy for assuring the quality of online learning in Australian higher Education in 2001, has put forth a number of factors to be studied in online learning or e-learning in order to increase opportunities and reduce risks related with adopting e-learning. He has equipped a discussion of issues to be considered, with a view to create a successful method of e-learning acceptance. Oliver classified those issues into five parts: teacher expertise, student readiness, technology infrastructure, reusable learning objects and reusable learning design; as shown in next figure.

Figure3.3: Critical success factors of e-learning (Oliver, 2001)

The experience of lecturers - Oliver (2001) also, classified the teacher or lecturer expertise section into four issues, all-focusing on technology expertise related issues. The first issue considers the exclusive settings of online learning processes, where he said, *"Teaching Online is a vastly different process to conventional teaching"* (Oliver, 2001, p-33), he stressed that some e-learning programs were developed to replicate the traditional classroom but were unsuccessful and failed to provide a quality learning mode for the student. (Oliver, 2001)

Oliver (2001) supported his argument by referring to literature that put forth similarconclusions such as

(Mioduser et al, 1999); (Dehoney and Reeves, 1999), and added that "*Literature frequently describes online learning settings that replicate conventional teaching practices and which fail to capitalize on the new learning opportunities"* (Oliver, 2001, p-33).

He emphasises watchful consideration of the nature, characteristics, opportunities, controls and limitations to assure the quality and effectiveness of e-leaming packages and programs. Another issue regarding lecture expertise raised were the use of technology in teaching. He emphasizes the importance of frequent usage of technology in teaching by lectures, and that this should improve the adoption of e-learning in several ways, such through improving the technology skills of lectures with students simulateously becoming more familiar with technologies used in learning, which may ease the progression of e-learning adoption. He also, argued that the continuous changes and development in technology signifies a challenge for the lectures.

The institutions will be dealing with two options: firstly, to, continue to use of technology currently used to avoid confusion, time and costs for training; or the second option, update their systems, which will require staff development.

Oliver expanded upon the issue, which is the importance of continuous lectures' training, as teacher's expertise development would be succoring into overcoming problems related with updating. Furthermore, more professionally developed resources influence available for providing successful e-learning packages. Oliver (2001) concluded these issues by an affecting factor for e-learning development could be appointed through staff and institutional strategies' development; when he said: "*teacher readiness is in most instances a matter of staff development"* (Oliver, 2001, p-34)

The student readiness - These issues and factors are critical for successful and quality e-learning adoption and implementation of these factors is associated with student readiness. Oliver (2001) has underlined the critical aspects of learner or students' readiness that need to be addressed.

Primarily, he indicates that technology skills of students is an essential factor that is related to the level of knowledge and acquaintance with technology that students possess, because this specific factor significantly affects the flexibility of the learning process.

Similarly the same source mentions a survey conducted by the department of Education & Australian Training and Youth Affairs (Oliver & Towers, 2000) that discovered that just 60% of university students have the required level of skills needed for self-sufficiency in e-learning.

Secondly, Oliver (2001) stated the accessibility of technology and availability of it, as the ease of access to technology, on campus, at cyber-cafes and at home, may be a barrier for several students who cannot access technology easily, simply because they cannot afford it. He declared that, "many students still do not have access to the forms of technology required for online learning" (Oliver, 2001, p-34).

Technology - The third issue is with regards to technology literacy. He explains by showing that in the e-learning world different formulae of literacy have emerged. Rossiter & Watters (2000) have performed a study among Australian university students, of the developing forms of technology literacy. They discuss that there is a need for universities to involve a technology skills development program course in their

existing programs in order to support students and improve their technology skills, which would reflect positively on their learning progression.

Additionally, the student capacities for self-regulated learning and the settings of online learning follows the concepts of a student centered learning approach, which is a more difficult approach of learning for numerous students. Through being sympathetic of learning progression, the students need support to develop and improve their capacities for self-regulated learning. Oliver (2001) exemplifies this, writing that, "the student centered learning mode aims to promote understanding and deep learning when compared to the alternative shallow or surface learning" (Oliver, 2001, p-34).

The third section put forth by Oliver (2001) of factors affecting e-learning development relates to technology infrastructure, which has been categorized into three groups: course delivery, technology infrastructure and service provision.

- The delivery system should offer a stable learning management system by which learning support activities can be implemented.
- Regarding infrastructure, Oliver focused on the link between online learning and the demand on technology. The provision of online learning through universities creates significant demands on the technological infrastructure. Oliver writes that, "*technology is no longer provided for purely technology related subject students but for all students in all fields of study*" and furthered this point, saying that "*Solutions which universities have sought to meet this need have included large scale open access computer laboratories, optional computer leasing schemes and mandatory computer ownership schemes*" (Oliver, 2001, p-35).

Regarding service provision, Oliver points out that universities who adopted e-learning systems managed to provide students with free access to the resources needed for their learning process.

Since 1996, Jonassen and Reeves have written perfect signal that the need for infrastructure can be tied to the professional development of staff, and consequently the decisions regarding technology development should be based on pedagogical and educational consideration, regardless of the technology itself. The development must be an institutional led activity rather than an upgrade that is required because new advanced systems are developed. (Rosenberg, 2001)

This proposal might be acceptable when the availability of technology and the resources needed to construct the infrastructure is not a problem for the institution that is demanding to adopt e-learning systems. In some cases, the availability of technology and resources needed for infrastructure represents the leading element in making decisions.

Reusable Learning Objects - This section focuses on factors affecting e-learning, which are connected with issues related to learning materials. Critical to the success of online delivery strategies within HEIs is the prevalence of materials and resources to support the learning settings, whereas the costs involved in designing, updating and developing e-learning materials represents a challenge for institutions and consequently affects the adoption of online learning. (Oliver, 2001)

Oliver also reported that institutions are developing a new style of e-learning course materials, which includes developing reusable learning objects. These objects are defined as "*any entity, be it digital or non-*

digital, that may be used for education and training" (Oliver, 2001, p-36). He recommends that these reusable e-learning objects could exploit the use of materials. Oliver stresses the importance of materials development, concluding, "*Learning objects serve many functions associated with providing quality measures for online learning. In addition to providing cost-effective measures for development, they support quality instructional design*" (Oliver, 2001, p-36).

Reusable Learning Design - Oliver, in 2001, has finalized and completed his group of factors and issues connected with e-learning development, by the e-learning platform. He noted that existing designs of e-learning delivery modes are moving from fixed formats to more dynamic and deliberate designs, by considering the contemporaneous online learning development in HEIs is moving left from the idea of learning settings being included of electronic text, to more purposefully planned learning designs; although the focus of initial designs of delivery e-learning systems was on providing passageways for the students within the content.

"*Most Australian universities tend to provide courseware delivery systems as the basis for the delivery of online programs; these systems provide supports for the teachers but do not actually provide any firm learning designs as the basis of their delivery. As a consequence there is a high degree of sameness that emanates from online courses delivered by such systems*" (Oliver, 2001, p-37). Oliver believes that the critical point is to develop a range of high quality learning designs that preserve be made-to-order by lecturers and allow them to engage the learner or students with the content more effectively. The point may be raised that this might have been addressed at several levels, as different e-learning platforms (Web CT, Blackboard, Moodle) that are finely designed and flexibly editable, allowing lecturer to customize the design to happen the course goals, outcomes and achieving the concept of re-usability, as institutions can use these platforms when they need.

It may be proposed that Oliver (2001) missed the institutions' role regarding supporting e-learning programs, which could signify a gap in terms of the strategies, management, policies, assessment and evaluation requisite to maintain a successful implementation of online learning programs.

3.6 E-learning framework

Badrul Khan in 2001 presented an e-Learning framework that was established upon consideration of diverse factors and issues that have an effect on the progress and achievement of e-learning systems. Khan (2001) indicated that e-learning development is affected by a set of factors that could be classified in eight dimensions: Pedagogical; Technological; Interface Design; Evaluation; Management; Resource Support; Ethical; Institutional. See figure (3.4).

The first dimension suggested in Khan's framework is the Pedagogical dimension which refers to "teaching and learning. It addresses issues concerning goals/objectives, design approach, organization, methods/strategies and instructional media of web-based learning environments". (Khan, 2001, p-79)

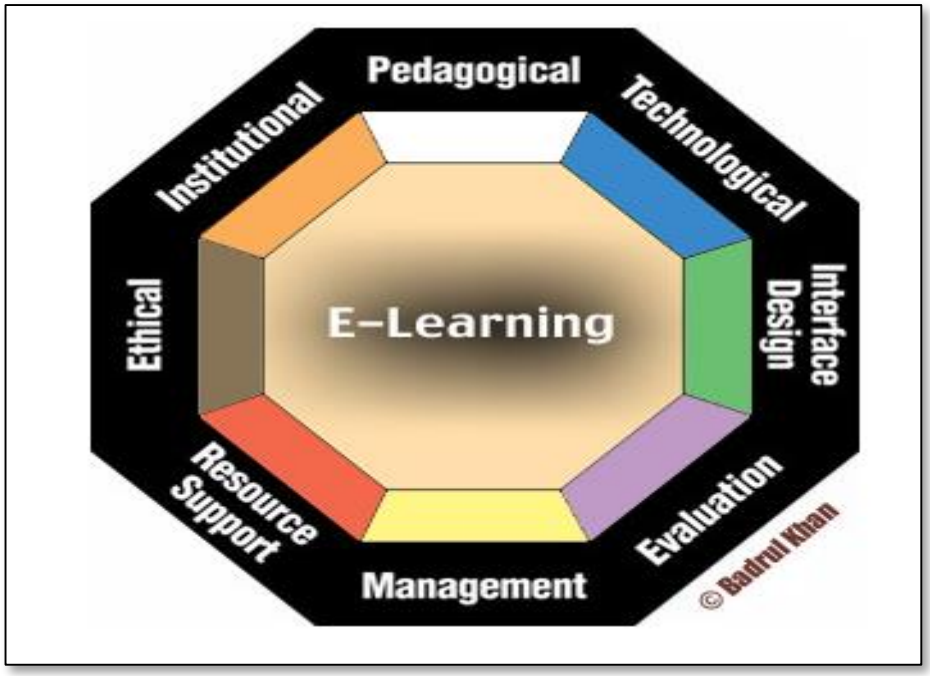


Figure 3.4: Critical success factors of e-learning (Khan, 2001)

The pedagogical dimension of Khan's framework includes five factors that focus on the pedagogy of content presented. These factors include:

1. *Goals/Objectives*: providing the student with a clear statement of course goals and objectives.

2. *Design Approach*: Khan (2001) has suggested that "*design approach for web based learning activities is dependent on the type of domain of knowledge of course content*" (Khan, 2001, p-79). He indicated towards different learning approaches (Instructivist-Constructivist) and how this affects the overall pedagogical-philosophy of the course design. Furthermore, the chosen content design would reflect on the lecturer role. In other words, the lecturer's role should be more facilitative than educational or more educational than facilitative or a combination of both. Khan (2001).

3. *Methods and Strategies*: This involves different activities used to facilitate the process of learning, and help learners achieve their learning goals. Khan wrote that "the methods used in web-based course will be based in part on the philosophical approach of the course. A variety of instructional activities can be incorporated into web-based instruction to facilitate learning, and the technical and structural attributes of the web can be used to support these activities" (Khan, 2001, p80-81). He referred to numerous instructional activities that could be used in web-based learning such as: tutorials, games, presentations, discussions, case studies, simulations, etc.

4. *Organisation:* Khan (2001) writes that "*web based learning content should be organised with proper sequencing strategies (ordering of content)".* (Khan, 2001, p-80) so as to help students to shape a stream of information derived from the content. He reviewed to the importance content organization in terms of clarity, style, readability and effective use of multimedia.

5. *Medium*: Determining what medium is to be used in distribution, delivery and examining its attributes and determining which resources that would be best used in learning.

The technological factors were the second dimension of Khan's framework. These are related to "issues of technology infrastructure in e-learning environment including infrastructure planning, hardware and software (Khan, 2001, p-83).

1. Infrastructure Plan: This includes the planning process of IT requirements and the maintenance, evaluation and availability of human resources to maintain and support ICT.
2. Hardware: The availability of hardware required for the course implementation and development at both institution and students levels, to confirm that the student should be clearly informed of the ICT requirements necessary for the completing course.
3. Software: The available of software needs for the course implementation and development inside the institution, as well as software as a course requirement for students.

The interface design, is the third group of factors addressed in Khan's framework that refers to what he said regarding "the overall look and feel of e-learning programs; it covers the page and site design, content design, navigation, and usability testing" (Khan, 2001, p-84). These four elements can be measured in content development as following:

1. The page and site design: The compatibility of the content design with different browsers software and versions. It also refers to the compliance of the course with the accessibility standards and whether or not it allows access to all people, including disabled; and "the physical appearance and functionality of the screen" (Khan, 2001, p-84).
2. Content design: How the content is visually introduced, the presentation of ideas included in the content; i.e. does it present one idea each paragraph; are there enough areas and marks that allow distinction among different paragraphs and ideas; where, how and when pictures or videos are presented (Khan, 2001).
3. Navigation: This involves how easy, clear and efficient the content navigation system and the available site or course map is, which allows the student to jump to what who wants when he wants.
4. Usability: This is a consideration of the ease of useability and reliability of course contents, i.e. could students reach their chosen destinations; find support services and the related links.

Evaluation factors: This includes "both assessment of learners; evaluation of the teaching and learning environment" (Khan, 2001, p-85). Khan in 2001 has addressed evaluation issues from two perspectives:

1. Assessment of students: This involves the assessment of a student's performance and progression.
2. Evaluation of teaching and learning environment, i.e. how the course structure takes feedback from the student regarding content, lecturer, learning environment, resources, course design and technical support.

Management issues: This is the fifth dimension in Khan framework, which has been recommended to include two main fundamentals:

1. Maintenance of learning environment, i.e. staffing, evaluation mechanisms, budgeting, management of course content and learning resources, and security measures. Khan (2001).

2. Distribution of information, i.e. the way information and feedback is exchanged between students and lecturers or management staff. This information might be schedules, curriculums, announcements, contact information, courses, grades or results, feedback, assignments etc. It could be delivered and exchanged by different means or be contingent on the mode of delivery such as: e-mail, announcement page, phone or mail.

The support resources: This is the sixth dimension designated by Khan's (2001) framework, in which he focused on involving "online support and resources required to promote significant learning environments" (Khan, 2001, p-86). Also, he focused on e-learning support through two points:
1. Online support: the accessibility of technical support guidelines, papers and documents.
2. Resources: the accessibility to e-library catalogues and services, access to research databases, online help desk, involving who is who in different sections of the institution, access to online services like student profiles, accommodation information, e-mail service etc.

The ethical factors: These are the seventh dimension of Khan's (2001) framework and involve "the considerations related to social and cultural diversity, geographical diversity, learner diversity, information accessibility, etiquette, and legal issues" (Khan, 2001, p-88). This dimension promotes the importance of considering the diversity of online students.

The institutional factors: This is the last dimension suggested in Khan's (2001) e-learning framework, which focuses on academic relationships and student services, where Khan added: "issues of administrative affairs, academic affairs and student services related to e-learning" (Khan, 2001, p-90).
1. Academic relationships: in terms of institutional support to faculty members to ease the implementation of online courses, it could take the formula of technical, methodological or instructional strategies and support.
2. Services for student: in terms of capability to support off-campus students. This could be library income in different forms like direction programs, bookstore services, counselling, financial aids and other services.

Through Khan's framework of e-learning factors in 2001, it might be observed that he has measured the factors at three levels: student, lecturer and institution. In terms of covering, the e-learning development related issues. Some of the fundamentals discussed seem to be slightly familiar, since he has studied about 20 aspects of content development facts involving interface design, content design, navigation, usability, organisation, support and more. Furthermore, he has recognized different dimensions in the implementation process. Aspects of low significance influence are merged together into one group of factors that concerns both content development and design.
It could be suggested that the evaluation, support, management and ethical factors observed through Khan's framework have all been influenced by the policies of institution. As an example, the evaluation policies and strategies are prepared and implemented according to the standards and rules of the institution. The same situation could be applied on management, support and ethical factors. Hence, it could be

submitted that all of those four groups of factors might be combined in one group that focuses on institutional policies regarding evaluation, management, support and ethical issues of e-learning programs. The general conclusion that might be gathered from this is that Khan (2001) struggled to cover each single detail relating to e-learning development, which may have resulted in a large number of overlapping, and in some cases, similar factors which could at some point produce confusion, particularly in the implementation process context.

3.7 E-learning quality benchmarks

The Institute of Higher Education Policy (IHEP) of Washington in 2000, organised a report centering on the quality of online learning programs through signifying essential benchmarks critical to offering quality e-learning (Washington, DC). This report was established through a research study, which involved three consecutive stages, which are as follows:

The first stage involved a comprehensive literature review linked to quality benchmarks and development factors of e-learning that followed in a total of 45 benchmarks suggested by different researchers and studies.

The second stage involved classifying the institutions that have considerable experience in e-learning and formally testing the presence and importance of the 45 benchmarks against the experience of those institutions. The institutions' sample was special on four point criteria involving long time experience in e-education; being recognized as amongst the leaders in distance and e-learning; regionally accredited; and proposing more than one degree through distance and e-learning.

The third stage involved a field survey, where staffs from the IHEP have visited the selected institutions and they measured the importance the 45 benchmarks are proposed by the literature. The results indicated that a number of the benchmarks resulting from the review did not gain the agreement of administrators, faculty staff and students, therefore the IHEP (2000) filtered the 45 benchmarks resulting from the literature review to 24 final benchmarks resulting from the field work survey, which was categorised into 7 groups as come in figure 3.5. The selection was founded on the ratings of existence and importance informed by the sample.

Thirteen benchmarks were eliminated, three new benchmarks emerged and some were combined as they addressed similar issues. The final set of benchmarks were categorised as follows: (Based on IHEP, 2000)

1. Institutional Support Benchmarks: these are described as "the issues, plans and incentives by the institutions that help to ensure an environment conducive to maintaining quality e-learning and distance education. Adding to this policies that encourage the development of internet based teaching and learning" (IHEP, 2000, p-19).

IHEP in 2000, highlighted issues such as documented technology strategies for the infrastructure development, shadowed through continuous assessment and evaluation to guarantee quality practices; maintaining top consideration of e-security standards to ensure reliability and validity of information;

ensuing a centralization management approach to support the building of an effective distance education infrastructure. (IHEP, 2000)

2. Course Development Benchmarks: these include "all essential elements for courseware development, which is produced largely either by individual faculty or by groups of faculty members" (IHEP, 2000, p-19). This category is a guideline for course designs, development and delivery that must be offered by the institution. The consequences of the course would reflect on the technology used for delivery and the course content must be lead regularly to guarantee it meets the program standards.

3. Teaching/Learning Benchmarks: these are defined by the IHEP (2000) as addressing "the array of activities related to pedagogy and the art of teaching, including interactivity, collaboration and modular learning" (IHEP, 200, p-19). The benchmarks of this category include the interaction services and facilities to easiness interaction between students, their colleagues and lecturers, students and administrators and should provide reasonable and non-threatening feedback to be delivered to students regarding their performance and assignments in sensible time; module assignments that need students to engage in analyse the content.

4. Course Structure Benchmarks: these are those policies and procedures that support and relate to the teaching/learning process. They include course objectives, availability of library resources, types of materials provided to students, response and reply time to students and their expectations. (IHEP, 2000). This category includes providing students with information that summaries the course objectives, concepts and ideas; sufficient resources to support their studies, such as libraries, guidelines about research methods and resources assessment, an introduction program to allow students to measure their abilities and motivation to whole the course.

5. Student Support Benchmarks: these are comprised of "the array of student services normally found on a college campus including admissions, financial aid as well as student training and assistance while using the internet" (IHEP, 2000, p-20). The benchmarks recommended in this category include students' training to access e-resources; written guidelines about the program; technical assistance to be available through the course; system to address students' complaints. (IHEP, 2000)

6. Faculty Support Benchmarks: these are "activities that assist faculty in teaching online, including policies for faculty transition help as well as continuing assistance throughout the teaching period" (IHEP, 2000, p-20). These benchmarks involve technical assistance for staff throughout course development; assistance to ease the change from classroom teaching to e-learning and distances-learning; continuous training during the implementation of e-learning programs; written resources concerning e-learning to be provided for faculty staff to assist in commerce with students' problems.

7. Evaluation and Assessment Benchmarks: these relate to the policies and procedures that address how, or if, the institution evaluated internet based learning; and included results assessment and data collection;

also, comprised multi-method assessments to examination the effectiveness of the program; data about costs and successful technology innovations; regular review of the program outcomes to guarantee clarity, utility and appropriateness (IHEP, 2000).

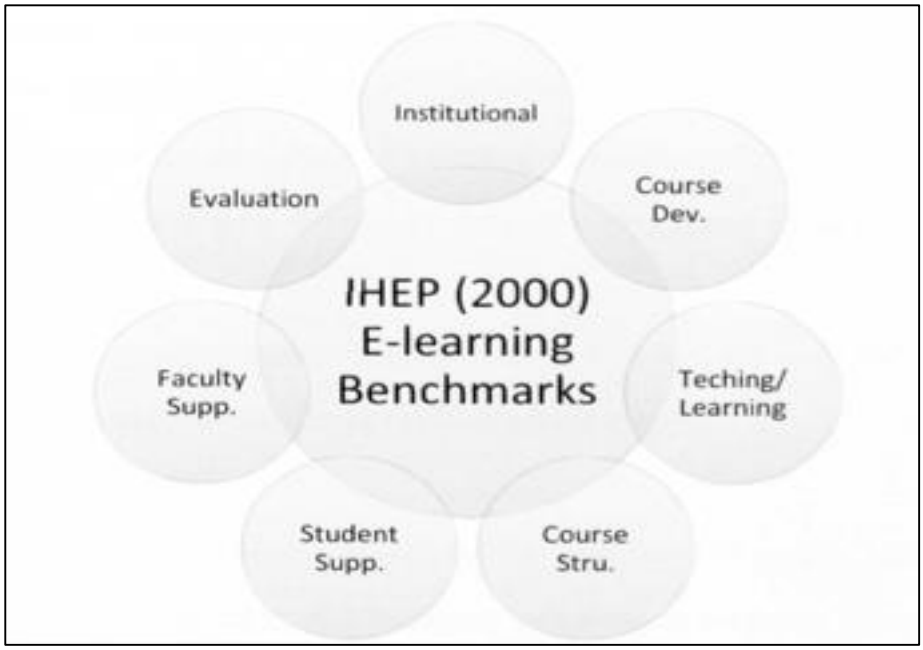


Figure 3.5: E-learning quality benchmarks. IHEP 2000

It seems through the top figure that it is worth mentioning that the methodology followed by the IHEP (2000) in classifying e-learning benchmarks was a well built one, and to some extent, the methodology followed in this research is similar to it.

3.8 Factors related to the implementation, development and evaluation of e-learning

This thesis aims to develop a suitable strategy to improve e-learning adoption, implementation and development in HEIs in Libya. No strategy can be devised unless its variables are identified (Hamdy, 2007). Hence, it is necessary to organise this comprehensive literature review to classify and identify the factors or CSFs affecting e-learning development and attempt to conceptualise those factors in a framework or model in order to be able to confirm its existence and determine it, because it is importance in the case of Libya. The literature review in previous discussion involved and focused on different factors that stress the development levels of adoption, implementation, development and evaluation of e-learning. However, there several other factors were raised through this review; there is evidence of an agreement between these studies on the existence and importance of convinced factors. The incidences of those factors amongst the studies reviewed are summarized up in next Table.

- The policies and strategies of the institution concerning adopting and implementing e-learning, including all factors of support and encouragement at various levels, could be clearly noticed through several studies (IHEP, 2000; Khan, 2001; Fresen 2005; Selim, 2005; Boezerooij, 2006; Bhalalusesa et al., 2013). All of

these studies emphasise the importance of the institution's role in supportive e-learning in terms of many faces such as: student support, faculty support, course support, course management, resources and evaluation.

- The pedagogical factors, in terms of course presentation, content structure, feedback management, student interaction etc., also gained the agreement among several studies (IHEP, 2000; Khan, 2001; Fresen, 2005; Bhalalusesa et al., in 2013).

- The technology factors, which have the most agreement of factors by all research in this area. This situation of agreement might be justified very simply by saying that, without passable technological infrastructure, the e-learning courses might be impossible.

- Also the design and presentation of the e-learning course materials was considered as a CSF, through most of the literature reviewed (IHEP, 2000; Khan, 2001; Oliver, 2001; Fresen,2005; Selim, 2005; Bhalalusesa et al., in 2013). Notwithstanding the different angles from which these studies approached the design factors, the final conclusion that could be made needs to place its emphasis on the importance and criticality of the design and presentation factors.

- The cultural framework that affects and influences the implementation and success of e-learning has been approached from numerous angles and at different levels through the literature review. IHEP (2000); Khan (2001); Oliver (2001); Fresen (2005); Bhalalusesa et al., (2013); approached cultural issues from the individual perspective, from other way, they focus on the importance of knowing the student, lecturer and technician readiness, ability and attitudes towards using technology in learning, in terms of their characteristics and how to reflect these characteristics in the system implementation.
From another angle, Bhalalusesa et al., (2013); Selim (2005) and Boezerooij (2006) considered the cultural variables as a whole, in terms of the demographical characteristics of the program users and in what way this affects success.
This approach may lead to a plan that the student, lecturer and technician and demographical factors address the general issue of cultural variables that have an effect on the success of e-learning.

Table 3.2: The different factors affect e-learning performance

Literature review of the categories		IHEP (2000)	Khan (2001)	Oliver (2001)	Fresen (2005)	Selim (2005)	Boezerooij (2006)	Bhalalusesa et al. (2013)	Total
Institutional factors		✓	✓	✗	✓	✓	✓	✓	**6/7**
Pedagogical factors		✓	✓	✗	✓	✗	✗	✓	**4/7**
Technology factors		✓	✓	✓	✓	✓	✓	✓	**7/7**
Design & presentation		✓	✓	✓	✓	✓	✗	✓	**6/7**
Cultural factors	***Student readiness***	✓	✓	✓	✓	✗	✗	✓	**7/7**
	Lecturer reediness	✓	✗	✓	✓	✗	✗	✓	
	Other factors	✗	✗	✗	✗	✓	✓	✓	

3.9 Chapter summary

This chapter considers as second part of the literature review of this study, which is included, a review of seven case studies as publications resources from different countries, which discuss the factors affecting e-learning development. The review presented an overview of each study and what factors were suggested through them. Also, an analytical review is conducted to check the existences of different factors between the seven studies reviewed. These studies have been overviewed by the modern order latest to oldest, from 2013 to 2000. All of these studies emphasis the importance of the institution's role in supportive e-learning in terms of many faces such as: student support, faculty support, course support, course management, resources and evaluation; and in what way they approach e-learning development. The next chapter will be discussing the methodology that used to manage this study and description the approaches of it.

Chapter 4: Methodology of Research

This chapter discusses the methodology used to conduct the fieldwork of this research to propose identify the research's problems and present the structure to how solve these problems in stages; each stage depend on rules and directions. According to Adam & Healy (2000), research methodology is the total approach used to investigate the issue of concern, and within that, the specific research methods and tools used to meet the declared research objectives. Adam & Healy (2000) consider methodology to be the procedures used for collecting and analysing the required data. In order to select an appropriate research methodology and decide on data collection techniques, a clear and explicit statement of the research aim and objectives is necessary. This information appears in Chapter One. The following sections explain the research philosophy, research strategy, research design and a description of the research, as well as a summary of these.

4.1 Research Philosophy:

The methodology of action research proposes a logical approach to introducing innovations in teaching and learning. It intends to prepare for this by setting the lecturer in the twin role of creator of the educational theory, and user of it. This is a technique of creating knowledge about higher education learning and teaching, and an influential technique of improving learning and teaching practice (Eickmann et al., 2004). No separation needs to be made between the design and delivery of teaching, and the process of researching these activities, thus provides theory and practice parallel together (Pernecky, 1963).

Porter Group (2015) write that, "*There are some researchers have seen action research coincidentally where is an individual or collaborative project*". Price (2011) emphasized that the lecturers could analyse the conditions and contexts of their classroom practice, which would help them to revise and change their teaching practice in a way that would suit their unique circumstances. The action research is "*an interactive method of collecting information that's used to explore topics of teaching, curriculum development and student behavior in the classroom"* (study.com, 2015).

The action research cycle allows the practitioners to design their activities based on their knowledge and previous feedback (see Figure 4.1). It is viewed as a spiralling or iterative process, with each cycle serving into the next. Beginning with the Plan-stage, the researchers determine the problem to be solved, the steps to be taken to solve the problem, and the methods to be used to evaluate how successful the solution has been. At Act-stage, the agreed steps are taken. Collect-stage is next, where the researchers collect data to determine whether change has occurred. At the Reflect-stage, the researchers analyse the data, discuss the findings, and determine to whatever degree the action has helped to solve the problem. As a result of this reflection, further planning occurs, to decide what needs to happen next, and the cycle begins again (Pernecky, 1963).

"*Through systematic, controlled action research, higher education teachers can become more professional, more interested in pedagogical aspects of higher education and more motivated to integrate their research and teaching interests in a holistic way. This, in turn, can lead to greater job satisfaction, better academic programmes, improvement of student learning and practitioner's insights and contributions to the advancement of knowledge in higher education*."
(Whitehead, J. (1980)

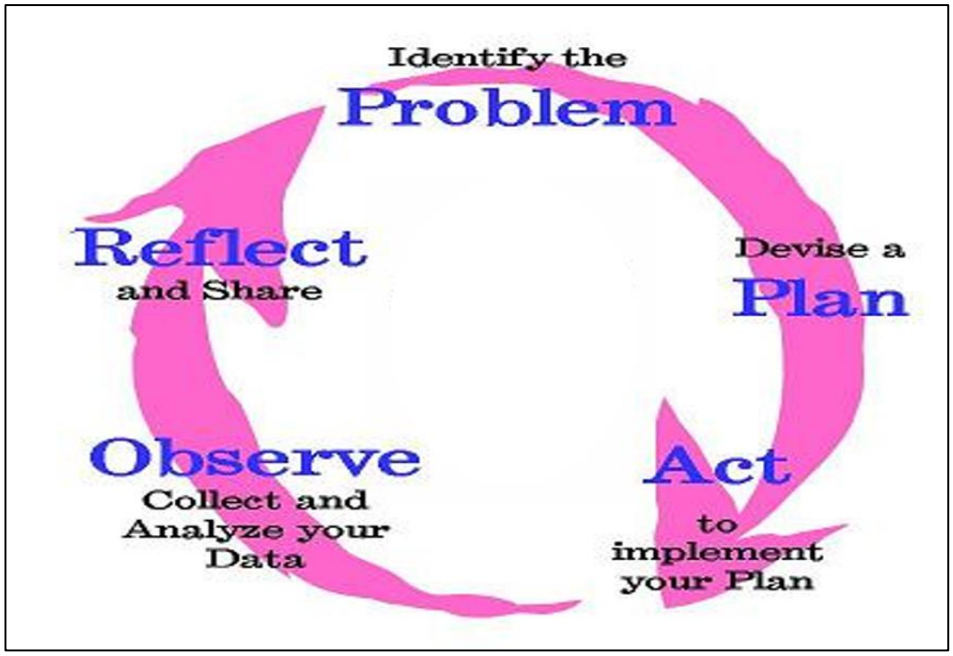


Figure 4.1: Action Research stages (study.com, 2015)

Notwithstanding progress in understanding the way in which people learn and the design of learning environments, teaching practice in HE frequently remains unaffected. Traditionally, the lecturers have not been encouraged to expand upon theoretical developments as a means of improving curriculum design and delivery (Khan, 2001).

The action research has been applied to the design, development and implementation of the e-learning package presented in this thesis. Then, conclusions for the improvement for the e-learning package in the next academic year have been derived after the evaluation of the proposed package by the experts and students. (Price, 2011 & Whitehead, 1977)

4.2 Research Approach

Collis & Hussey (2003) have classified the different stages (See table 4.1) of research into the following:

1: Defining the purpose of the research (the reason for conducting the research).

2: Determining the process of the research (the way in which data will be collected and analysed).

3: Assessing the logic of the research (whether the researcher is moving from the general to the specific).

4: The outcome of the research (whether the researcher is trying to solve a particular problem or make a

more general contribution to knowledge).

Table 4.1: The Strengths & Weaknesses of Positivist & Phonological Philosophies (Collis & Hussey, 2003)

Theme	Strengths	Weaknesses
Positivist (Quantitative paradigm)	- Can provide wide coverage of a range of situations. - Can be fast and economical. - Where statistics are aggregated from large samples, they may be of considerable relevance to policy decisions.	-Methods used tend to be rather inflexible and artificial. - Not very effective in understanding the significance that people attach to action. - Because of a focus on what has been recently, it may be hard for policy makers to consider what changes and actions could take place in the future.
Phenomenological (Qualitative paradigm)	- Data gathering method seen as more natural than artificial. - Ability to look at change in processes over time. - Ability to understand people's meaning. - Ability to adjust to new issues and idea as they emerge. - Contribute to theory generation.	- Data collection can be tedious and require more resources. - Analysis and interpretation of data may be more difficult. - Harder to control the pace, progress and end-points of research process. - Policy makers may give low credibility to results from the qualitative approach.

Table 4.1 describes two main methods that can be used in the research approach: qualitative and quantitative. While the qualitative approach tends to be associated with the phenomenologist paradigm, quantitative research tends to be linked with the positivist paradigm (Saunders, et al., 2003).

Table 4.2 presents the qualitative and quantitative aspects linked to the questionnaire design (Oppenheim, 1992). The quantitative and qualitative methods were used for data analysis from questionnaires. These methods complement each other in terms of answering the research questions and increase the research validity (Teddlie and Reynolds, 2000).

By this method could be assured the triangulation; whereas, Blaiki (1991); and (Adams, 2006) have confirmed that triangulation was essential to gather information qualitatively as well as quantitatively.

Table 4.2: Qualitative and quantitative characteristics. (Oppenheim, 1992)

Qualitative characteristics	Quantitative characteristics
The questions are open ended and the answers represent peoples' opinions	The questions are closed with definite answers
Data collection consists in classifying non standardised data into categories	Data collection is based on numerical and standardised data
Data analysis is conducted through the use of conceptualisation	Data analysis is conducted through statistics and charts

A - Quantitative research method

This method generally involves numerical data, which can be quantified to help answer research questions, and in the social sciences, normally takes the form of a questionnaire. Quantitative research is generally on a large scale, usually providing data that can be statistically analysed (Collis and Hussey, 2003). Examples of well-established quantitative methods include surveys and laboratory experiments, with the data obtained being analysed using formal and numerical methods, such as mathematical modeling using software like MS-Excel and the SPSS package.

B - Qualitative research method

This is based on methods of data generation which are flexible and sensitive to the social context in which the data are produced (Collis and Hussey, 2003). The nature of reality is defined by the interaction of the researcher with the phenomenon under study. Qualitative research usually emphasizes words rather than quantification in collection and analysis of data.

Qualitative data can be analysed by browsing, highlighting, coding, developing categories and reducing the information to a meaningful analysis (Creswell, 2005). In this research study, the response to open-ended questions were coded and analysed manually. The data was reduced to themes and then interpreted.

Muijs (2011) discussed realism, subjectivism and 'paradigm wars' between the quantitative and qualitative methods. The quantitative methods are based on numerical data which is statistically analysed so they are considered to be 'realistic' and 'positivist'. The qualitative methods are looking at non-numerical data so they are considered to be 'subjectivist'.

4.3 Research design

Three questionnaires were designed for the stakeholders in the School of Engineering at Tripoli University: teachers; students and technicians (see Figure 4.3) who could make useful contributions to the design, development and implementation of e-learning systems.

Each questionnaire contained four sections as following:

Section One – questions about the personal information of the respondents such as gender, academic qualifications, and the status of the employed persons in Libyan HE (answers were included the Appendix F).

Section Two – questions about the performance of e-learning systems in Libyan HEIs such as frequency of use for computer facilities (answers were analysed in Chapter 6).

Section Three – questions about the barriers to e-learning implementation in Libyan HEIs (answers were analysed in Chapter 5).

Section Four – contained open-ended questions (answers were analysed in Chapter 7).

Figure 4.2 shows the relationship between the method of research and different chapters of this thesis. The links between the analyses of answers for the different stakeholders were derived as follows: Number 1 - represented the relationship between the lecturers and students answers;

Number 2 - represented the relationship between the lecturers and technicians;

Number 3 - represented the relationship between the technicians and students.

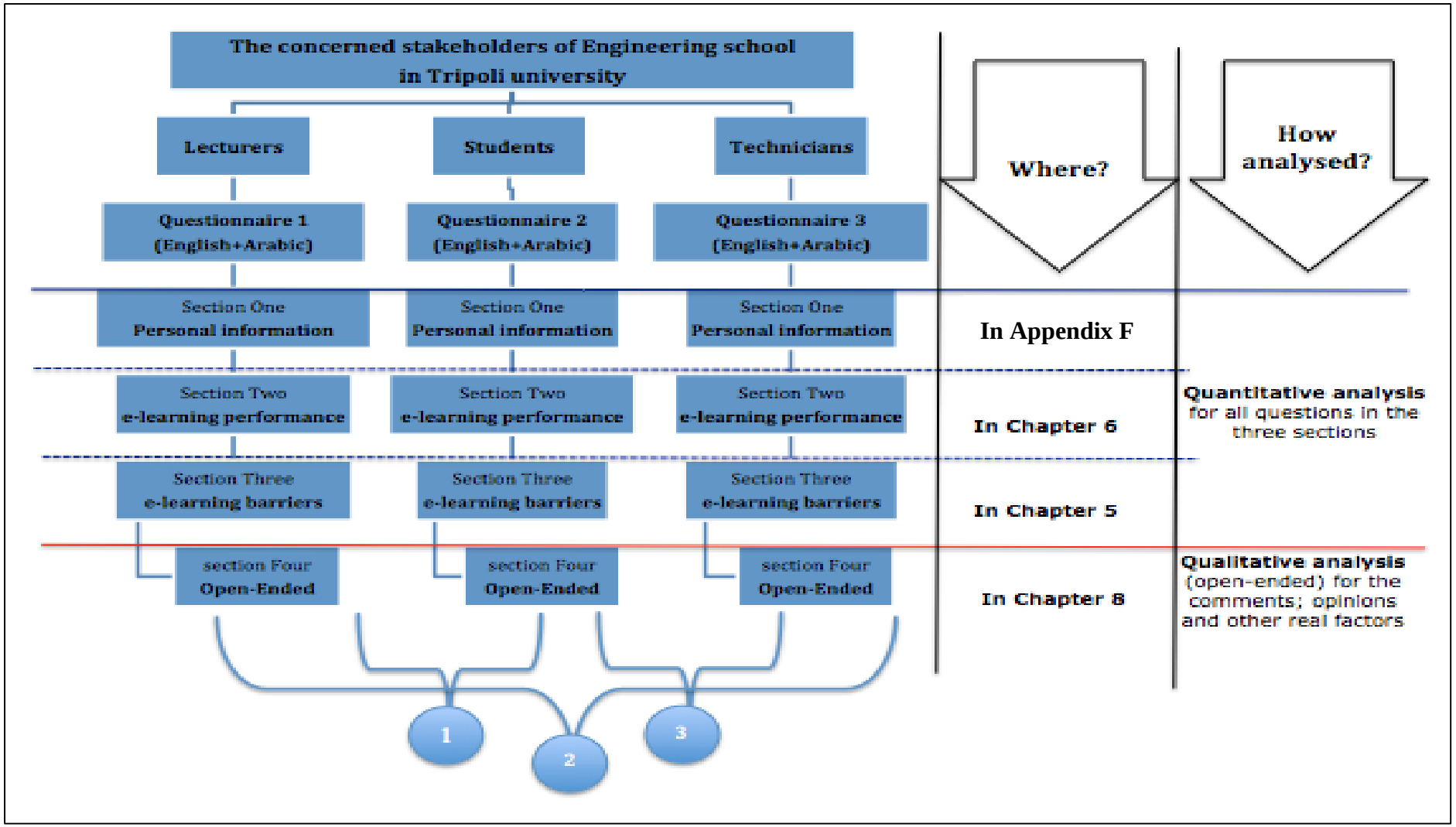


Figure 4.2: Relationship between the method of research and different chapters of this thesis

4.4 Justification for the Selection of Research Method

The questionnaire was a convenient data collection mechanism and is most commonly used in a survey strategy. Sekaran (2007) has offered a simple definition of a questionnaire as a written set of questions to which respondents record their answers. Gray (2009) defined a questionnaire as a set of questions designed to elicit data from respondents. From the discussion above it can be seen that the survey strategy is suitable given the nature of this study, its aim and objectives. The design of a questionnaire will affect the response rate and the reliability and validity of the data collected, which can all be maximized by paying close attention to the design of individual questions, ensuring the layout of the questionnaire is clear and giving an explanation of its purpose. The planning and execution of the administration of the questionnaire should be tested in a pilot study to remove any ambiguities (Saunders et al., 2003). As noted earlier, the survey strategy needs a large sample to obtain sufficient data for meaningful analysis. In the present case, postal questionnaires can be used, which have the advantages of:

- Economy: postal questionnaires are seen as offering relatively high validity of results because of their wide geographic coverage, and they are suited to assembling information at minimum expense (Cooper & Schindler, 2006).
- Speed: postal questionnaires are a quick method of conducting a survey.
- Consulting: in certain cases respondents may not have the information to hand, so a postal questionnaire allows them opportunity to seek the information before returning the response (Creswell, 2009).

The questionnaire is a set of questions and statements to receive the answers that are related to various topics and might be through by informal testing the draft questionnaire, revising and re-testing it, and concluding its parts and contents. (Oppenheim, 1992). The questionnaire should be designed in such a way as to participate the interest, encourage cooperation and extract reliable and truthful data of respondents (Curwin & Slater, 2008). Next drafting and construction; the simplicity of the questionnaires should be examined to eliminate overlapping ideas, evaluate the validity of the questions, and ensure that they reflect important elements (Cooper and Schindler, 2006); this stage is called the pilot study.

4.4.1 The design, development and implementation of questionnaires

The questionnaires have been designed after performing the critical review of the relevant publications and existing online surveys related to attitudes to e-learning. Also the questions were formulated base on the author's personal experience in dealing with administrative issues related to the implementation of E-learning in HE (including administration, educational objectives and course content). Informal discussions with colleagues interested in E-learning implementation in HE were also effective and helpful in the formulation of the questionnaires items.

The questionnaires have been completed in three categories of HE stakeholders (lecturers; students; technicians) even though there are more stakeholders for the School of Engineering at Tripoli University (see Figure 4.3).

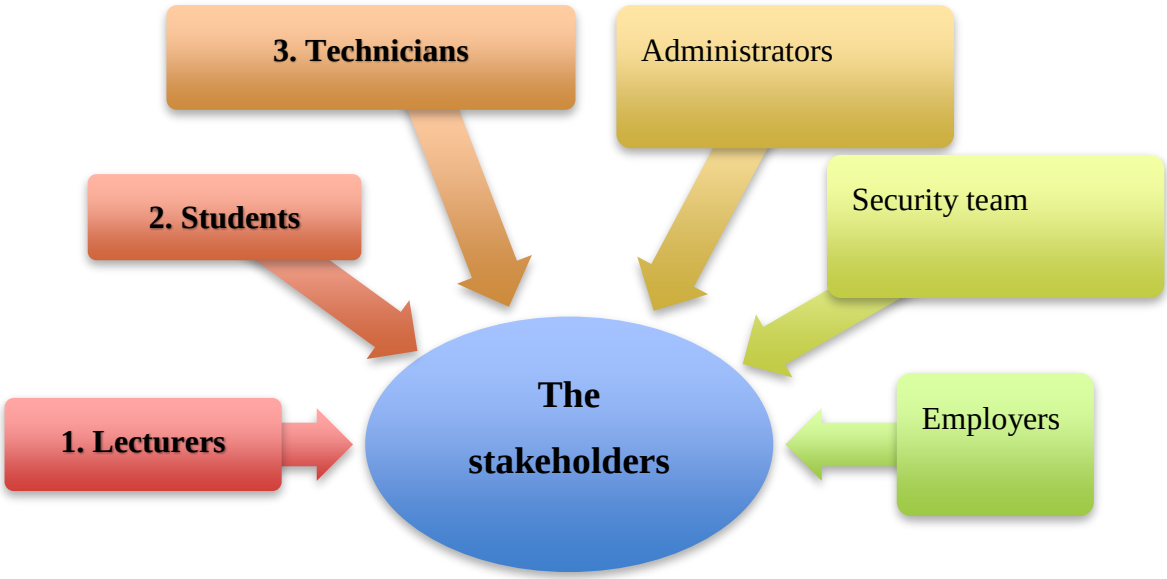


Figure 4.3: the stakeholders of Engineering School in Tripoli University

The official website for the Tripoli University is http://www.uot.edu.ly/. It has 1524 employees working and 4000 students from 17 different schools. The School of Engineering has 368 lecturers, 73 technicians and 448 students.

The researcher has sent the questionnaires via email and Facebook to 45 lecturers and 12 technicians. The lecturers have distributed the questionnaires to the 66 students studying at the Universities from Tripoli, Ezawia, Aljabal-Elgarbi, Al-Bedha and Benghazi. Other 37 people who are studying for Master and PhD degrees at University of Huddersfield, Salford, Manchester, Sheffield and Leeds have received the questionnaires for students. However they are teachers and lecturers in Libyan universities as shown in Table 4.5.

Table 4.3: Details of Libyan PGRs from UK universities who answered the questionnaires for students.

Libyan Universities	UK universities	Number of PGRs
Tripoli	Huddersfield	5
	Salford	2
	Manchester	1
	Sheffield	1
	Leeds	2
Ezawia	Huddersfield	3
	Salford	1
	Manchester	1
	Sheffield	0
	Leeds	0
Aljabal-Elgarbi	Huddersfield	0
	Salford	1
	Manchester	2
	Sheffield	1
	Leeds	1

Al-Bedha	Huddersfield	3
	Salford	0
	Manchester	1
	Sheffield	1
	Leeds	1
Benghazi	Huddersfield	3
	Salford	0
	Manchester	0
	Sheffield	1
	Leeds	1
Sabhaa	Huddersfield	2
	Salford	2
	Manchester	0
	Sheffield	0
	Leeds	1
Total of Libyan students in UK universities		37

The questionnaires were written in English and Arabic languages and Table 4.6 shows the distribution of students' answers.

Table 4.4: Details of the student groups.

Libyan Students	**PGRs in UK**	**BSc in Libya**	**Total**
Answers to the English version of the student questionnaire	25	11	36
Answers to the Arabic version of the student questionnaire	12	55	67
Total	**37**	**66**	**103**
From School of Engineering from Tripoli University	10	48	58
From other Libyan universities	27	18	45
Total	**37**	**66**	**103**

The questionnaires were designed by considering the issues of reliability (Cooper and Schindler, 2006), validity (Yorke and Knight, 2003), bias (Engelhart, 1973), triangulation (Adams, 2006).

Reliability - this could be described as the measurement tool of the consistency of questions. Hence, the questions should have reliable information, meaning that similar results could be obtained when using the questionnaire again (Cooper and Schindler; 2006). The questions integrated in the questionnaire should be designed with simple words to avoid ambiguity and to be easily understood and followed (Oppenheim, 1992). A clear sequence should be followed to structure the questions with an accurate plan to avoid confusion (Saunders et al., 2003). Ambiguous questions could be considered as threats to the reliability of the questionnaire.

Validity and bias - Validity has been described as accurate and clear questions statements contained in the questionnaire (Saunders el al. 2003). Therefore, the questionnaire validity is established by examining the content of the questions to safeguard that the questions would be expressed to measure numerous variables to find the questionnaire objectives. In other words, the questions should be un-biased (Kumar,

2010) in order to complete the purpose of the questionnaire.

Dependability - is reflected in the need to explain the nature of any change occurring in the social setting during the research period of time. It is the responsibility of the researcher to describe clearly the nature of any change in the studied context and how it influenced the way in which the research was approached (Yin, 2003). A lot of changes happened in Libya during the period of this research project (such as the civil war and the collapse of the political regime). This issue probably changed the attitudes of Libyans towards internet adoption and use, since people relied heavily on online media to report their concerns and get in touch with family and friends.

Ethical issues in educational research- ethical issues in academic and professional activity are increasingly receiving attention. In this study, ethical considerations were applied throughout the whole research process. Ethics touched on how to meet participants, handle data and how to develop appropriate research skills. As stated previously, a human is considered as the major instrument in data collection so s/he plays a vital role in qualitative research. Researchers in qualitative studies must be aware how to treat people who participate in their studies. The issue is thus critical in qualitative research. Hossain (2012) summarised the basic ethical considerations mentioned by Bazeley (2002) as follows:

- Informed consent: should be given to participants before starting data collection. Participants should be fully aware about the research background.
- No deception: researcher should avoid any kind of deception.
- Right to withdraw: the researcher should make it clear to all participants that they can withdraw from participating in the research project without causing any trouble for them.
- Debriefing: the researcher should guarantee that he obtains the required information, when s/he informs participants about the research objectives and ideally, might give them access to the research finding at the end of the research project.
- Confidentiality: the researcher should maintain confidentiality for the whole period of the research project with regard to any information related to the participants.

Hammersley and Traianou (2012) underlined that "*the prime ethical responsibility of the researcher is to pursue worthwhile knowledge; no other goal should be substituted for this, nor should it be compromised by other concerns unless this is ethically required as regards dealings with other people"*.

4.4.2 The analysis of answers for the questionnaires

The answers from the three questionnaires have been analysed by qualitative and quantitative methods (see Table 4.5)

Table 4.5: Questionnaires' analysis

Questionnaires	Section	Qualitative analysis	Quantitative analysis
Questionnaire 1 (Lecturers)	Section one	Q1, Q2, Q4, Q6,	Q3, Q6
	Section two	Q7, Q8, Q9, Q10	Q11
	Section three	Q14, Q15, Q16, Q19	Q12, Q13, Q17, Q18, Q20
	Section four		Q21 (Open-Ended)
Questionnaire 2 (Students)	Section one	Q1, Q2, Q5, Q8, Q9, Q10	Q3, Q4, Q6, Q7
	Section two	Q11, Q12, Q13, Q14, Q15,	Q16
	Section three	Q19, Q20, Q21	Q17, Q18, Q22
	Section four		Q23 (Open-Ended)
Questionnaire 3 (Technicians)	Section one	Q1, Q2, Q6	Q3, Q4, Q5
	Section two	Q7, Q8, Q9, Q11, Q13	Q10, Q12
	Section three	Q16, Q17, Q18	Q14, Q15, Q19
	Section four		Q20 (Open-Ended)

4.4.3 The pretesting for questionnaires:

Oppenheim (1992) says that the questionnaires pretesting should be carried out by experts who should indicate how long would it take to complete the questionnaire and assist to avoid ambiguity in the questions. A number of five llecturers, four students, and three technicians were selected randomly from School of Engineering at Tripoli University to pilot the questionnaires. Also six Libyan PGRs who are studying at universities from United Kingdom have been asked to pilot the questionnaires. Table 4.6 shows more details about the people who have piloted the questionnaires.

Table 4.6: Details about stakeholders who have piloted the questionnaires

The sample people	The department & the school	The numbers	The averages	The rank of age
Academic staff	IT scl. + Engineering Scl.	5	27.78%	30-55
Students	Engineering / Tripoli Uni.	4	22.22%	20-35
	Engineering+ IT / Britain Unis.	6	33.33%	35-45
Technicians	Engineering school	3	16.67%	35-45
The total		**18 respondents**	**100%**	**20-55**

The method for questionnaires pretesting was informal, individually-based expert review. The respondents made suggestions regarding avoiding negative questions and double negatives and to have a casual approach when formulating questions related to sensitive issues.

The questionnaires have been designed using Smart-Survey (a software package enabling the respondents to send their answers online).

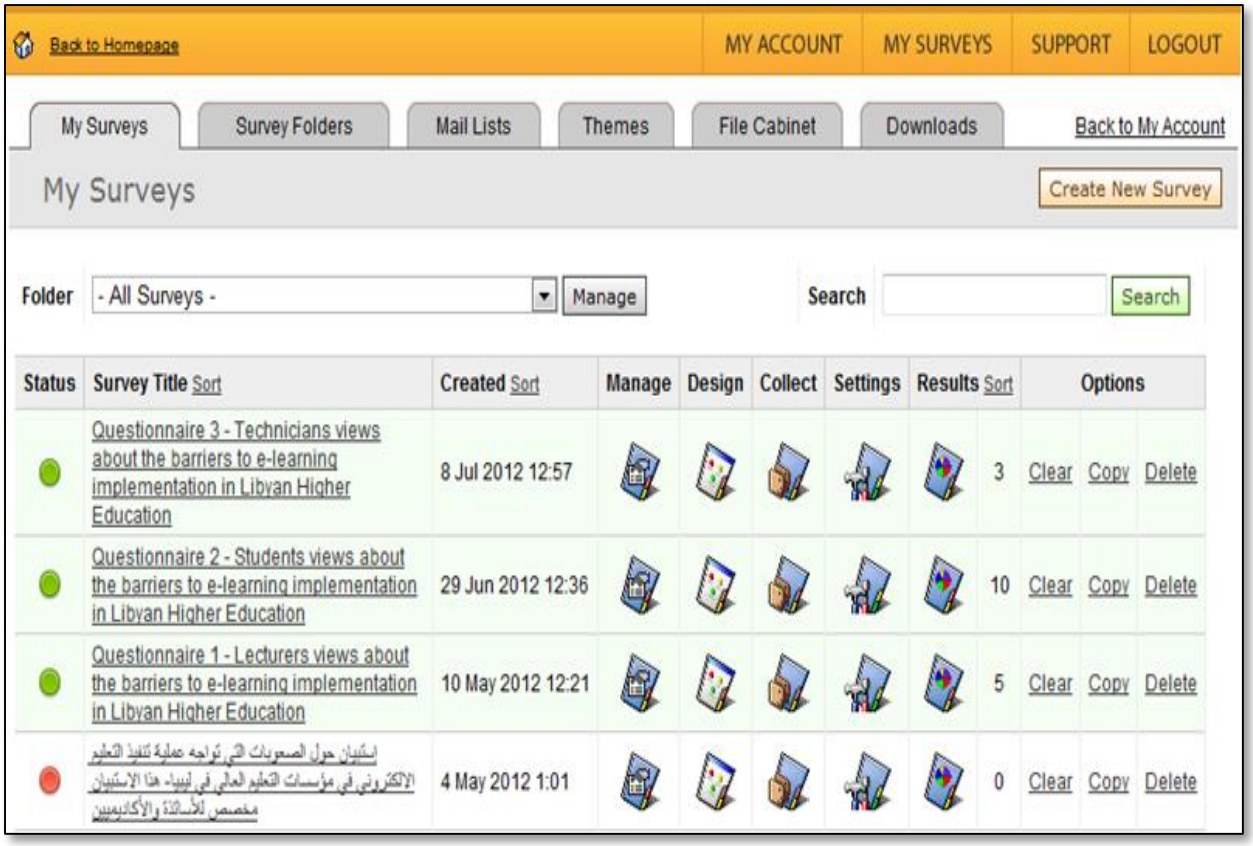


Figure 4.4: Picture from the Screen of Smart-Survey of Pilot Study Results.

4.4.4 The smart survey:

Smart-Survey (Smart Survey, 2013) is Online Survey Software designed to help users to create a survey, and then publish it online and view results graphically in real-time. There are many reasons for choosing the Smart-survey, which are as following:

- Easy to use without installations
- Completely Security
- Confidential work
- Viewing an overall summary of the results to a particular survey
- Viewing individual responses and read their unique comments
- Creating any and all charts, line graphs and more download the results to Word and Excel (CSV)
- Filter the results into various categories
- Designing the question types by wide range (Single/Multiple choice, Ranking, Rating Scales, Open-ended and much more)
- Academic design selects
- Sending the survey by Email to anyone anywhere or Share it on Facebook with colleagues and possibility launch it to database by use Mailing List system which will track each individual

The surveys are expected to provide findings that offer a better understanding in relation to the research objectives, which are to investigate the factors that students consider to be barriers to starting, continuing and completing online learning, as well as to explore existing e-learning approaches and practices. However, to investigate the lights points of SWOT model into build a suitable strategy to solve the barriers that faced improves the e-learning performance.

4.5 Quantitative analysis of data using Statistical Package for Social Science (SPSS)

The stages for the quantitative research analysis of the questionnaires were as follows: define the problem, determine what information is needed, question specification, sampling, data collection, statistical analysis and report. The statistical analysis of the answers for the questionnaires has been performed by using the Statistical Package for Social Science, (SPSS) version 21.
Connolly (2007, pp. 243) mentioned that "*SPSS can be used to gain a real feel for the data and an intuitive grasp of the main concepts and techniques involved. Drawing extensively upon up-to-date and relevant examples, the reader will be encouraged to think critically about quantitative research and its potential as well as its limitations in relation to education*".

The researcher has studied the SPSS syntax mode, exploratory data analysis for examination of single variables and pairs of variables and ways to export SPSS outputs for the effective presentation of results.

- From 0 to 0.80 represents (strongly agree) to each phrase except axis to be measured.
- From .81 to 1.60 represents (agree) to each phrase except axis to be measured.
- From 1.61 to 2.40 a (neutral) towards each phrase different depending on axis to be measured.
- From 2.41 to 3.20 represents (disagree) to each phrase except axis to be measured.
- From 3.21 to 4.00 represents (strongly disagree) to each phrase except axis to be measured.

For data measured using ordinal Likert scale, the length of the five scale cells (both low and high limits) which are used in the themes of the study, the extensity was calculated (5-1 = 4), and then divided by the number of cells of the scale to get the proper length of the cell which is (4 / 5 = 0.80). After that, this value was added to the least value in the scale (or the beginning of the scale that is a whole one) to determine the maximum limit of this cell, and thus the length of the cells became as follows:
Repetition and percentages were calculated to identify personal and occupational characteristics of the study members and to determine the responses of its members to the nominal data.

- "Median" was to see how high or low responses to members of the study on the ordinal statements (average of the phrases averages), knowing that its benefits in ordering the axes according to the highest average.
- "Independent Mann-Whitney" was used to determine significant statistical differences between the trends of the members of the study according to the difference in functional characteristics that is divided into two categories.

- "One Way Kruskall-Wallis test" was used to determine the significant statistical differences between the trends of the study according to the difference in personal, such as experience, that is divided into more than two categories.
- "Cross-tabulation and Chi-square test" was to test the relationship between function characteristics and nominal variables.
- "Pearson's Correlation Coefficient" was calculated to assess and verify the relationship between independent variables (age and experience) and variables of the study.

4.6 The questions numbers in the three questionnaires

In next table are all the questions of the three questionnaires. Some of them came through sharing questions and there are others that are private for each group of the sample (the stakeholders of Engineering School in Tripoli university). The sharing questions in section one have been used in Chapter 7; plus, the private questions for each questionnaire to conclude the relations between them. In table 4.7/a, b, c & d. (Ls) for the lecturers questions, (Ss) for the Students questions and (Ts) for the Technicians questions.

Table 4.7/a: The questions numbers in the three questionnaires

The questions of the three questionnaires	Ls	Ss	Ts
Section 1: Personal Information			
Age Categories	Q1	Q1	Q1
Gender	Q2	Q2	Q2
Qualification	Q3	Q4	Q3
In which school or faculty do you work?	Q5	Q6	Q4
Current educational level?	--	Q3	--
Do you study now?	--	Q5	--
How many hours do you teach per week?	Q6	--	--
Where are you studying? (Libya or UK)	--	Q7	--
Where do you prefer to perform your important job tasks?	--	Q8	--
How many hours do you spend using the Internet per day?	Q7	Q9	--
Do you have a job through your study?	--	Q10	--
What is your job role?	--	--	Q5
How long have you been working in this job?	Q4	--	Q6

The sharing questions in section two have used in Chapter 6 for SWOT analysis.

Table 4.7/b: The questions numbers in the three questionnaires

The questions of the three questionnaires	Ls	Ss	Ts
Section 2: About the performance of e-learning system			
Do you work as a team when solving the technical problems?	--	--	Q8
Do you work with a systemic strategy plan?	--	--	Q9
What are the needs of ICT Department when developing a Blackboard system?	--	--	Q10
What is your opinion about the link between the performance of ICT system and people who are in managerial positions?	--	--	Q11
Do you think that the use of online resources or ICT have added value to your lectures?	Q8	Q13	--
How do you contact the Academic staff and your supervisor?	--	Q12	--
In your opinion, what should be included in the contents of e-courses?	--	Q14	--
Please give your opinion about the following statements by ticking the appropriate box:	Q10	Q15	--
Which of the following do you consider as the most important element to achieve a successful E-learning implementation in Libyan Higher Education Institutions?	Q11	Q16	Q12
What is your opinion about these factors which affect the performance of Blackboard system?	--	--	Q13

The sharing questions in section three have used in Chapter 5, while section four was open-ended question has been analysed in Chapter 7,

Table 4.7/c: The questions numbers in the three questionnaires

The questions of the three questionnaires	Ls	Ss	Ts
Section 3: Barriers to e-learning implementation			
Which area creates the highest number of barriers to the practical implementation of E-learning systems in Libyan Higher Education?	Q12	Q17	Q14
In your opinion; which group has been the most resistant to the E-learning implementation in Libyan Higher Education?	Q13	Q18	Q15
Are you satisfied with the Internet speed in your university campus?	Q14	Q19	Q16
The cost of off-campus Internet access is:	Q15	Q20	Q17
How many IT training courses have you attended in this academic year?	Q16	Q21	Q18
What materials can you upload in the VLE (Virtual Learning Environment) systems (Blackboard) of your university?	Q17	--	--
Which resources (Audio/visual aids) do you use in the classroom?	Q18	Q22	Q19
Do you use the university's Email access?	Q19	Q11	Q7
What incentives or rewards have you received from your Institution?	Q20	--	--

The open-ended section was the section four in each questionnaire as following in table 4.7/d.

Table 4.7/d: The questions numbers in the three questionnaires

The questions of the three questionnaires	Ls	Ss	Ts
Section 4: The open-end Question. (This is optional section)			
Please include your personal views about any aspects related to the above-mentioned questions or about the practical implementation of the e-learning systems in Libyan Higher Education. Write your additional Comments	Q21	Q23	Q20

Table 4.8: The relationship of the questionnaires with the research questions

The research questions / The Questionnaires	**Q1** What are the advantages of e-learning that related to its practical implementation on the on the stakeholders?	**Q2** Does exposure to an e-learning environment improve students' thinking skills?	**Q3** What are the cultural elements that affect students' attitudes toward e-learning methods?	**Q4** What are the barriers to e-learning implementation in Libya?	**Q5** How would be building a new strategy for Engineering School in Tripoli university?
Questionnaire 1: for the lecturers	Q7 & Q8 & Q10 and Q21	Q8 & Q9 & Q10 and Q21	Q1 & Q4 & Q11 & Q13 & Q14 and Q21	Q12 & Q14 & Q15 & Q19 and Q21	Q13 & Q16 & Q17 & Q18 & Q20 and Q21
Questionnaire 2: for the students	Q9 & Q15 and Q23	Q10 & Q13 & Q14 and Q23	Q12 & Q18 and Q23	Q8 & Q11 & Q17 & Q19 & Q20 & Q21 and Q23	Q7 & Q16 & Q22 and Q23
Questionnaire 3: for the Technicians	---	-----	Q10 & Q13 & Q15 & Q18 and Q20	Q7 & Q8 & Q11 & Q14 & Q16 & Q17 and Q20	Q5 & Q9 & Q12 & Q19 and Q20

4.7 The link between the research questions and questionnaires

The research questions as came in chapter one as following:

- What are the advantages of e-learning that relate to its practical implementation on the stakeholders on Tripoli University?
- Does exposure to an e-learning environment improve students' thinking skills?
- What are the cultural elements that affect students' attitudes toward e-learning methods?
- What are the barriers to e-learning implementation in Libya?
- How would be building a new strategy for Tripoli university?

In this part, the researcher has explained how related these questions with the questionnaires questions, it is clarified in Table 4.8:

4.8 Chapter summary

As the results from this chapter suggest, there are many strategic approaches that a researcher may adopt in the researching field of social science. The research strategy is a way of going about one's research, embodying a particular style and employing different research methods. A number of issues have been considered in determining the optimum research strategy to satisfy the aim and objectives of this study. These are as follows (Remenyi et al., 1998; Saunders et al., 2003; Yin, 2003): the scope and nature of data required moving a theoretical assumption and concept into a particular methodology; also, the resource constraints such as the time and cost required undertaking the study; and the researcher's personal experience, knowledge and skills. Therefore, the research choices involve using quantitative and qualitative data analysis in this research project, after considering the research design, the nature of the sample of questionnaires and the collection data.

Next chapter contains the details about the barriers for the e-learning implementation based on the analysis of the answers provided by lecturers, students and technicians from Engineering School at Tripoli University.

Chapter 5: Analysis of the barriers for e-learning implementation in Engineering School at Tripoli University

This chapter presents the analysis of barriers related to successful e-learning implementation in Engineering School at Tripoli University in Libya. It describes the educational structure in Libya with regards to the ICT infrastructure, then the nature of the barriers are determined through a quantitative and qualitative analysis in the Section 3, based on the questionnaires completed by teachers, technicians and students (see Chapter 4 and the appendixes from A1 to C3). Also, this chapter presents a comparison of the barriers related to successful e-learning implementation in Libya, other Arabic countries and the United Kingdom.

Libya is located in North Africa and has borders with the Mediterranean Sea, Algeria, Tunisia, Egypt, Chad, Niger and Sudan. The land area is approximately 1.77 million Sq. km, and the estimated population was 6.3 million in 2010, with 78% of living in urbanized areas.

Around 97% of the total population are Arab and Berber, following the Sunni and Muslim religion (Hamady, 2007). Arabic is the formal language of the country, but people from the cities also speak English and Italian (SCAOMA, 2010). The literacy rate of Libya was 82.6% in 2003 and increased to 88.5% by 2010 (El-Hawat, 2011). Table 1 shows the relevant social economic information on Libya.

Table 5.1: Social economic information for Libya (El-Hawat, 2011)

The Indicators	**The information's**
Total population	6.3 million (2010 estimation.)
GDP	$ 60.35 billion (2009 estimation)
GDP-Per capita (PPP)	$ 13,400
Median age	Total 24.2 years
Literacy	Total population: 82.6% (estimation 2003) Male: 92.4%, Female72%
Telephone lines	1.033 millions
internet hosts	11,978 (estimation 2010)
internet users	323,000 (estimation 2009)

It is clear that Libya is playing an important role in the economic and electronic commerce between all African countries (Kenan, 2009). According to El-Hawat (2007) and EACEA (2011) there are three types of HE Organisations in Libya: Universities, Technical Colleges and the Higher Vocational Institutions. Said (2005) presents the five stages of the educational system in Libya (see Figure 5.1). This educational structure has existed in Libya since 1951, when Libya attained its independence. At that time the country did not have the stock of "trained human capital" necessary to enable the country to develop a course of self-persistent growth (El-hawat, 2005). There was also a severe lack of educational institutions to provide the supply of human resources. One of the legacies of the Turkish and Italian colonization of Libya is

educational backwardness, from which Libyan society still suffers EACEA (2011). Libyan HE was established in 1955 when the faculty of literature was created in Benghazi as an "uncle" for the Libyan University (Hamad, 2006).

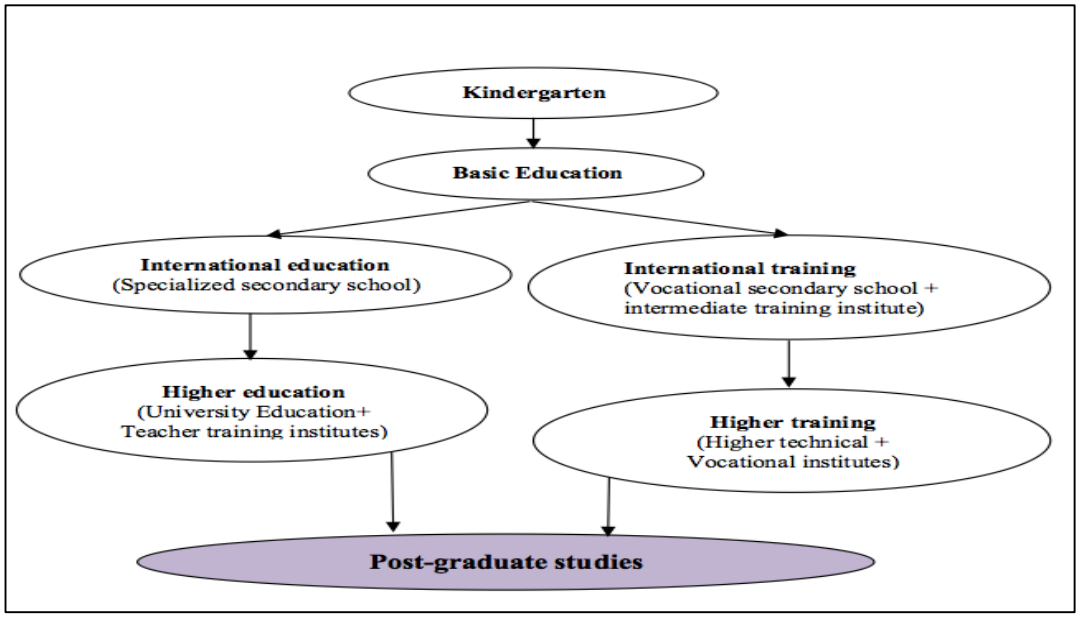


Figure 5.1: Educational structure in Libya (Said, 2005)

Libyan education is free for all students, and there are 1.9 million people enrolled in the various educational levels (Hamdy, 2010).

The Libyan government took measures during 1990s to encourage the usage of information technology in educational institutions and private and public organisations (Elzawi, et al., 2013A). The Libyan government has started a reform in 2000 regarding the adoption and effective use of information technology in Libyan Higher Education Institutes System (HEIS). However, there was still a low rate of access to the internet in Libya compared to the developed countries in 2012 (Kenan, et al., 2012B). Even today, the use of the internet technology across the country (especially in the educational sector) is low, despite the strategic plans formulated by the Ministry of Education in Libya.

Nowadays there are 17 government (public sector) and 53 private universities in Libya (Kenan, 2009). Benghazi University is the oldest, followed by the University of Tripoli (established in 1957), which is the largest. More than 52,000 students (63 % females) were enrolled at Tripoli University in 2010 (Libyan Higher Education Ministry Report, 2011). This University has several campuses in Tripoli and several colleges and institutes are associated with it. Therefore, Tripoli University is considered to be a role model in providing Higher Education (HE) in the country. There are more than 23 schools with 40 departments that offer degrees in a wide range of disciplines (engineering, computer science, medicine, etc.). There are 264 government-funded HE institutes in Libya that provide education in the areas of administration and management, technology, creative art, and teacher development. Eight other institutes – petroleum training and qualifying institutes – are dedicated to the training and education of personnel for the oil industry (Rhema & Miliszewska, 2010).

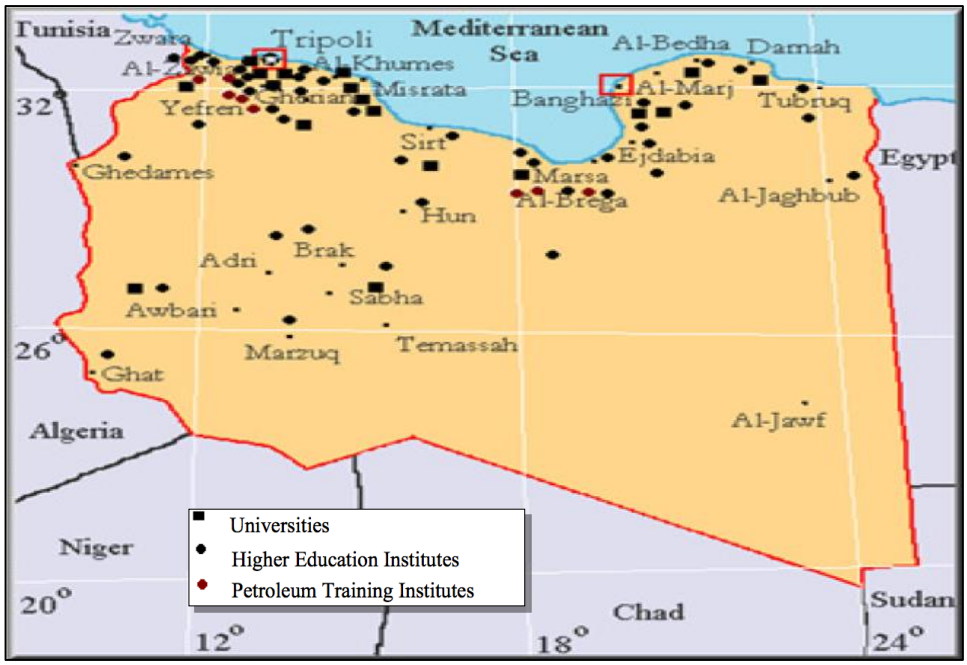


Figure 5.2: - HE Institutions in Libya (Rhema & Miliszewska, 2010).

5.1 Infrastructure of information and communication technology (ICT) in Libya

Since 2000, there has been an increase in interest in technology in many HEIs in Libya, and more institutions are spending more of their budgets on providing an ICT infrastructure (Porter and Yegin, 2006). Libya wants to match and compete with the standards of other countries' HEIs (Elzawi, et al., 2013B). This goal is part of Libya's move towards a knowledgeable society for which ICT is considered a prerequisite (Kenan, et al., 2012A). Figure 5.3 shows ICT penetration in Libya compared with neighboring countries, and it is clear that network provision and performance for fixed and mobile telephones remain a major challenge for Libya. The poor quality of the telephone network contributes to the reduction of internet usage. This will remain the case until the latest technology that allows PCs to communicate directly with the World Wide Web without a phone line becomes much more widely available in Libya (Porter and Yegin, 2006).

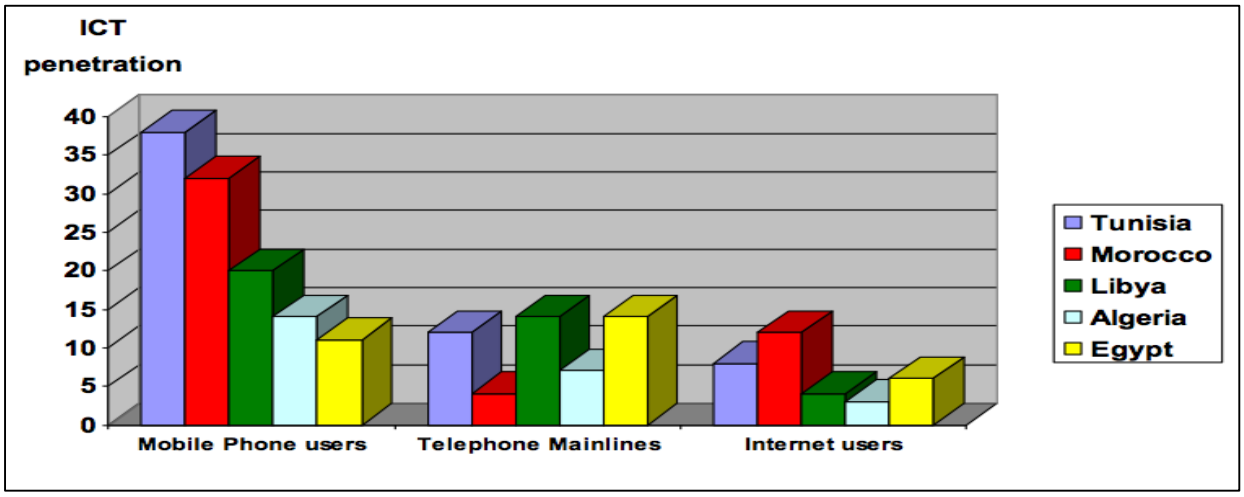


Figure 5.3: Comparison of ICT penetration in Libya with neighbouring countries (Kenan et al. 2010)

Basic education in Libya is well developed and literacy levels are among the highest in the Arab region. However, current education does not provide a "job-ready" work force because the education system is disconnected from the demands of the job market. Previous education policy decisions are having a negative effect in important areas of business such as IT and foreign languages. Also continuous professional development is almost non-existent (i.e. during its isolation Libya's doctors could not update themselves on developments in international healthcare on an ongoing basis (Kenan, et al., 2011).

5.2 Teaching and research in Libyan HE

A traditional teaching approach is used in Tripoli University, where the teachers provide all information and the students are passive learners. The economic, social, and political challenges of the Libyan society in the aftermath of its civil war have a huge influence on the educational system. However, Tripoli University has started a new programme to use technology in teaching along with the existing traditional approach, encouraging the academic staff to use the internet for the enhancement of their teaching, learning and research skills (Kenan, et al., 2013B).

- The annual increase of the number of enrolled students.
- Restrictions on financial resources and staff training.
- Administration mismanagement.

Kenan (2009) analysed the reasons why Libyan HEIs employ the traditional teaching approach:
In spite of the known weaknesses, the traditional teaching has provided teachers with the means to deliver the required course material to an ever-increasing number of students and provide those students with a clear-cut minimum of material so they can easily memorize it (Saheb, 2005). Therefore, HE students are not generally contributing to the learning process in the classrooms, they are only listening and taking notes. Furthermore, the use of new technology in Libyan HEIs (such as computers and multimedia in general) is far behind international best practice (Porter and Yegin, 2006). To involve students effectively in the learning processes, the HEI should adopt an "active learning" approach – whereby the students use resources outside the classroom, libraries, the world wide web, interviews or focus groups, to obtain information (MBNQA, 2004).

Tripoli University has made many positive steps in this direction. All departments in most schools have access to common rooms and facility labs, with modern computers advanced software packages and search engines useful for research activities. Also, the academic staff and postgraduate students can easily access the internet (Kenan, et al., 2014). It is possible to wirelessly access the internet network anywhere on campus via personal laptops or computers. Despite all these efforts, the average rate of internet adoption in the Tripoli University for communication, teaching, learning and research academic aims was extremely low (Al-Teer, 2006, Kenan, et al., 2013C).

5.3 E-learning implementation in Libyan Universities

Libya does not recognize distance learning and E-learning as a valid mode of education and most Libyan universities have not appointed staff members with formal qualifications in either distance learning or E-learning (Elzawi, et al., 2012A). Furthermore, there are no off-campus e-learning courses being offered by the Libyan Ministry of Higher Education. In fact, the Ministry of Higher Education (which is legally responsible for endorsing degrees from foreign universities) will not endorse a degree obtained through either distance learning or E-learning. Without the approval of the Ministry, students cannot gain any advantages in the workplace from their degrees. However, since 2003 there has been a dedicated centre for distance learning at Tripoli University, which provides a video-conferencing service enabling the students from various parts of the country to listen to the lectures. Also there have been online examinations (similar in structure to the theoretical part of the UK driving test) since 2005 and some universities use them in the assessment of the second stage of their courses. The public perception of distance learning and E-learning is mainly negative (Abozakher, 2006), and regarding the infrastructure, there is limited broadband to access the information in universities (Kenan et al., 2013A)

The commons belief is that distance learning or E-learning is of a lower quality than traditionally taught courses (Abozakher, 2006). There are some connections between the pedagogical, technological and attitudinal barriers related to successful e-learning implementation in Libyan HE as follows:

- Although most Libyan universities provide each faculty member with a personal computer, a significant percentage of faculty members are still computer illiterate, and one might reasonably estimate resistance from those members toward any attempt to adopt an E-learning model in their discipline within the university. Also, some of faculty members have difficulty with the English language since there is a lack of E-learning applications that support Arabic. Teaching E-learning courses would be nearly impossible for these staff, even for those who willing to do so. (Al-badree, 2007 & Elzawi and Wade, 2012)
- The lack of vision by university administrations' regarding the possibilities of E-learning is also a real challenge. University decision-makers fear that E-learning would abruptly shift traditional education into a new pedagogical venture for which educators and policymakers are not sufficiently familiar (Abouchdid and Eid, 2004).
- In Libya a strong power structure governs the relationship between learner and educator. Since the E-learner may feel subservient to the educator, this could prove a problem when the student is asked to discuss his/her views freely with the educator (Othman, et al., 2013B).
- The lack of Arabic learning tools and applications for E-learning courses will be a serious challenge for implementing E-learning into Libyan HE, particularly in the more theoretical colleges where the Arabic language is the teaching language (Artemi & Ajit, 2009). But even for the science-based colleges where English is the official teaching language, the lack of Arabic learning applications might cause a problem for the students (Khashkhush, 2011).

5.4 The barriers of E-learning implementation in Libya

The introduction of an e-learning program into the learning system in a specific country must take into consideration the social and cultural aspects of that society. The social and cultural background of the educator/lecturer and learner/student plays a significant role in determining the effectiveness of e-learning, and is thus one of the most important factors for the success of e-learning education. This importance differs from one society to another according to the values of the society, and its customs and traditions. Both active learning and e-learning encourages students to use various sources of knowledge, and persuades them to integrate and employ information efficiently, so that students are enabled to create questions and discuss new ideas inside working teams where information is shared towards achieving a common goal (Elzawi, 2008).

(Artemi & Ajit, 2009; Elzawi & Underwood, 2010; Rhema & Miliszewska, 2010) have classified the challenges linked to the implementation and use of e-learning and ICT in Libyan institutions into three categories: lack of ICT infrastructure; lack of qualified personnel, and resistance to change.
Kenan (2009) performed a study regarding the factors that act as barriers to starting, continuing, and completing e-learning courses. 63 teachers, students and technical staff from state and private Libyan HEIs were asked to complete a questionnaire. In terms of gender, 19.05% were females and 80.95% were males and their ages were between 19 and 48. The diversity of this sample allows it to be considered a representative sample for all sections of Libyan HE institutions. Kenan has grouped the barriers into four categories, based on the conclusions from her study and on her personal experience as an academic. These were: management barriers; technological barriers; cultural barriers, and barriers due to other factors, such as cost (see Figure 5.4). Kenan et al (2011) has compared the impact of e-learning and ICT in HEIs in Libya with United Kingdom and presented the possible ways of implementing successfully the e-learning and ICT in Libyan HEIs by considering positive UK examples.

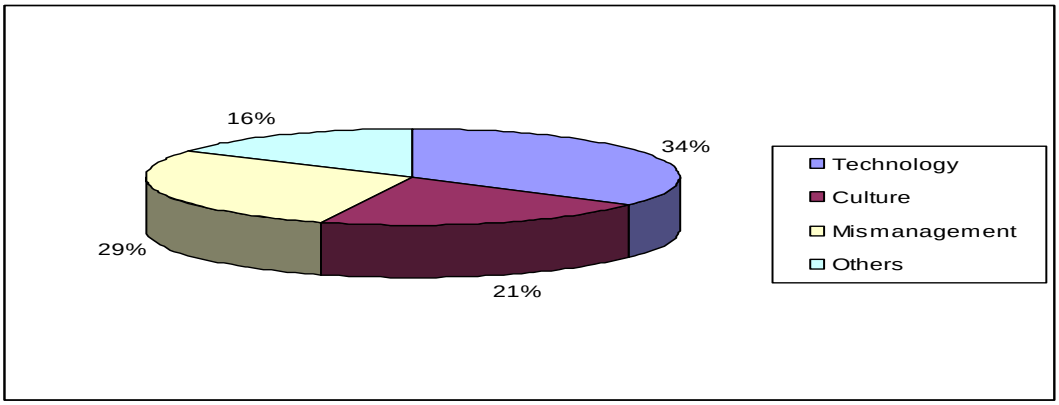


Figure 5.4: Barriers to E-Learning in Libya (Kenan, 2009)

As shown in Figure 5.4, the highest percentage for perceived barriers was technology, at 34%; this has an influence on educational processes and is related to the following: IT performance skills, design skills,

limitations linked to bandwidth, and the security requirements of IT systems (Kenan et al., 2011) The majority of Libyan learners do not have access to a personal computer or the internet. In addition, the ability to access the internet and the number of internet users differs widely from country to country (Zamsky and Massy, 2004)

The second highest percentage lies with mismanagement barriers, which have a percentage of about 29%. There are several issues which confront the implementation and use of e-learning and ICT in Libya, such as increased workload for academic staff, development time, delivery time, lack of strategic planning and vision, lack of training in technological developments, and lack of support for pedagogical aspects of the developments.

Thirdly, the cultural barriers have percentage of 21%. This includes factors such as religious beliefs and social customs or habits. In order to consider social factors or cultural challenges that could act as barriers to e-learning, one must find the reasons why people or individuals might prefer not to learn in an electronic environment (Kenan, 2009). Some of the reasons are issues such as: fear of demonstrating a lack of skill or competence, fear of technology, fear of isolation from other students, lack of awareness of the need to develop or the opportunities available, blaming others for inadequate performance rather than taking responsibility for one's own actions, lack of personal confidence, and a general belief that people cannot change. Therefore, fear poses a serious barrier to e-learning, because it is only through exposure and experience that one can master or be comfortable with e-learning (Twatti, 2006). Also, another major barrier to the introduction of e-learning into LHEIs is the lack of resources. It is sometimes said that Libyan institutions are spending large amounts of money on e-learning.

5.4.1 The barriers of e-learning implementation in Libya resulting from the current study

The teaching load in Libyan universities is typically large (i.e. the average number of teaching hours for academic staff is 24 hours/week), and Libyan universities have not yet established a scientific research tradition (Al-teer, 2006; Al-badree, 2007; Elzawi et al., 2012). Thus, the academic staff are allocated reduced number of hours for research activity and educational development.

Hamad (2006) points out that most research offered by Libyan universities is generally in the form of a 'research exercise' (i.e. dissertations introduced by students to obtain certificates, or by academic staff to complete the academic requirements for job promotion), which means that the goals of such research have not emerged from the real needs of society. The Libyan business executive survey/global competitiveness report (LBES/GCR) ranks Libya 97th out of 111 countries in university/industry research collaboration (Porter and Yergin, 2006). Nevertheless, some academic staff do undertake extra activities (such as writing and publishing, e.g. text books) to increase their income.

Several authors (Hamad, 2006; El-hawat, 2005; Al-badree, 2007; Artemi & Ajit, 2009; Kenan, 2009) show that post-graduate students in Libyan universities encountered the following difficulties:

- Lack of clear philosophy and objectives.
- Absence of effective administration.
- Lack of staff development courses in Libyan HE.

- Lack of a common policy (based on scientific and international criteria) regarding the acceptance of students onto a research degree.
- Shortage of research activities in science and engineering due the lack of necessary facilities.
- Ineffectiveness of postgraduate programmes and inability to realise their goals and objectives.
- Reliance on traditional teaching and assessment methods.

Accordingly, responsible bodies in Libyan HEIs should work towards adopting an effective strategic plan that considers and efficiently tackles the issues listed above. Naturally, achieving such a plan will require Libyan HEIs to create a network to enhance the flow of information and provide mutual support and co-operation. E-learning has the potential to be a significant part of the solution for these issues.

Highest barriers to e-learning implementation:

This section focusses on an analysis of the answers for the questionnaires which have been described in Chapter 4. The first analysed question was "*Which area creates the highest number of barriers to the practical implementation of E-learning systems in Libyan Higher Education?"* (Q12 – lecturers' questionnaire; Q17 – students' questionnaire; Q14 - technicians questionnaire – see appendixes' A2, A3, B2, B3, C2 and C3.

Table 5.2: Barriers to successful e-learning implementation from stakeholders' perspective

Barriers	Lecturers	Students	Technicians	The total
Technology	16	26	4	46
Culture	10	14	0	24
Mismanagement	19	51	8	78
Others	0	2	0	2
Total of the respondents	45	103	12	160

Table 5.2 contains the distribution of answers about the barriers related to practical e-learning implementation in Engineering School at Tripoli University. About 78 people (49% of total sample) have found mismanagement as being the most important barrier. It is obvious that the lecturers, technicians and students have considered the four types of barriers to have a balanced weighting, while the students perceived the mismanagement as the most important one.

Khashkhush (2011) has identified leadership support and strategy between the challenges related to the Libyan universities. However, these two challenges can be combined under the umbrella of the 'mismanagement' barrier. Figure 5.5 shows the distribution of barriers based on the number of people who have chosen the specific answer. More details about the distribution of these barriers are presented in Appendixes from A1 to C3.

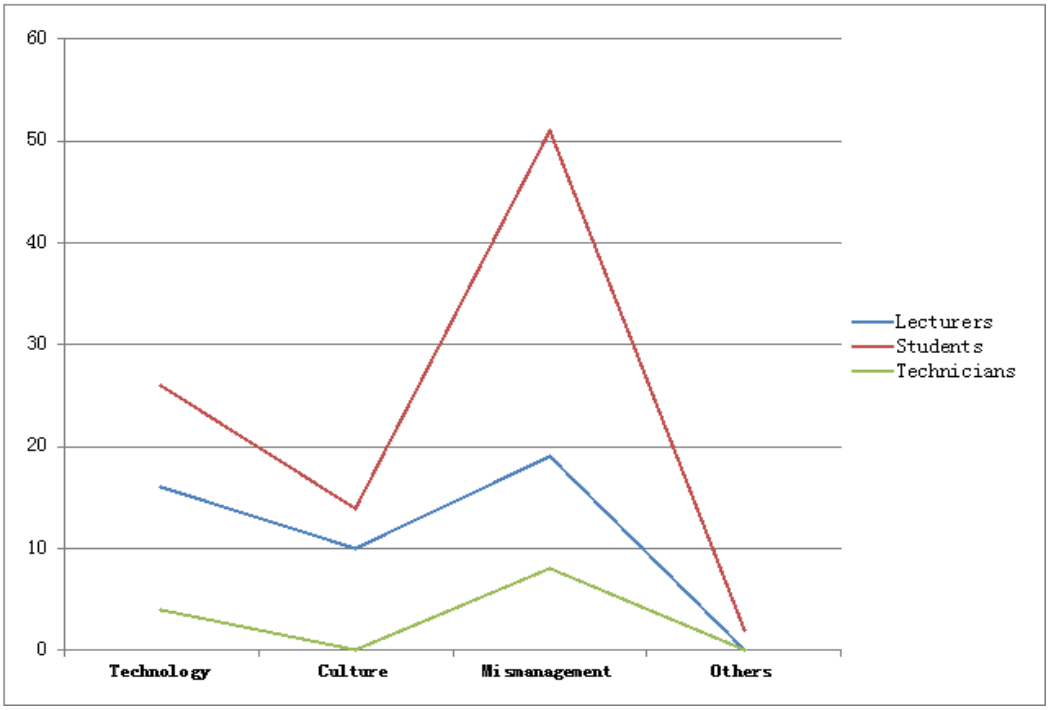


Figure 5.5: Distribution of barriers based on the number of people who have chosen the specific answer

Resistance to the E-learning implementation

The second analysed question was "*Which group has been the most resistant to the E-learning implementation in Libyan Higher Education?* "(Q13 – lecturers' questionnaire; Q18 – students' questionnaire; Q15 - technicians questionnaire – see appendixes' from A1 to C3).

Table 5.3: The most resistant group to the e-learning implementation

The most resistant group to the E-learning implementation	Lecturers	Students	Technicians	The total
Administrative staff	10	33	3	46
Students and researchers	4	5	1	10
Government team	20	43	7	70
Academic staff	5	15		21
Technical staff	4	4	0	8
Others (please indicate)	2	3	0	5
Total of the respondents	45	103	12	160

Table 5.3 shows that the stakeholders perceived that the government team is displaying the most resistance to e-learning implementation. This perception could be due to the lack of e-learning strategy, financial support, and official recognition of online degrees at the national level. The administrative staff group is in the second place regarding their degree of resistance to e-learning implementation, because the government team works closely with the administrative staff. These results can be connected to the answers for the previous question which have shown the 'mismanagement' as the highest barriers for the e-learning implementation. Figure 5.6 shows the distribution of answers related to the most resistant group to e-learning implementation.

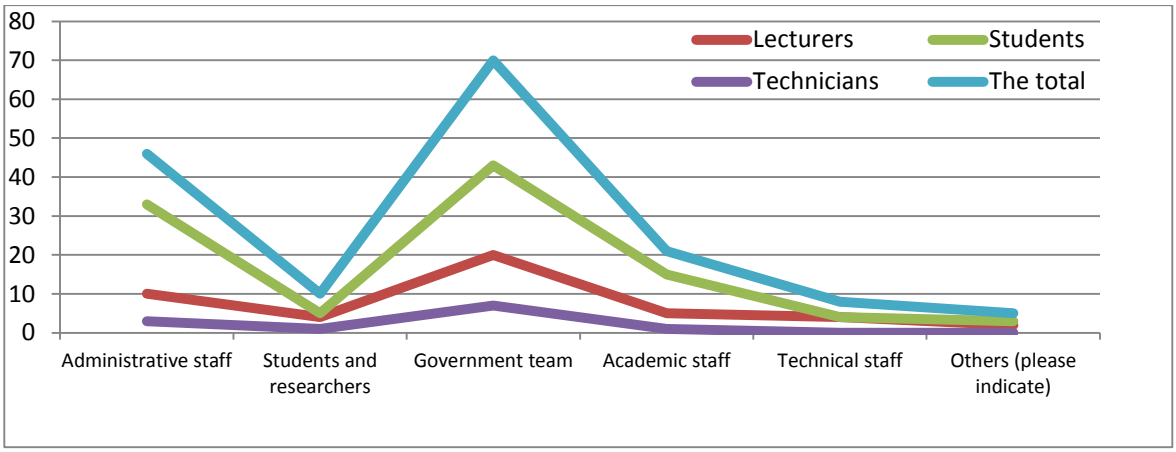


Figure 5.6: Distribution of answers related to the most resistant group to e-learning implementation

Satisfaction with the internet speed in University campus

The third analysed question was *"Are you satisfied with the internet speed in your university campus?"* (Q14 – lecturers' questionnaire; Q19 – students' questionnaire; Q16- technicians' questionnaire – see appendixes' A2, A3, B2, B3, C2 and C3).

The highest percentage of respondents (lecturers, students and technicians) were not satisfied with the speed of internet access, due to the digital gap and the low quality of infrastructure in Libya (more details could be found Section 5.5). This low speed of internet access is reducing the levels of students' satisfaction and motivation discouraging them to use ICT resources and e-learning systems.

Table 5.4 shows that 22 lecturers (48.8% from the total number of lecturers) were unsatisfied with the internet speed from Libya. A number of 26 students (72.22% of the Libyan students from UK universities) were satisfied with the internet speed 97% of the users from United Kingdom could access a 'standard broadband' service (meaning 75% for superfast connections or just 22% in rural areas) (ISP review.co.uk, 2015). In contradiction, a number of 43 students (64.18 % of the Libyan students studying in School of Engineering at Tripoli University) were unsatisfied with the internet speed (see Figure 5.7).

These results confirm issues related to the quality of the broadband networks in Libya in general according to the evaluation of the World Bank report in 2014.

Table 5.4: Satisfaction with the internet speed for School of Engineering from Tripoli University.

Options for answers	Lecturers	Libyan Students		Technicians
		UK	Libya	
Strongly satisfied	5	13	5	1
Satisfied	6	13	12	4
I don't know	12	1	7	0
Unsatisfied	13	3	28	4
Strongly Unsatisfied	9	6	15	3
Total of the respondents	45	36	67	12

Figure 5.7 shows a significant difference between the Libyan students who are unsatisfied with the internet speed depending on the country of study. Douglas McIntyre mentioned in 2014 that Libyan internet

connection speed is "*the slowest in the world at 0.5 Mpbs*" (McIntyre, 2014)

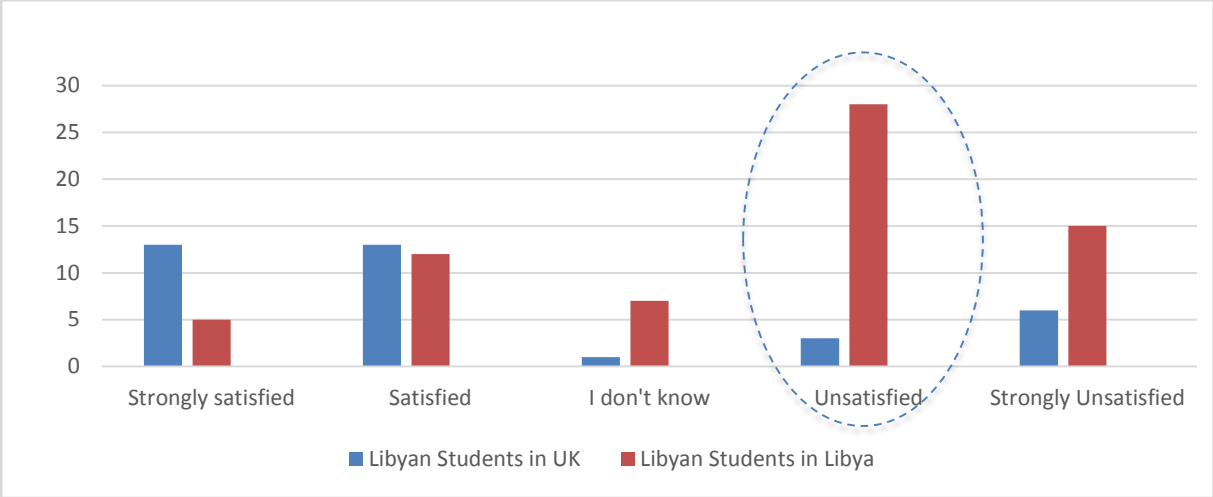


Figure 5.7: Satisfaction with the internet speed

The cost of off-campus internet access

The stakeholders were asked to *"Estimate the cost of internet off-campus access"* (Q15 – lecturers' questionnaire; Q20 – students' questionnaire; Q17- technicians' questionnaire – see Appendixes A, B and C).

Table 5.5 shows that 15 lecturers (33.33% of the total number of lecturers) and 34 students (50.74% of the total Libyan students from Tripoli University) found the off-campus internet access to be expensive because the broadband price as a percentage of Gross National Income (GNI) per capita per month is one of the highest from MENA countries (see Figure 5.12). The ITU values have been used in the World Bank report (2014), showing that Libya still in the level of retail broadband cost up to 10% of average from the monthly income or the Gross National Income (GNI).

Table 5.5: the cost of off-campus internet access

Cost of off-campus internet access	Lecturers	Students		Technicians	The total
		In UK	In Libya		
Highly expensive	3	5	8	1	17
Expensive	12	3	26	3	44
I don't know	20	7	8	1	36
Normal	9	18	24	5	56
Cheap	1	3	1	2	7
Total of the respondents	45	36	67	12	160

Figure 5.8 shows that 24 Libyan students (35.8%) consider the cost of off-campus internet access to be normal, even though the other 34 students considered it to be expensive, and the official reports show that the price of internet access is high in comparison with the salaries, due to war conditions and damaged ICT infrastructure. However, 18 Libyan students studying at UK universities (50 % of the total number of students studying in UK) have found the cost of off-campus internet access to be normal due to higher level of living in that country, and better quality of the ICT infrastructure.

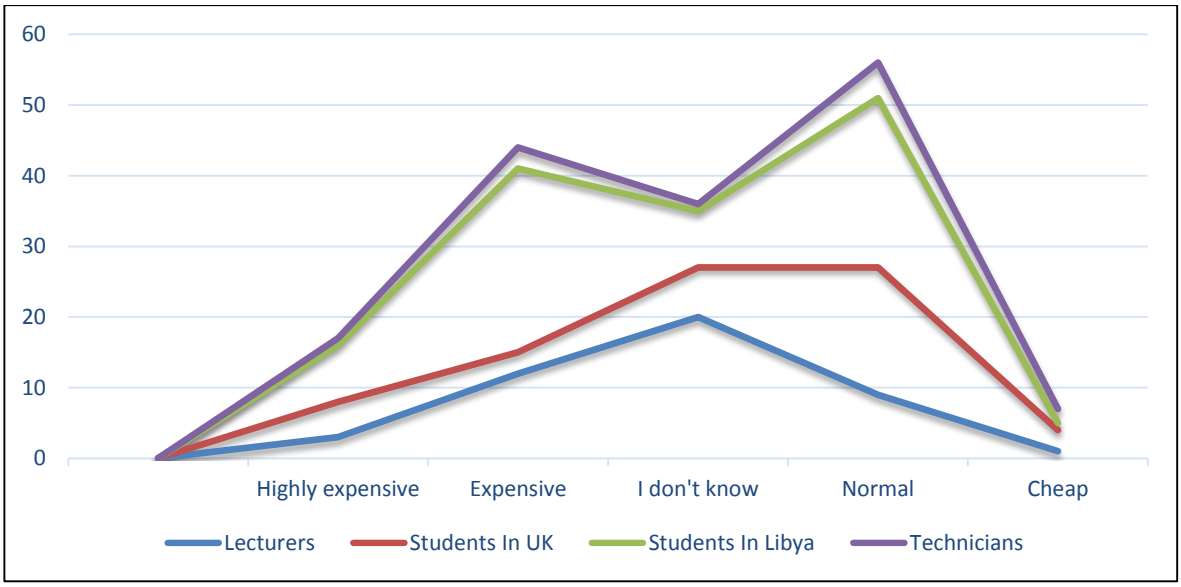


Figure 5.8: the cost of off-campus internet access

Attendance to IT training courses

The next analysed question *"How many IT training courses have you attended in this academic year?"* (Q16 –lecturers' questionnaire, Q21 – students' questionnaire, Q18 – technicians' questionnaire).

Table 5.6 shows that 25 lecturers (55.55% of the total lecturers) and 35 students (52.23 % of the total number of students from Tripoli University) and 6 technicians (50% of the total number of technicians) did not attend any IT training courses in that academic year. This may be due to the lack of training courses at School of Engineering at Tripoli University and possible lack of interest from the respondents to improve their theoretical knowledge and practical IT skills. On average, the median of attendance was ranging between 1-2 courses. Generally, there seemed to be a lack of IT courses. Median= 0 (1-2 courses)

Table 5.6: Attendance to IT training courses during academic year

The number of courses	Lecturers	Students		Technicians
		In UK	In Libya	
1-2 courses	9	13	27	3
3-4 courses	4	10	2	1
More than 4 courses	7	6	3	2
No courses	25	7	35	6
Total of the respondents	45	36	67	12

Upload the material in the VLE:

The next analysed question was "*What materials can you upload in the VLE (Virtual Learning Environment) systems (Blackboard) of your university*? " (Q17 – lecturers' questionnaire). Teaching materials, links to useful websites and answers to students' have been mainly uploaded by the teachers (see Appendix A1 and A2)

This reflects the lack of technical support for the lecturers to produce online materials including videos, animations. Also the use of VLE and e-learning systems is not included in the annual review of the teachers' performance. 5.7).

Table 5.7: Upload the material in the VLE

Q17. What materials can you upload in the VLE (Virtual Learning Environment) systems (Blackboard) of your university?		Response Percent	Response Total
1	Teaching materials	75.00%	21
2	Keywords.	21.43%	6
3	Videos.	17.86%	5
4	Links to websites useful for the course.	39.29%	11
5	Additional related questions.	21.43%	6
6	Animations.	3.57%	1
7	Answering the questions coming from students.	25.00%	7
8	Other, please indicate:	10.71%	3

The university's Email access

The next analysed question was: "*How often do you use the university's Email access? "* (Q19 – lecturers' questionnaire; Q11 – students' questionnaire; Q7 – technicians' questionnaire).

22 lecturers (48.8 % of the total number of lecturers) accessed the email on a regular basis showing that email is a popular way of communication between stakeholders. However 11 lecturers (24.4 % of the total number of lecturers) and 33 students (49.25 % of the total number of students at Tripoli University) and 5 technicians (41.66% of the total number of students) mentioned that they did not have email access. Hollings Centre (2014) discussed the poor IT Infrastructure at Tripoli University, because Libya still lags in internet connectivity and computing infrastructure.

Table 5.8: the university's Email access

Options for answers	Lecturers	Students		Technicians
		In UK	In Libya	
Yes, regularly	22	23	10	5
Sometimes	12	4	11	2
I don't have this access	11	6	33	5
Not at all	0	3	13	0
Total of the respondents	45	36	67	12

The (Audio/visual aids) resources in the classroom

The next analysed question was: "*Which resources (Audio/visual aids) are been used in the classroom?"* (Q18 – lecturers' questionnaire, Q22 – students' questionnaire; Q19 – technicians' questionnaire).

Table 5.9: The (Audio/visual aids) resources in the classroom

(Audio/visual aids) resources in the classroom		Lecturers	Students		Technicians
			In UK	In Libya	
1	Chalk on board.	15	3	3	2
2	Flip chart or Marker-board	22	30	52	5
3	Projector	18	26	36	6
4	Computer for presentation	13	19	32	3
5	Internet connection by cable	3	35	4	3
6	Internet wireless connection	1	33	5	2
7	Smart board	3	11	2	0
8	Other, please indicate:	0	0	0	0
The total		45	36	67	12

22 lecturers (48.88 % of total number of lecturers) and 30 students (83.33 % of the total number of Libyan students studying in UK universities) and 52 students (77.6 % of total number of students from Tripoli University) opted for the use of flip charts and white boards with dry marker pens as the most preferred audio-visual resources in the classroom. Figure 5.9 shows the students' preferences for audio-visual resources and the variety of teaching resources which are available in UK universities (i.e. internet connection by cable or wireless, smart board, etc.)

It can be observed that the transition from the traditional method of teaching by using chalkboards to the use of flip charts, white boards and projectors. So the audio-visual resources start to be used more in the lectures but there is a lack of broadband connection and slow internet access. Hollings Center report (2014) discusses the high speed undersea cable, which connects Libya to the global system through Tripoli, and the plans to develop the mobile broadband access in order to catch up with the levels of access from European countries.

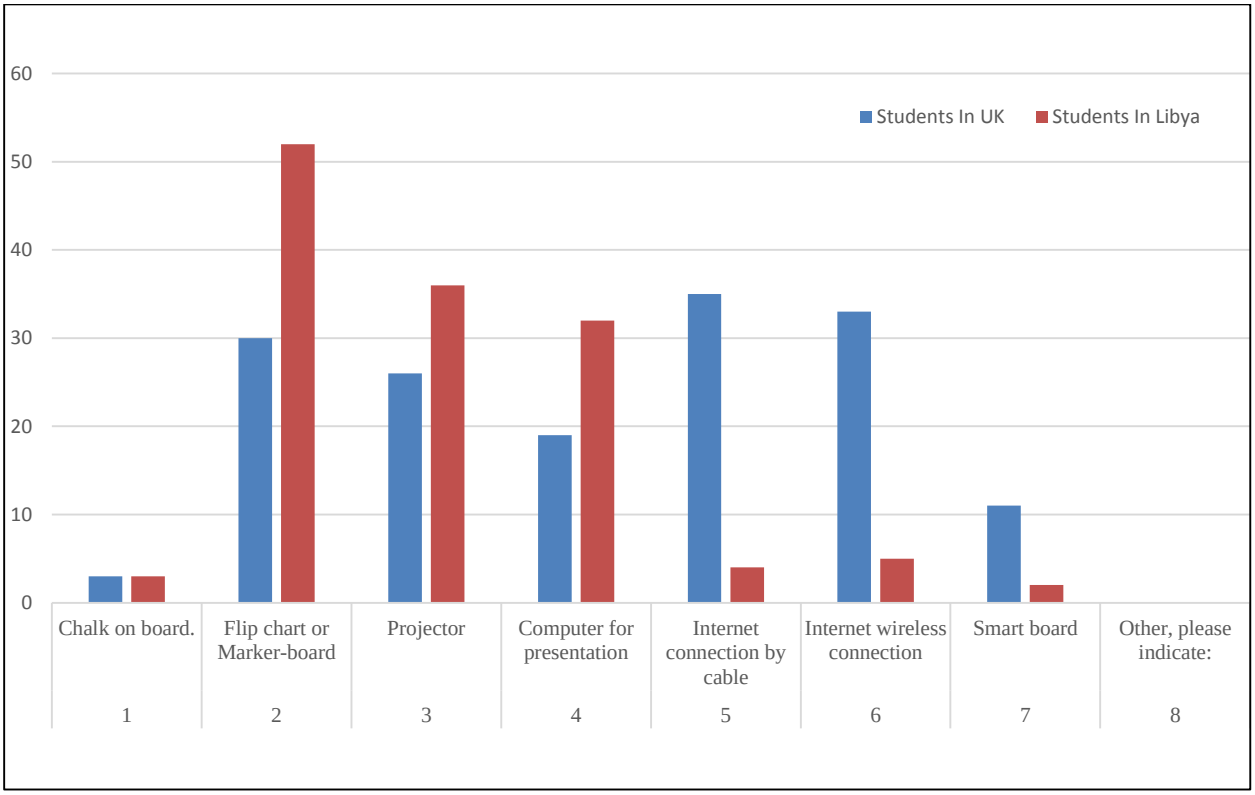


Figure 5.9: Students' preferences for Audio/visual resources in the classroom

Based on the analysis of the stakeholders' answers for the questionnaires and the lecturing experience of the researcher, it can be concluded that implementation of e-learning systems is still in its early years in Libya (Kenan et al., 2012B). Although the initial introduction of e-learning opportunities in HEIs seems to be successful, there are still many challenges that might prevent the general adoption of e-learning in Libyan Higher Education. These barriers for the e-learning implementation in Libyan HE can be divided in three main categories as follows:

A. Technological resistance:

- Insufficient network and systems infrastructures.
- Weaknesses of E-learning development in HEIs.
- Difficulties in overcoming initial implementation problems.
- Lack of experience in using technology.
- Lack of provision of robust internet access.
- Lack of specific student services

B. Cultural resistance:

- Unfamiliarity with the internet and related technologies results in a lack of appreciation and understanding of E-learning and its benefits.
- Opposition to the adoption of the necessary educational changes (e.g. self-regulation, student centered) required for successful E-learning.

C. Management issues:

- Lack of a general strategy of education linking the different stages of study.
- Lack of common regulations or standards for e-learning
- Disapproval from the Ministry of Higher Education for e-learning courses.
- Difficulty in securing accreditation collaboration.
- Lack of cross-institutional collaboration.

Other authors such as (Al-badree (2007), Kenan et al., 2011; Elzawi, et al., 2012; Rhema, et al., 2013) have mentioned these three main categories, but they have divided the barriers in different ways.

5.5 Barriers related to the e-learning implementation in the Middle East and North Africa (MENA) countries (As close culture)

In March 2013, Gulf Bridge International (GBI) launched the first underground cable connecting the Gulf to Europe. The terrestrial link was established through a landing station in Al-Faw, Iraq, crossing Iraq, Turkey, and onwards to Frankfurt. (See Figure 5.10)

In just five years GBI has created a cable system improving the connective capacity and resilience of the Gulf region. GBI has created a new model for the expansion of fiber-optic networks in the Middle East that can be replicated in other countries and areas of the region. GBI indicated the great potential of the Middle East in terms of broadband development and the high capacity demand of the region's population. In addition, GBI stated that the Gulf was evolving into a global hub for high capacity data transmission. In this respect, GBI's model can be extended to the Mashreq and North Africa regions in order to improve both intraregional and international connectivity (World Bank, 2014).

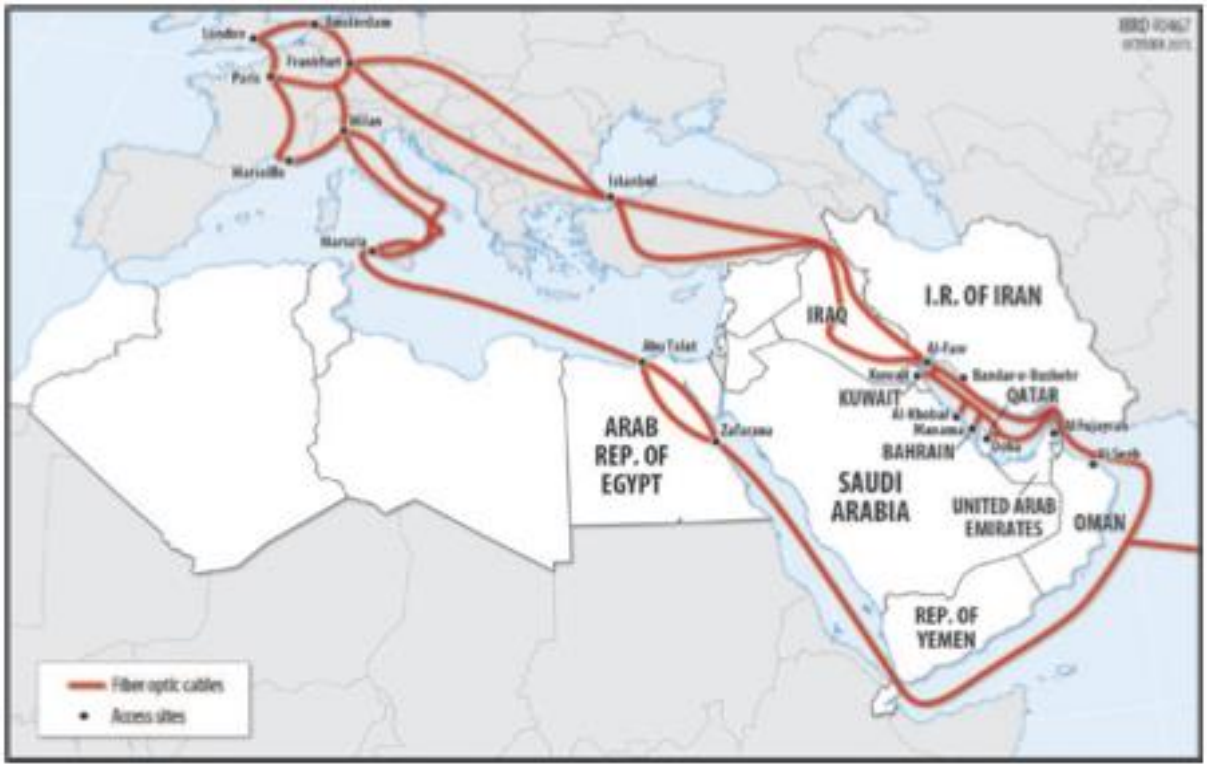


Figure 5.10: Fiber-optic networks: Gulf Bridge International. (World Bank, 2014)

This is coming as result to request the Gulf governments and many strategies to improve the infrastructure, telecommunications networks and the performance of the e-government, e-business and e-education. But lack of competition and limited open access regulations pose significant constraints to the effective use of international and regional connectivity infrastructure in most of the MENA countries. For just 13 out of the 19 countries under consideration in MENA, access to international submarine cable connectivity is under the sole control of the incumbent operator (World Bank, 2014).

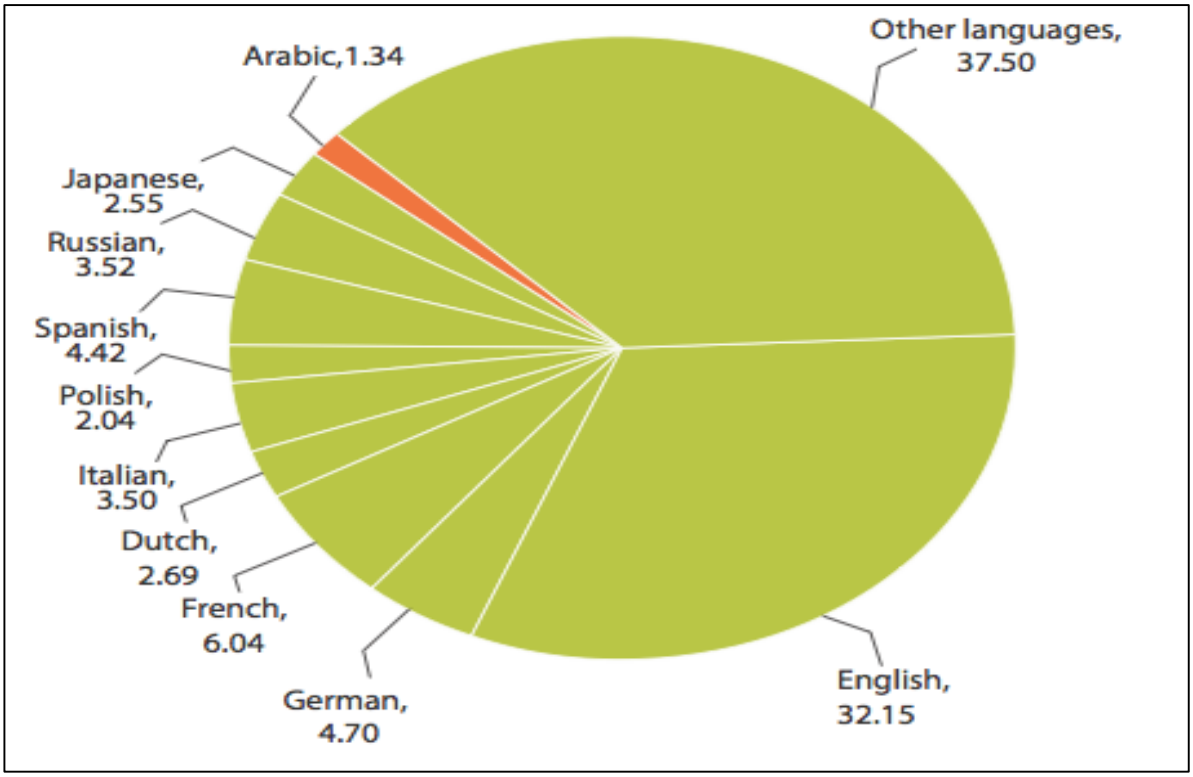
Other study shown, the Saudi Arabian Communications and Information Technology Commission conducted a study (CITC, 2007). The answers from 7,500 individuals revealed that only 49% of society members are aware of e-learning, while only 5% of those who are aware of it have ever personally used it. There were several reasons why the governments from MENA adopted a passive attitude towards e-learning. The most important reason was the very low internet penetration rate by the general public (Al-Kahtani et al., 2005) due to high initial costs associated with internet access, low speed and quality internet connections, and the fear that internet connection would bring-about immoral values and corruption to the family (Twatti, 2006).

Also, the conservative religious clerics were continuously warning of the dangers the internet will bring to the society and many people adhered to the warning (Elzawi et al., 2013A). Additionally, the learner's attitude and lack of prior knowledge of IT use are major factors that affect the acceptance of e-learning by students (Selim, 2005). Another important reason behind the hesitation of many university academics to resort to e-learning is the low public esteem for online learning. The online degree is seen to have less job

opportunities and is not comparable to traditional degrees (Kenan et al., 2012C). Yet one more cause for not rushing into the adoption of e-learning in the MENA is the great lack of online repositories that contain educational material in the Arabic language (Al-khalifa et al., 2010). A large percentage of faculty members may not be capable of creating such material, and hence courses would not lend themselves to e-learning. Training and workshops are recommended to bridge the technology gap and improve faculty self-perception (CITC, 2010). Scientific programs such as computing sciences, medicine, and engineering may be more applicable to e-learning in the ME, since most scientific colleges teach their courses in the English language, and hence, electronic course material may be more readily available (Al-khalifa, 2010)..

World Bank (2014) published a report regarding the broadband networks in the MENA countries accelerating high-speed internet access and the digital content of languages is a main source for knowledge to build a communal capable for the competing in the fields of IT and science. Arabic digital content amounts to just 0.162% of the total digital content available online; this international language gap, even inside the MENA region itself only 42% of all webpages are published in Arabic. Furthermore, the number of websites hosted in the MENA region amounts to only 0.198% of the global total. To draw an even clearer picture, figure 5.11 below indicates that only 1.34% of articles published in Web-pages are in Arabic. It directly limits access for a large number of people in the MENA region and bounds their ability for online learning and knowledge sharing.

Figure 5.11: The percentage of Arabic Articles and other languages on the Webpages through 2013 (World Bank, 2014).



the

However, the cost of broadband service plays a critical role in terms of broadband diffusion. According to the International Telecommunication Union (ITU) in 2013, broadband penetration grows rapidly after the level of retail broadband cost falls below 3–5% of average monthly income or the Gross National Income (GNI). In the MENA region, fixed broadband cost constitutes about 3.6 percent of the average monthly income per capita, while mobile broadband costs stands at about 7.7 percent. While Djibouti, Syria, the Republic of Yemen and Libya are significantly above the 5% threshold, a number of countries (Algeria, Egypt, Jordan, Morocco, and Tunisia) and above the 10% threshold, a number of Libya, have just reached the level that makes rapid broadband takeoff possible (see figure 5.12).

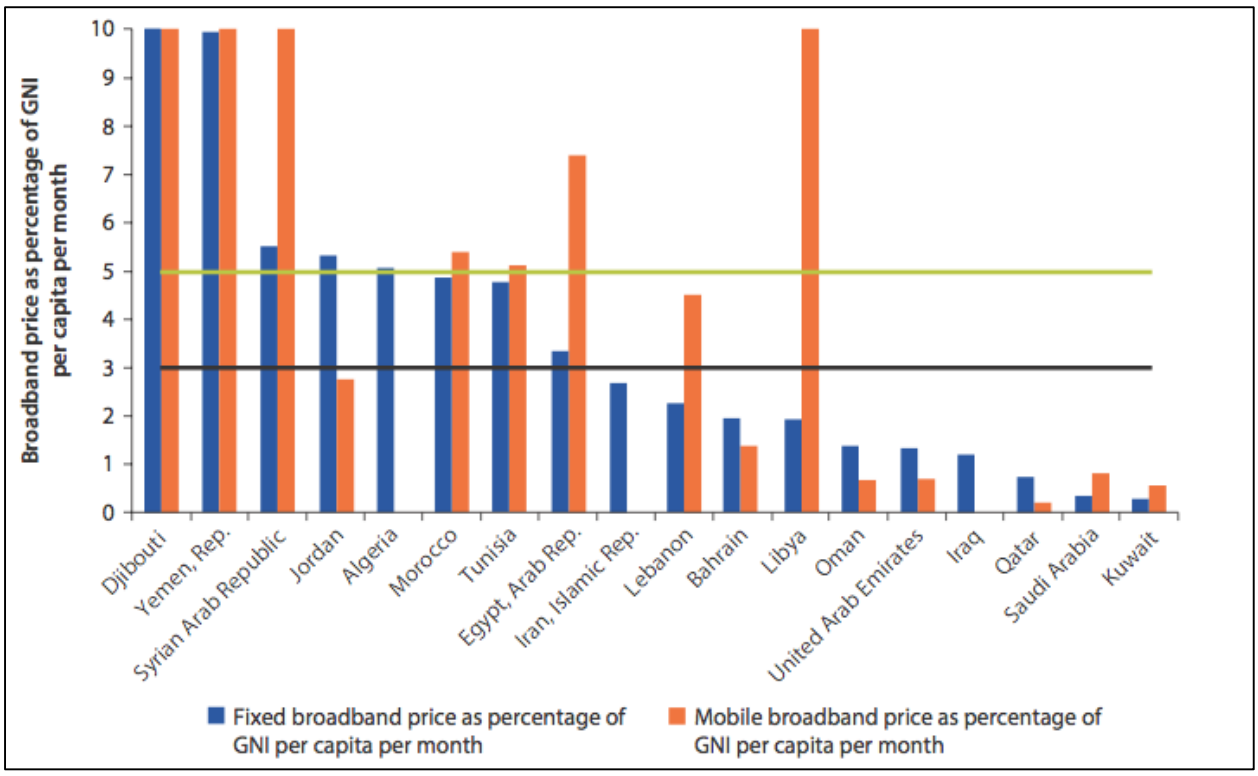


Figure 5.12 the fixed and mobile Broadband cost in MENA. (ITU, 2013)

Particularly in countries in the emerging phase, it could observed that in most cases there is a lack of competitive market conditions. For instance, in the case of Djibouti the high cost of mobile broadband is consistent with the low penetration of third generation of mobile telecommunications technology (3G) in the country, that is, 2.22% per 100 inhabitants. In Syria, the Republic of Yemen, and Tunisia, low 3G penetration (4.33%, 1.82% and 5.10% per 100 inhabitants, respectively) is consistent with the high cost of mobile broadband as a percentage of average income (Weber, 2010).

This is related to the lack of strategies and the planning policies and if it is available it is not updated regularly in the table of the World Bank in 2014. (See Table 5.10)

Table 5.10: National Broadband policies within MENA, (World Bank, 2014)

Region	Economy	Broadband policy	Link
North Africa	Algeria	Yes/2008 New version planned	Not available
	Tunisia	Yes/2012	Tunisia Broadband Strategy 2012: http://www.itu.int/ITU-D/arb/ARO/2012/RDF/.../Doc6-BroadBand.pptx%E2%80%8E
	Libya	No/Planned	Not available
	Egypt, Arab Rep.	Yes/2011	eMisr National Broadband Plan: http://www.tra.gov.eg/emisr/Summary_En.pdf
	Morocco	Yes/2012	Digital Morocco 2013: http://www.egov.ma/SiteCollectionDocuments/Morocco Digital.pdf%E2%80%8E
Mashreq	Lebanon	Yes/2008	National E-Government Framework: http://www.undp.org.lb/programme/governance/ict4dev/eStrategy.cfm
	West Bank and Gaza	Yes/2011	National ICT Strategy 2011–2013: http://www.pmtit.ps/ar/cp/plugins/spaw/uploads/files/Trans_National_Strategy_ICT-Post_Palestine2011-2013.pdf
	Iran, Islamic Rep.	Yes/N/A	National ICT Plan: http://www.scict.ir/portal/File/ShowFile.aspx?ID=f179cbbc-a580-4285-8105-9ca0e60599e1
	Iraq	No/2013	Not available
	Jordan	Yes/2013	National ICT Strategy 2013–2017: http://www.moict.gov.jo/Portals/0/PDF/NewFolder/ADS/Tender2/Final%20Draft%20Jordan%20NIS%20June%202013.pdf
	Syrian Arab Republic	Yes/2004	National ICT Strategy 2004: http://www.arab-hdr.org/publications/other/undp/hdr/2004/syria-ict-04e-strategy.pdf
Gulf	Bahrain	Yes/2012	E-Government Strategy 2012–2016: http://www.ega.gov.bh/wps/wcm/connect/1f75f0004af9c3b2b84cb978e38c6a11/eGov%2BStrategy_Brochure_Eng.pdf?MOD=AJPERES
	Kuwait	Yes/2004	Not available
	Oman	Yes/2012	E-Oman Strategy 2010: http://www.unescap.org/idd/events/2010_ESCAP_DESA_Roundtable_ITC/6-OMAN.pdf
	Qatar	Yes/2011	ICT Strategy 2015: http://qnbn.qa/about-us/ict-strategy-2015/
	Saudi Arabia	Yes/2010	E-Government Action Plan 2012–2016: https://www.yesser.gov.sa/en/MechanismsandRegulations/strategy/Documents/the_2nd_egovernment_action_plan_ENG.pdf

The MENA region shows a relatively different technology mix for fixed broadband at the sub- regional level (see figure 5.13). North African countries mainly offer wire-line connections, using traditional copper lines of the telephone network equipped with xDSL technology about 96% of total, with some limited trials of fiber-to-the-x (FTTx/LAN) just about 1% of total. Wireless connections using WiMax are negligible.

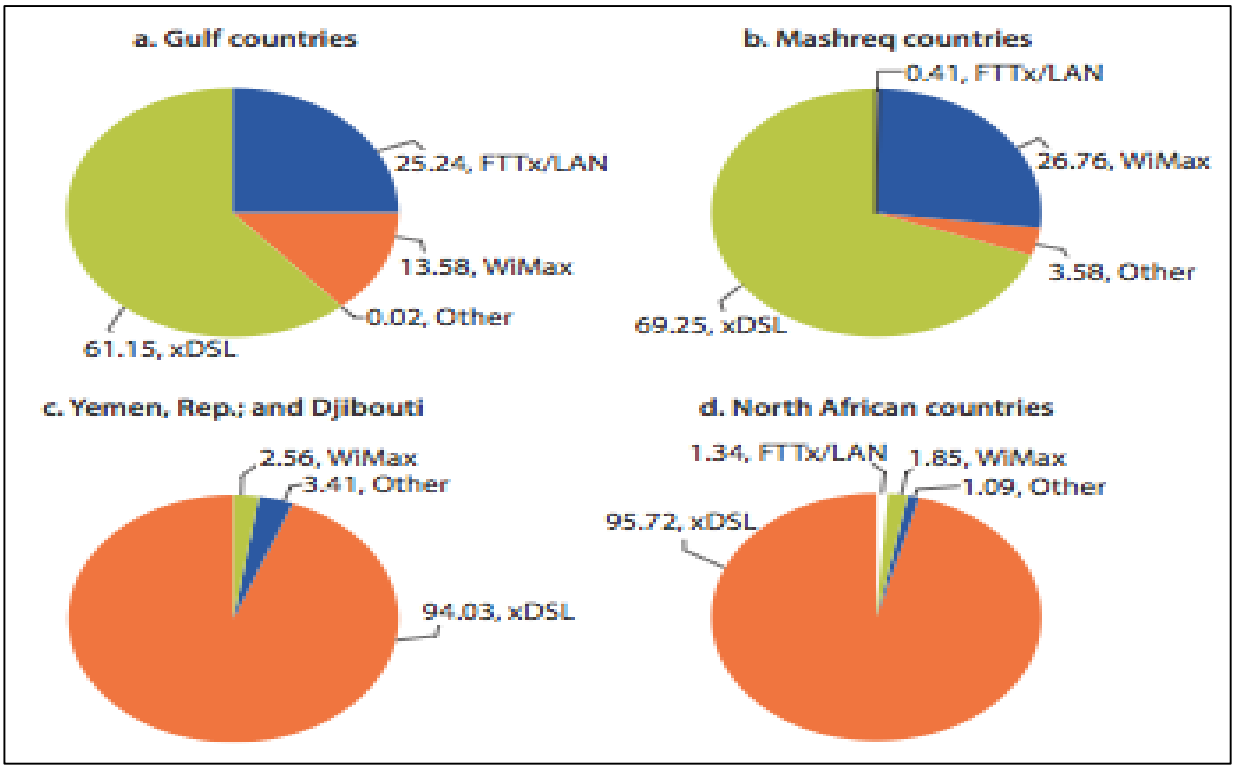


Figure 5.13: Distribution of Fixed Broadband connections per technology in four MENA sub-regions, (TeleGeography's Global, 2013)

5.6 The barriers of E-learning implementation in UK (As international culture)

The report produced by UK trade and investment (UKTI) in 2013 mentions that *"the UK has one of the strongest ICT infrastructures in the world, with privatization of the major ICT service providers having led to greater competition and lower prices* "

More than 48% of all households in the UK have a PC; more than 82 % of all British people have a mobile telephone; about 43% of all British adults use the internet, and the UK has one of the largest numbers of bank clients using the internet for their normal banking services (World Bank, 2012). The main reason for these achievements is the huge investment made by the government and IT companies into the UK infrastructure, which, in 2006, exceeded £170 million for the development of e-government alone (BCPRA, 2003).

The researcher has chosen the University of Huddersfield as sample from the UK's universities to explain the barriers for lecturers to use technology in teaching. Jensen & Folley (2011) published the results of a study about teaching with technology in HE, which explored how lecturers use technology in teaching at the University of Huddersfield. The results of this survey may be considered as a sample of lectures' views in UK Universities. The survey asked about the thoughts and opinions of 86 respondents (56% women, 44% men; 83% senior lecturers, 7% lecturers and 10 % part-time staff) related to this issue. The main conclusions of this report are described below.

- The key barriers to e-learning in the UK lie in cooperation on cultural and technical issues. From the

cultural perspective, it has been shown that many people in the UK think that e-learning is removing the traditional face-to-face communication between lecturer and student so it is more difficult to relate to each other without body language.

- It was found that the primary barrier was the time available to learn to use technology and then to redesign teaching delivery. Many publications have underlined the lack of time as one of the barriers to using and implementing technologies in HE (see figure 5.14). However, the lack of time was often a catch-all excuse to avoid dealing with lack of engagement, since its strength was due to prioritisation of activities. It is a response that would benefit from being unpacked and explored further.

Also, it is worth considering that many uses of technology can save you time in the long run, e.g. things such as electronic marking or use of peer-assessment by the technology's help.

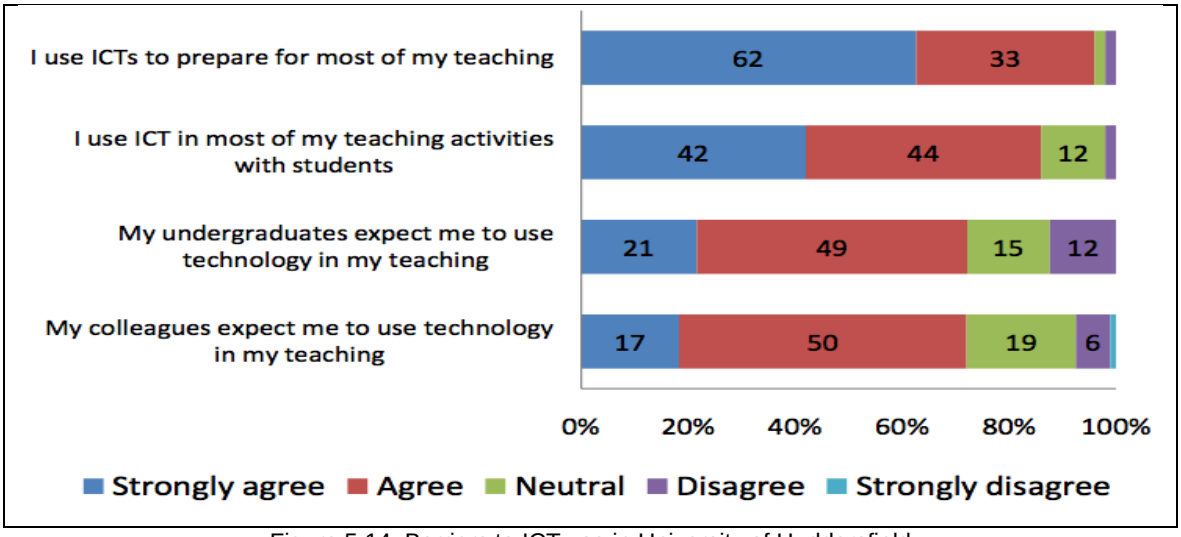


Figure 5.14: Barriers to ICT use in University of Huddersfield

Improvements in efficiency that could be achieved using technologies need to be highlighted to staff in the future.

British Educational Communications and Technology Agency (Becta) in 2004 published report about the on barriers to the uptake of ICT by teachers in the HEIs in Britain.

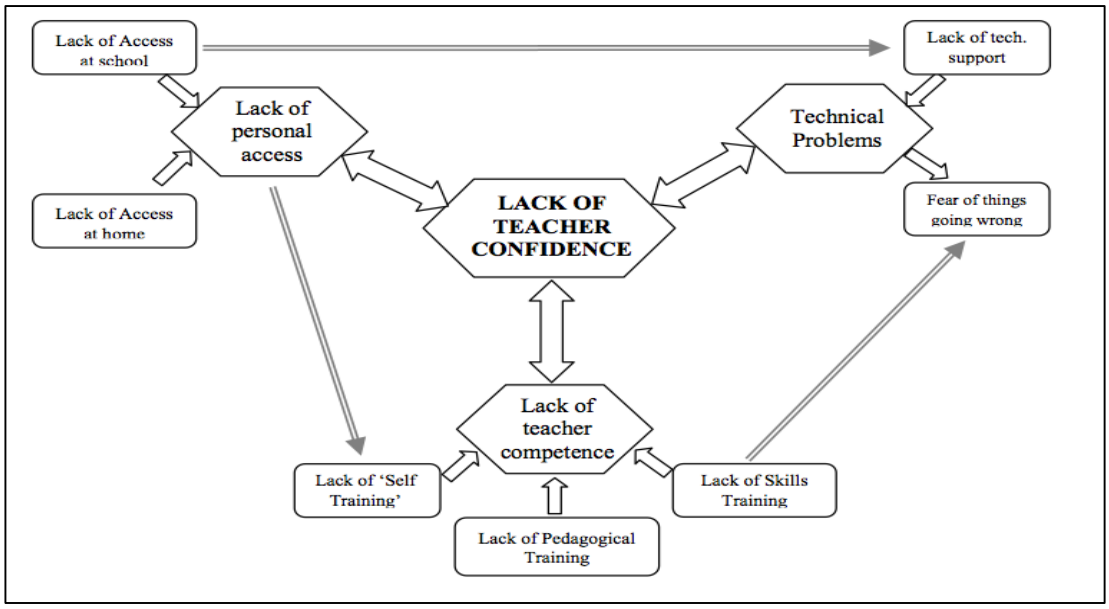


Figure 5.15: The relationships between the confidence barrier and the others. (Becta, 2004)

Figure 5.15 gives these barriers and the relationship between the main or core barrier that the lack of teacher's confidence and the others barriers that considered it as internal and external barriers.
The directions of arrows represents the phrase 'can lead to'. For example, a lack of technical support can lead to technical problems, which can in turn lead to a lack of teacher confidence. The double-headed arrows show that confidence can be affected by the three related barriers, but in turn, a lack of confidence could itself magnify the effects of these three barriers. For example, teachers with low confidence may have a higher expectation of technical faults occurring if they were to use ICT, and as a result may avoid using it. Furthermore, a teacher with low ACT confidence may choose not to take part in any optional training, perhaps through fear of embarrassment in front of colleagues, and as a result their competence in using ICT will not improve. Also, a teacher with low confidence may avoid seeking out facilities for personal access to ICT, which would as a result magnify the effects of this barrier.

In addition, some of the factors relating to these barriers can be interrelated, and indicated by the darker arrows on the diagram. For example, a relationship exists between the lack of technical support and teachers' personal access to ICT. Even when hardware is available, if technical support is not immediately to hand, any technical problems will reduce that access until the problems are fixed. Another relationship represented by the diagram is where the fear of things going wrong could be magnified by teachers' lack of skills training. With a lack of skills training teachers may experience a greater degree of anxiety about possible technical problems, as they would have less of an understanding of how to avoid or solve such problems independently (Becta, 2004).

In other research study about the barriers of e-learning without determine the level of education, it be founded in a study by title "The digital divide in a world city" to address the digital divide in London; the barriers to e-learning adoption and use can be categorised into socio-personal factors and socio-economic

factors. Socio-personal factors include attitudinal and behavioural issues such as levels of awareness, interest, knowledge and acceptance of ICTs by individuals (Foley, et al., 2002).
The results of these studies could be considered to represent the general view of lecturers from UK universities regarding the advantages and challenges related to technology enhanced learning.

Another factor is the requirement of lecturers to use new tools in order to gain more knowledge from training courses and online materials. However, they do not have enough time allocated for these tasks (Andersson, 2008). Some also argue that the lack of a fast internet connection is a key barrier to e-learning, which can be categorised as another of the technological challenges to e-learning (Alexander, 2006). Rosenberg strongly supports the view that technology itself is creating barriers to e-learning (Rosenberg, 2001).

There are similarities between attitudes in the two countries (Libya and the UK) in terms of analysis of the impact of e-learning and ICT in HEIs; however, there are also clear differences between the UK and Libya, which are influenced by existing interaction with e-learning and ICT in HEIs. It was found that the challenges or barriers to e-learning in Libya could be classified into three different categories: technological barriers, cultural barriers and other barriers related to management attitudes. (Kenan et al., 2015)

A. Technological barriers: the lack of provision of robust internet access and difficulty of coping with the changes in technology are major issues (Rosenberg, 2000)

B. Cultural barriers: the key barriers to e-learning in Libya includes the role of government policy, which does not promote e-learning and even refuses to recognise qualifications obtained by e-learning. That culture has influenced students in Libya to stick to courses offered by traditional teaching methods. However, in the UK, the key barriers to nationwide e-learning are the lack of provision of a nationwide high speed connection (broadband), which would allow e-learning to reach everyone in the country. In this sense, the UK government has failed in its role as provider of a strategy that links the different stages of education, when the existence of such a strategy would allow students to accept the changes that occur in HE when it comes to the use of e-learning (Pow, 2006).

C. Other issues: the pedagogy issue involves finding new techniques to deliver learning content and there is a missing link in the general strategy of education between different stages of study; this therefore leads to difficulty in accepting e-learning in HEIs.

E-learning in HE in the UK is experiencing exceptional growth and development in usage. Despite the challenges which are faced by HEIs, e-learning has successfully managed to bring education to all those who request it. The need to create a more encouraging environment for learners has proved to be a condition for the attainment of excellent results.

Libya faces more barriers to the development and growth of e-learning than does the UK. On the other hand, both the UK and Libya face a common difficulty: they lack the provision of strong training and widely available internet connection technologies. Libya has demonstrated resistance to change and faces the

disadvantage of lack of experience in use of the internet amongst many of its students. Therefore, the Libyan ICT policy must consider the UK's attempts at using ICT in teaching, and evaluate how e-learning impacts on education.

If e-learning can be established in Libya, most of the problems resulting from a shortage of places at traditional educational institutions will be solved, since it would enable them to enroll the increasing number of students who want to study at university, whilst providing them with a chance to learn. Additionally, it would also promote scientific cooperation and facilitate access to research for every student. As more explain next table will demonstrate as comparative Libya with the others.

Table 5.11: Comparison of the barriers for e-learning implementation in Libya, Arabic countries and UK

Barriers	Libya	Arabic countries	United Kingdom
Techn-ological	Lack of internet access. Reduced quality of broadband. Limited access to technical support.	Lack of internet access. Lack of IT security Limited availability of resources	Reduced speed of internet connection. Availability of renew the resources
Cultural	Staff is afraid to use modern technology due to lack of IT skills and training opportunities. People do not focus so much on education because of the war. Lack of Government strategy to support the e-learning implementation.	Teachers are afraid of losing their jobs due to online courses. Lack of IT training. Students prefer to use the technology for socialising more than educational purposes.	Lack of available time to use the technology for pedagogical purposes. Short time span for changes of policies and strategies.
Pedago-gical	Increased number of teaching hours. Preference for traditional teaching method. Lack of data protection for academic research. Lack of online resources in the libraries for Universities.	Lack of online resources in the libraries for Universities. Lack of versions in Arabic language for online resources. Limited access to internet so the students do not have the chance to use the technology for socialising.	Requirements to implement rapid changes in the use of technology for educational purposes. Requirement for the variety of teaching methods and resources

The researcher of this thesis has published a conference paper in Florida in 2011, by title *"comparing the impact of e-learning and ICT in higher education institutions in Libya and United Kingdom"* which was as reference in this part.

5.7 Evaluation of the ICT gap in Libya

As shown in the last section, the digital gap in Libya and MENA regions with higher broadband diffusion is mainly a gap in market structure, competition, and governance. Several indicators show the spread of ICT applications in education: number of computers per hundred students, number of hours of study in the field of ICT, number of schools that use the internet, speed of the internet connection, specialist television and radio broadcasts. They can be used on a global scale to determine whether there is a "digital divide" between countries.

Hamdy in 2007 concludes that because the technical and technological level existing in a country largely determines the rate at which information technology develops, the developing countries will not catch up

easily. In fact, he is concerned that developing countries may miss out on the opportunities offered by the information and communication revolution because of an inability to fully participate in all spheres of political, economic, cultural, scientific life provided by the IT revolution of new technology. (Hamdy, 2007)

Al-badree (2007), El-hawat (2005) and Elzawi (2008) conducted studies related to the web usage in the Middle East and around the world. During the year 2007 on a world scale Africa had 3.6% of internet users, the Middle East, 10%, Asia 11%, Europe 39.4% and North America 67%. This shows that there is a substantial digital gap, which will require some efforts to be overcome (Tzeng et al., 2007).

Craig Barrett Chairman on Intel wrote an article about "Bridging Africa's digital divide" in 2011. He points out that '*computers are not magic, teachers are magic. If you train teachers effectively in how to use the technology and how to use it in the classroom to make it more interesting more exciting, to teach young people how to solve problems'*.

Douglas, write about the ICT gab in Libya in 2014 article by title: "Libya Leads the World in Slowest Internet Connection Speeds." (Douglas, 2014). One challenge is a lack of submarine cables, since there's no overarching strategy to have a fibre network throughout Africa. It is more a regional or country-by-country issue and has been relatively slow process, but the advantages are immense: better education, better health care, and economic development.

The creation and strengthening of open markets for broadband infrastructure, networks, services, and digital content is a top priority. Countries that followed this path, for example, in Eastern Europe and Asia, were able to quickly leapfrog more advanced countries, bypassing obsolete legacy infrastructure. A commitment to open markets means enforcing a deep regulatory reform, introducing measures to strengthen competition, eliminating monopolies, licensing more operators, tackling dominant positions, and lowering explicit and regulatory barriers to entry. This kind of improvement continuously involves addressing local resistance to change, often coming from those economic and political agents that are profiting from existing rents.

5.8 Chapter summary

This chapter describes the educational structure in Libya with the ICT infrastructure and the results of the analysis for the barriers related to the successful e-learning implementation in Engineering School at Tripoli University in Libya. Also, this chapter contains the comparison of the barriers related to the successful e-learning implementation in Libya, other Arabic countries and United Kingdom considering the differences in social, economical, political, cultural, educational conditions from these countries.

These barriers related to successful e-learning implementation in Libya are determined through quantitative analysis in Section 3, from the questionnaires completed by teachers, technicians and students (HE stakeholders) (see Chapter 4). There are three types of barriers: technical, cultural and mismanagement. This chapter presents the analysis of the perception of HE stakeholders about several aspects related to these barriers.

These barriers are considered as weaknesses and threats that is for the SWOT analysis which will be presented in the next chapter, SWOT model for the diagnostic of the current stage of e-learning performance in the Engineering School at Tripoli University.

Chapter 6: SWOT model for the diagnostic of the current stage of e-learning performance in the Engineering School at Tripoli University

SWOT is an acronym for Strengths, Weaknesses, Opportunities and Threats. The 'Strengths' and 'Weakness' are vital, real and are internal factors; while the 'opportunities' and 'threats' should both focus on possible future of analysed situation and external factors (Kenan, et al., 2014). The strengths and the opportunities are the positive points in the analysis and the weaknesses, threats are the negative points.

"The people who use SWOT might conclude that they have done an adequate job of planning and ignore such sensible things as defining the firm's objectives for alternate strategies" (Scott, 1982). Thus, it is important to consider various solutions after examining the results of SWOT analysis.

The SWOT method can be used during the design, development and implementation stages of any project. It is also a convenient tool for the evaluation stage in order to have an initial idea of possible future consequences (Jones et al., 2012). Therefore, SWOT analysis is an essential step to analyse various factors before implementing an e-learning solution at any institution; because the success or failure of an e-learning initiative will be directly related to the quality of strategic thinking that underpins it (Kohn et al., 2010). It is thus important to have an e-learning strategy in place before beginning the implementation process. (Kenan et al., 2013C). This chapter presents the development of a SWOT model based on the personal experience of the researcher who has studied at Tripoli University, and then became Lecturer at the same university. Also the barriers to e-learning implementation (which have been analysed in Chapter 5) will be included in the SWOT model.

Figure 6.1 presents the main categories of the SWOT technique, or framework, which can be used for planning and management purposes of existing systems or to create ideas for future actions for systems under development. Scott (1982) mentioned the advantages of SWOT technique provide a realistic view regarding the strengths and weaknesses and the differences between the actual plan and future developments; enable the analysis of existing competition environment; it is a short and simple analysis method which should be used as a guide and not a prescription.
The SWOT model has been used by other authors in order to implement and evaluate the e-learning performance in Libyan HEIs. Artemi and Ajit (2009) has performed a SWOT analysis of an e-learning model for Libyan HEIs and recommended that the institutions should start working hard on minimizing the weaknesses (such as poor English skills of students, as well as instructors, lacking ICT infrastructure, and lack of e-learning know-how). He emphasized that the e-learning initiative must be included in the institution's core business with clear objectives.

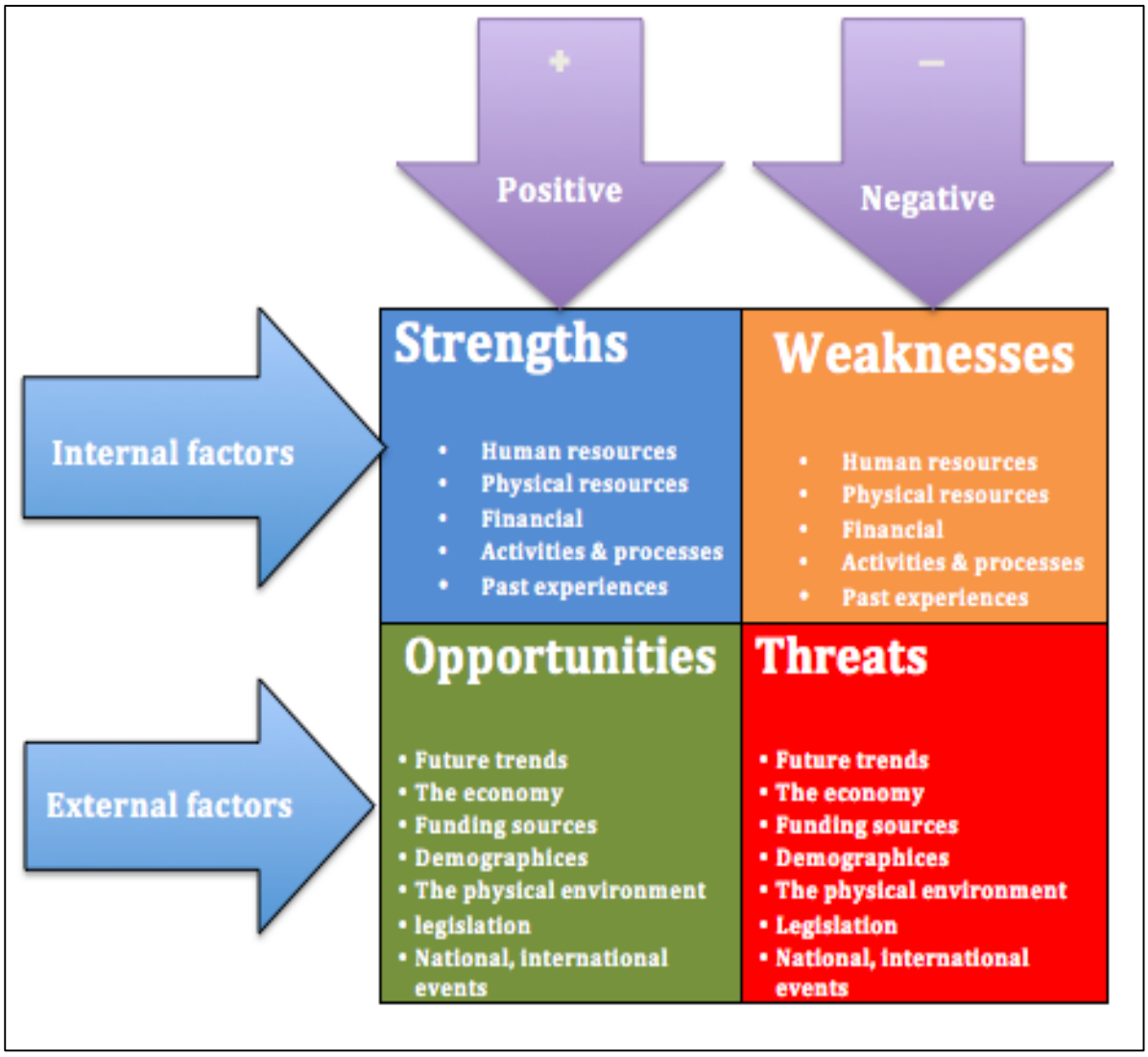


Figure 6.1: SWOT model

Rhema and Miliszewska (2012) indicated that SWOT analysis is an essential step to analyse the various factors before implementing an e-learning solution at any HE institution in Libya. The SWOT analysis has shown the perspectives of the lecturers, students, administrators, and technical staff towards using web-based instruction. The identified strength and weaknesses of SWOT analysis could assist decision makers when developing and implementing the e-learning strategy for their institutions.

In this thesis the Strength points have been measuring through the following questions in the three separate questionnaires for the Lecturers, Technicians and students.

6.1 SWOT analysis based on Lecturers' answers

This type of analysis start with offering the Strength points (see Figure 6.2) resulted from the analysis of the lecturers' answers to the following questions (See Appendix A1, A2 & A3).

Quadrant A – shows the distribution of lecturers' answers to question **Q7: How many hours do you spend using the Internet per day?** All lecturers have been using computers and the internet for teaching, research databases, social networking shopping etc., as shown in figure 6.2/A. The highest percentage of lecturers have been accessing the internet between 2 and 5 hours/day and the next category used the internet between 6 to 9 hours /day. These results can be considered as Strength points, because they show that lecturers spend a reasonable amount of time using the internet, even though the access speed is low and there is an ICT gap due to war conditions in Libya. The resulting Median was (1.44), indicating that the average hours for using the internet by the lecturers was ranging between 2-5 hours, which seemed to be suitable because the lecturers can spend the remaining time on other teaching activities.

Quadrant B – shows the distribution of lecturers' answers to question **Q8: Do you think that the use of online resources or ICT have added value to your lectures?** The highest percentage of lecturers strongly agreed, showing their awareness about the positive influence of the online resources and ICT on the quality of their lectures. Their answers demonstrate that *"the curriculum is becoming more dynamic and interactive as a result of the many kinds of ICT based learning activities, projects and software applications being developed*" (UNESCO, 2005A).

Quadrant C – shows the distribution of lecturers' answers to question **Q9: How many hours do you spend using technology for teaching and learning per day?** The highest percentage of lecturers access the internet between 2 and 5 hours/day and the next category used the internet less than 2 hours for teaching and learning purposes. These results can be considered as Strength points because demonstrate that lecturers prefer to use technology to improve the quality of the course materials, even though there is a reduced number of training courses on ICT topics. It was encouraging to see that the lecturers are keen on overcoming the technological and cultural barriers related to e-learning implementation. They were prepared to adopt more technology enhanced teaching methods, even though in the past the Libyan people were subjected only to the traditional teacher-led approach.

Quadrant D – shows the distribution of lecturers' answers to question **Q11: Which of the following do you consider as the most important element to achieve a successful E-learning implementation in Libyan Higher Education Institutions?** The highest percentage of lecturers identified the development of ICT and Blackboard intranet as the most important elements for successful e-learning implementation.

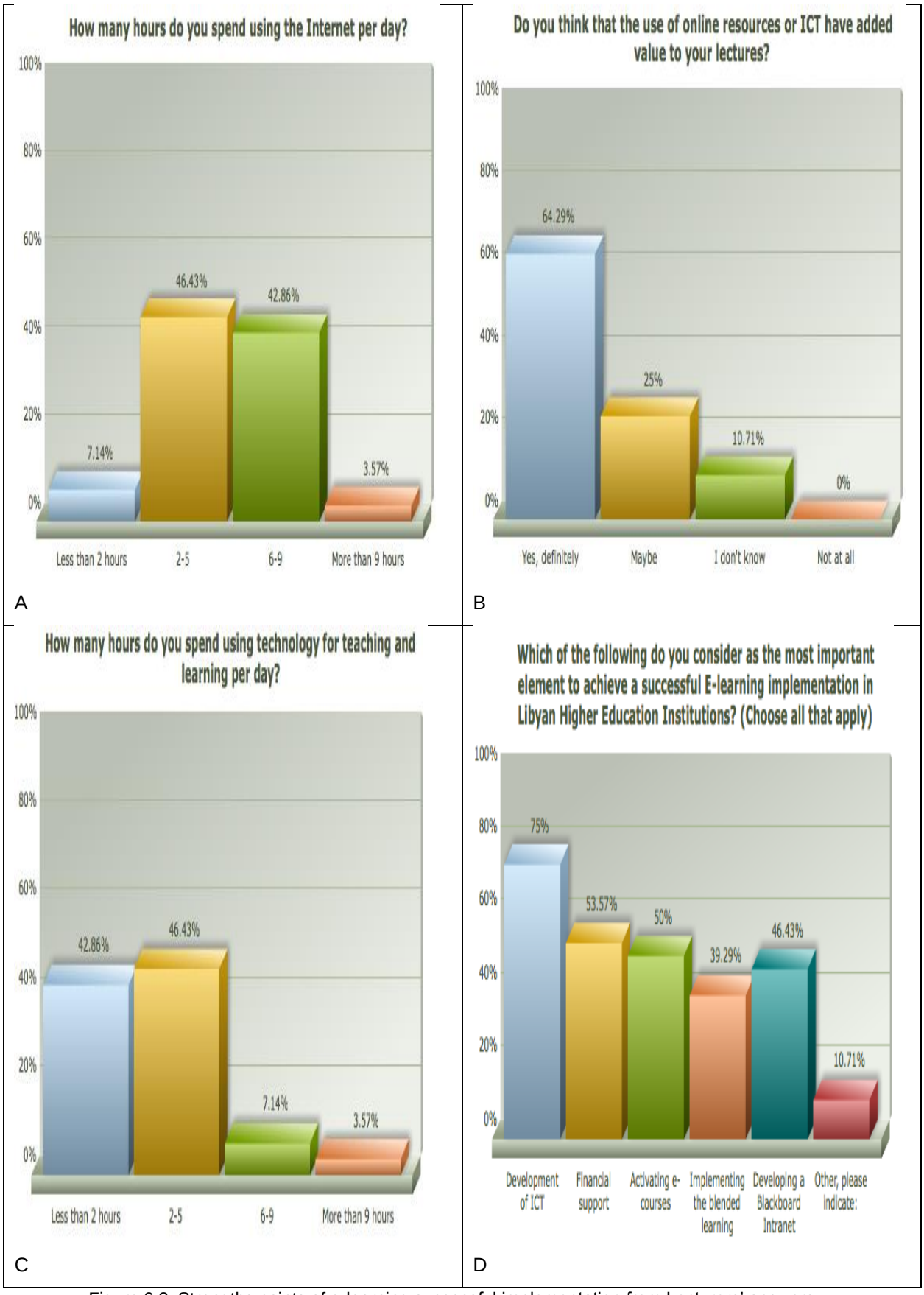


Figure 6.2: Strengths points of e-learning successful implementation from Lecturers' answers

This multiple choice question had other options, where the lecturers could include their own comments. One lecturer has written that "*The success or failure of an e-learning operation depends on the structure of organisation that is expanded by an institution's leaders, to prepare for the adaptation of e-learning, in order to improve teaching and learning methods. It is also necessary to investigate HEI organisational structures, which enable the adoption of e-learning."* Another lecturer added that "it is necessary to train the teachers how to use e-learning in their lectures"

The average total number of monitored elements was 2.47 per lecturer, indicating that from five factors, two elements were important, irrespective of these elements. It is likely for age and experience to have a relationship with the total of elements chosen by the lecturers. Using simple correlation, Table 6 shows there is low positive correlation, which was significant (corr=0.315, p-value=0.045), with experience of lecturers, indicating that as the experience increase, more elements will be chosen. The same type of correlation was found with age, but it was not significant (corr=0.205, p-value=0.199, and there was no relationship between age the elements of achieving successful e-learning.

The Opportunities have been shown in Figure 6.3 and resulted from the analysis of the lecturers' answers to question Q10 (See Appendix A1, A2 & A3).

Question Q10 was: Please give your opinion about the following statements by ticking the appropriate box.

The first item was - **E-learning implementation will increase the efficiency of teaching**. The proportion of lecturers who both 'strongly agreed' and 'agreed' was 51.2% and 43.9%, respectively which was 95.1% of the total sample. The resulting median of degree of approval reached 0.51, which was in the range of strong agreement effect. These answers showed that the lecturers recognised the influence of e-learning implementation on the quality of teaching processes.

The second item was - **I support the implementation of e-learning in all HEIs in Libya.** The proportion of lecturers who both 'strongly agreed' and 'agreed' was 29.3% and 56.1%, respectively which was 85.4% of the total sample. The resulting median of degree of approval reached (0.83) which was in the range of agreement effect. The lecturers expressed their support of the implementation of e-learning systems in all HEIs in Libya so they would like to see a national strategy with definite tasks and milestones.

The third item was - **E-learning method is more flexible than the traditional methods.** The proportion of lecturers who both 'strongly agreed' and 'agreed' was 36.6% and 39%, respectively which was 75.6% of the total sample. The resulting median of degree of approval reached (0.84) which was in the range of agreement effect. The lecturers recognised that the e-learning method offers more flexibility in comparison with the traditional one and they could choose some advantages in the other options for this question.

The fourth item was - **Blended learning should be adopted by all Libyan HEIs.** The proportion of

lecturers who both ‘strongly agreed’ and ‘agreed’ was 31.7% and 53.7%, respectively which was 85.4% of the total sample. The resulting median of degree of approval reached (0.80) which was in the range of agreement effect. A high percentage of lecturers opted for blended learning because they consider this approach to enable a smooth transition between the traditional method of teaching and delivery of online courses.

The fifth item was - **E-learning should play an important role in curriculum development**. The proportion of lecturers who both ‘strongly agreed’ and ‘agreed’ was 24.4% and 51.2%, respectively which was 75.6% of the total sample. The resulting median of degree of approval reached (1.00) which was in the range of agreement effect. The lecturers emphasised the necessity of including the use of e-learning packages in the development of new courses.

The sixth item was - **E-learning can contribute in solving some educational problems (such as increasing the number of students, access to distance learning materials by disabled people, house wives, learners in remote places like desert areas, etc**. The proportion of lecturers who both ‘strongly agreed’ and ‘agreed’ was 26.8% and 48.8%, respectively which was 75.6% of the total sample. The resulting median of degree of approval reached (0.97) which was in the range of agreement effect. The lecturers have identified the advantage of using e-learning systems for solving some problems related to the aspects of inclusive education in Libya such as access, widening participation, equity, equality and diversity, lifelong learning, etc.

The seventh item was - **E-learning increases the students’ motivation for learning.** The proportion of lecturers who both ‘strongly agreed’ and ‘agreed’ was 31.7% and 61%, respectively which was 85.4% of the total sample. The resulting median of degree of approval reached (0.93) which was in the range of agreement effect. This confirmed the conclusion made by Rhema et al (2013) that the e-learning is increasing the level of students’ satisfaction.

The eighth item was - **E-learning contributes to the acquisition of IT skills**. The proportion of lecturers who both ‘strongly agreed’ and ‘agreed’ was 29.3% and 65.9%, respectively which was 95.2% of the total sample. The resulting median of degree of approval reached (0.74) which was in the range of agreement effect. The lecturers recognised that the design, development and implementation of the e-learning packages enabled them to acquire new IT skills because they had to use animation, simulation and other means to express scientific concepts.

The ninth item was - **E-learning assists the students to better manage their time.** The proportion of lecturers who both ‘strongly agreed’ and ‘agreed’ was 19.5% and 53.7%, respectively which was 73.6% of the total sample. The resulting median of degree of approval reached (1.10) which was in the range of agreement effect. The students could learn at their own pace and access the materials at any time and place, so the travel time was saved and they could perform other tasks during this saved time.

The tenth item was - **E-learning encourages the students to learn other languages.** The proportion of lecturers who both ‘strongly agreed’ and ‘agreed’ was 24.4% and 41.5%, respectively which was 65.9% of the total sample. The resulting median of degree of approval reached (0.89) which was in the range of agreement effect. The majority of the materials for e-learning packages are written in English and other foreign languages so the students have to study these languages and use dictionaries to understand specific words. Overall, the aforementioned statements concerned with advantages of e-learning were considered as positive factors of enhancing the students’ thinking skills.

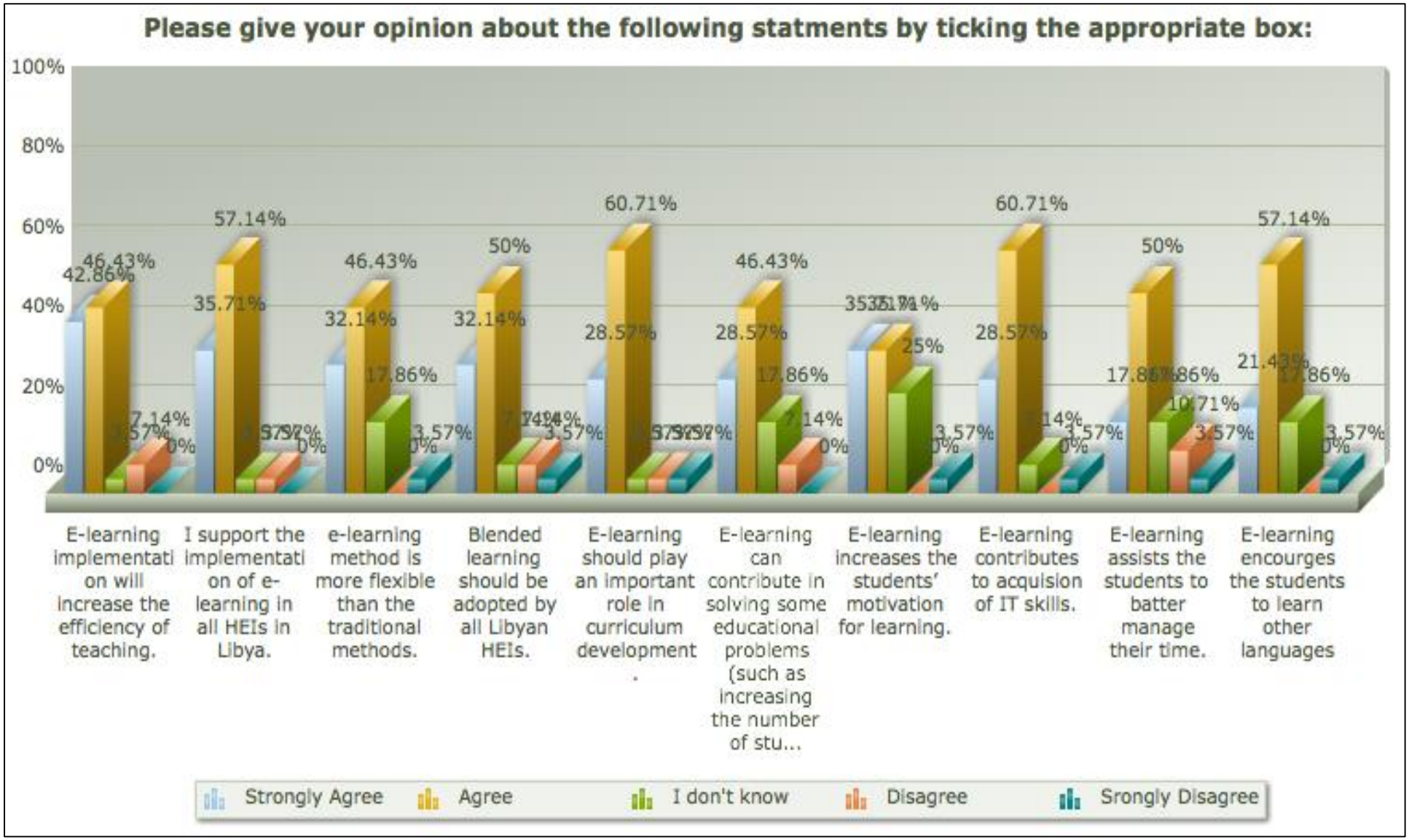


Figure 6.3: Opportunity points of e-learning successful implementation from Lecturers' answers

The weaknesses and threats were considered from the distribution of lecturers' answers to question **Q20 - What incentives or rewards have you received from your Institution?** See this table.

Table 6.1: Incentives/rewards received by Lecturers

	No		Yes		Rank
	Number	Frequency	Number	Frequency	
Laptop or computer when you started	37	90.2	4	9.8	5
Training courses	33	80.5	8	19.5	3
Financial rewards	36	87.8	5	12.2	4
Payment for annual conference attendance	36	87.8	5	12.2	4
Subscription to specialised journals	41	100.0	0	0.0	1
Publishing your publications (books, journal papers	40	97.6	1	2.4	6
None at all	12	29.3	29	70.7	2

It is obvious that there is lack of support for the academic staff from the University:

- more than 90% of the lecturers have not received computer or laptop when they started working in the School of Engineering at Tripoli University even though the lecturers have recognised the importance and usefulness of computers for the teaching and learning activities (see the 'Opportunities' section);
- not all lecturers received any financial support for the subscription for specialised journals, even though it is necessary to perform continuous research in the specific field so they can be up to date with the latest developments.
- more than 87 % of lecturers did not receive any support to attend conferences, so it was difficult for them to publish papers, network with other people at conferences and receive feedback for their research results.

Also other weaknesses and threats were derived from the barriers analysed in Chapter 5 and have been included in Table 6.2.

Table 6.2: SWOT model for Lecturers

Strengths	**Weakness**
Using the Internet Using online resources or ICT tools Using technology for teaching and learning. Awareness of the positive influence of e-learning and online resources on the quality of teaching and learning activities.	Lack of provision for Internet access. Cultural barriers for a society as tradition-bound as Libya's. Lack of general educational strategy which includes the pedagogical and technological issues related to the use of technology-based teaching. Heavy teaching workload for lecturers.
Opportunities	**Threats**
Increasing the efficiency of teaching Acquisition of IT skills Support of blended learning Increase the variety of learning methods	Lack of training attendance courses Lack of satisfaction with the Internet speed in campus The culture of high resistance to change Lack of resources used in the classroom Lack of motivation and incentives

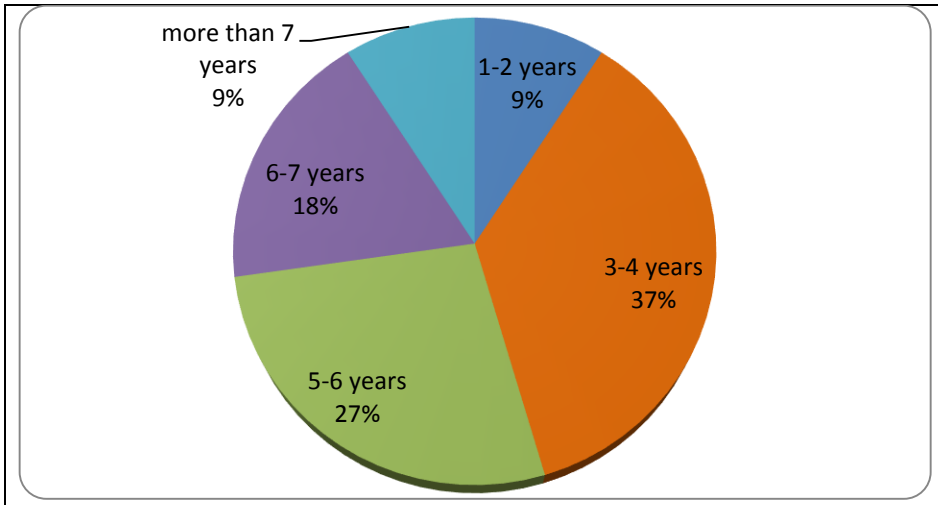
6.2 SWOT analysis based on Technicians' answers

The Strength points (see Figure 6.4) resulted from the analysis of the lecturers' answers to the following questions (See Appendix C1, C2 & C3).

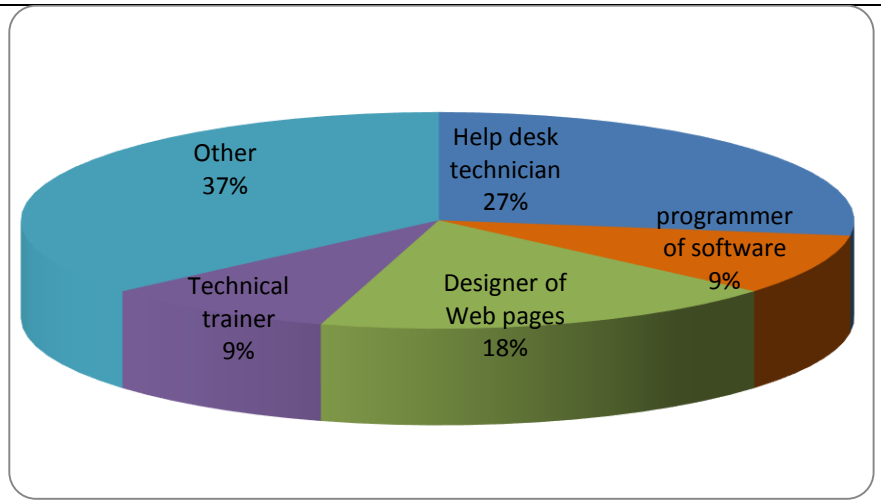
Quadrant A – shows the distribution of technicians' answers to question **Q6: How long have you been working in this job?** The majority of the respondents (36.4%) had a working experience of 3-4 years while 18.2% had working experience of 5-6 years. This showed that the technicians loved their jobs and were able to make a very useful contribution to the practical aspects of teaching activities.

Quadrant B – shows the distribution of technicians' answers to question **Q5: What is your job role?** The highest percent of the respondents (37%) had different roles than those specified as options for this question so the technicians' team had a variety of expertise which enabled the delivery of effective and efficient technical support when necessary.

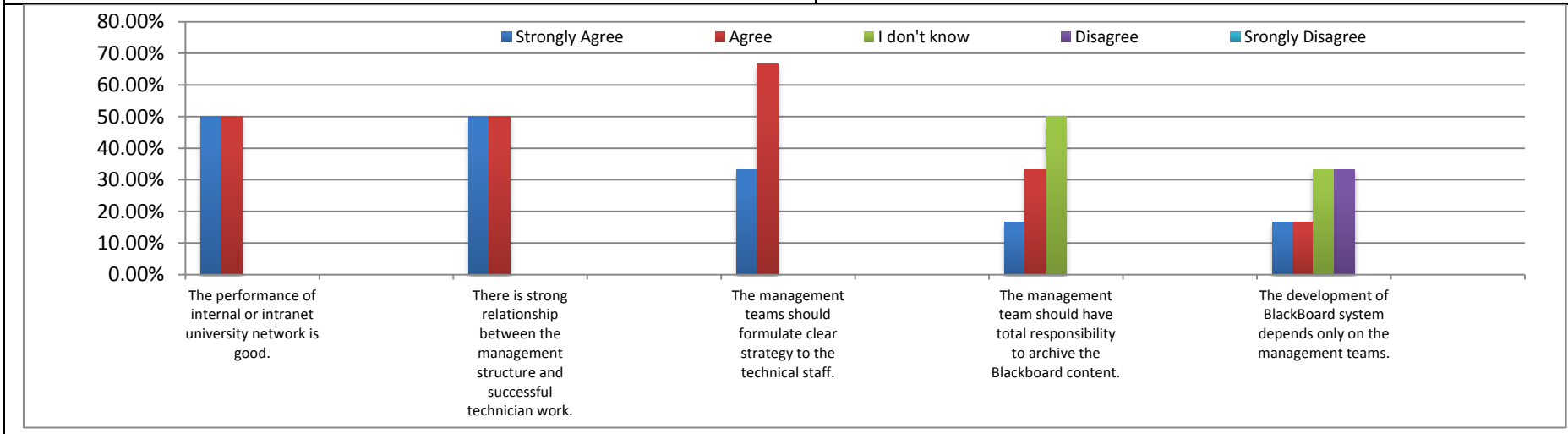
Quadrant C – shows the distribution of technicians' answers to question **Q11: What is your opinion about the link between the performance of ICT system and people who are in managerial positions?** There is a strong link between the management structure and successful technician work. The highest percent of the respondents (66.7%) agreed that the management team should formulate a clear strategy to the technical staff.



A. Distribution of experience



B. Distribution of job role for technicians



C. The performance of ICT system and people who are in managerial positions.

Figure 6.4: Strengths points for Technicians

The Opportunities have been shown from the results of section two in the questionnaire (3) of technicians (See Appendix C1, C2 and C3); Opportunities points came as results the respondents' answers on the following tables:

Table 6.3 – it was Q8: Do you work as a team when solving the technical problems? This part of analysis will discuss how they work as a team when solving the technical problems.

Table 6.3: The work as a team when solving the technical problems

The work as a team when solving the technical problems	Frequency	Percent
Always	2	16.6
Usually	3	25
Sometimes	4	33
Rarely	3	25
Not at all	0	0

The percentages of always, usually and sometimes are 16.6%, 25% and 33%; which is give opportunity to success the teamwork with suitable strategic plan.

Table 6.4 - it was Q12: Which of the following do you consider as the most important element to achieve a successful E-learning implementation in Libyan HEIs? The percentages of these elements could be opportunities points. Table 6.4 depicted five factors which are likely to provide useful information. After that, the elements in order, according to 72.7% the technicians, development of ICT was the most important. Then, financial support (54.5%) came second, however this percent was no high sufficient indicator that reflect the importance of finical support. The relative importance of the remaining elements were in developing a blackboard intranet, actives e-courses imposing the blended learning (36.4% for each element). The average of total number of monitored elements was 2.47 per technician indicating that from five factors, about, two elements were important irrespective of these elements. Therefore, if these elements gave real support, e-learning will be success.

Table 6.4: Most important element to achieve a successful e-learning implementation in LHEIs

	No		Yes		Rank
	Num.	Frequ.	Num.	Frequ.	
Development of ICT	3	27.3	8	72.7	1
Financial support	5	45.5	6	54.5	2
Active e-courses	7	63.6	4	36.4	3
Imposing the blended learning	7	63.6	4	36.4	3
Developing a Blackboard intranet	7	63.6	4	36.4	3
Other	12	100			4
Mean= 2.36					

Table 6.5 - it was Q13: What is your opinion about these factors which affect the performance of Blackboard system? The answers came as following:

Table 6.5: Factors affect the performance of Blackboard system

First factor is	(The quality of Blackboard implementation depends on the personal skills of the technicians). The proportion of technician who both 'agreed' was 45.5%. The proportion of technicians who both 'strongly disagreed' and 'disagreed' was 18.2% and 27.3%, respectively, which was 45.5% of the total sample. The resulting median of degree of approval, which was ranked forth, reached (2), was in the range of no agreement/disagreement with the effect of this factor.
Second factor is	(The technical training should be done by the ICT department). The proportion of technicians who both 'strongly agreed' and 'agreed' was 27.3% and 54.5%, respectively which was 81.8% of the total sample. The resulting median of degree of approval reached (0.89), which was ranked third, was in the range of agreement with the effect of this factor.
Third factor is	(Updating the Blackboard system needs to be done step by step). The proportion of technicians who both 'strongly agreed' and 'agreed' was 45.5% and 45.5%, respectively which was 90.9% of the total sample. The resulting median of degree of approval reached (0.63), which was ranked as the first, was in the range of strong agreement with the effect of this factor.
Forth factor is	(Tasks related to Blackboard System require the technical teams to work together). The proportion of technicians who both 'strongly agreed' and 'agreed' was 27.3% and 63.6%, respectively which was 80.9% of the total sample. The resulting median of degree of approval reached (0.80), which was ranked as the first, was in the range of agreement effect of this factor.

The weakness and threats of technicians came through the barriers view in last chapter, additionally to following point:

Table 6.6 - it was Q10: What are the needs of ICT Department when developing a Blackboard system? The answers came as following:

Table 6.6: Needs of ICT department when developing a Blackboard system

Requirements for the development of Blackboard system	No		Yes		Rank
	Num.	Frequ.	Num.	Frequ.	
Personal skills of technicians	8	72.7%	3	27.3%	4
Strategy plan from managers or the management team	3	27.3%	8	72.7%	1
Technical staff of work as a team	6	54.5%	5	45.5%	3
Totally renew Black Board system	5	45.5%	6	54.5%	2
Increase the speed of accessing Black Board	12	100%	-	-	

ICT's strategy can offer innovative IT systems to support the teaching services in of the LHEIs in general, and in the Engineering School of Tripoli University in particular. Through integrating the use of ICT into the curriculum to enhance teaching and learning. Table 6.9 depicts five factors, which are likely to provide information regarding the needs of ICT department when developing a Black Board system. According to 8 technicians (72.7%), the strategy plan from managers or the management team was the most important, and then the renewal of Blackboard system 5 technicians (54.5%), technical staff of work as a team (45.5%). Low attention was paid for Personal skills of technicians (27.3%). These results show a lack of management performance and lack of the quality assurance in the team.

Table 6.7 - it was Q9: Do you work with a systemic strategy plan? The options of answers came as following:

Table 6.7: Work with a systemic strategy plan

	Frequency	Percent
Weekly	2	18.2
Monthly	1	9.1
From time to time	7	54.5
Not at all	2	18.2

However, lack of working with a systemic strategy plan considers other weakness. Because, it is essential to build new strategy for LHEIs. However, from Table (6.7), it has been confirmed that there is not regular plan or systemic policy. About 7 technicians (54.5%) chose “from time to time”, and 2 technicians (18.2%) chose “did not had any plan”. Just 2 technicians (18.2%) declared that they had a weekly plan, whilst 9.1% of them had a monthly plan. Generally, it seemed that no systemic strategy plans would be used, which is important considering that mismanagement is a strong barrier for of e-learning implementation.
A conclusion of the SWOT model for the technicians, will be as following:

Table 6.8: SWOT model for Technicians

Strengths	**Weakness**
Distribution of experience Distribution of job roles Awareness level and know-how the online resources affective the learning and teaching level. Recognition by the management teams should formulate clear strategy to the technical staff.	Lack of strategy plans from managers or the management team Renew Blackboard system Lack of personal skills of technicians The quality of current Blackboard system performance. The barriers of e-learning implementation
Opportunities	**Threads**
Development of ICT & IT skills Financial support Active e-courses Adoption e-learning Accreditation on the blended learning Developing a Blackboard intranet The work as a team when solving the technical problems	Lack of technical training Lack of work as team Updating the Blackboard system needs to be done step by step Lack of motivation and incentives

6.3 SWOT analysis based on the answers provided by the students studying at School of Engineering from Tripoli University

From the results of section two in questionnaire 2 of Students (See Appendix B1, B2& B3);
Strength points came as the result of the respondents’ answers on the following questions: (see Figure 6.5/A, B, C & D)

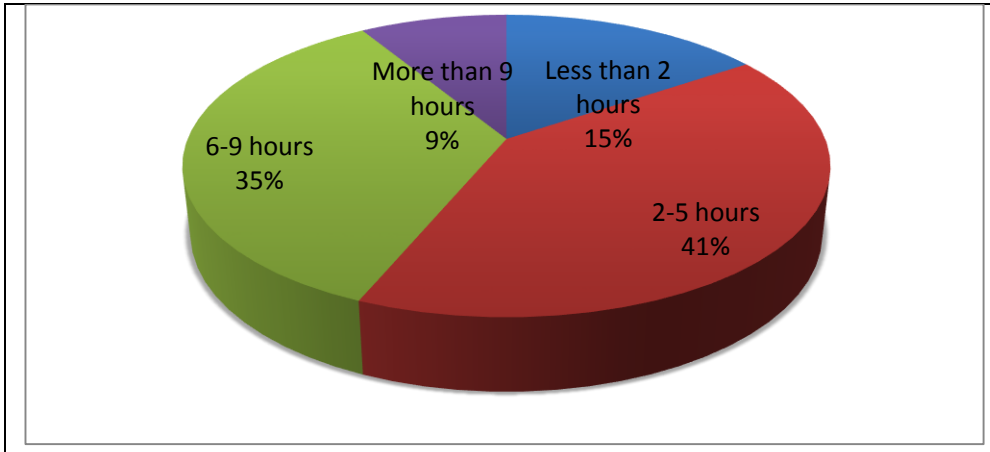
Quadrant A – shows the distribution of students' answers to question **Q9: How many hours do you spend using the Internet per day?** As shown in the figure, more than 40% from the students' percentage spend from 2-5 hours/day, and 35% spend from 6-9 hours/day. This is confirmed, since the new generation of students enjoys the exploration, searching and the group discussion as the new method in the teaching and learning style, also, internet usage became important within their study (Kenan et al., 2014)

Quadrant B – shows the distribution of students' answers to question **Q10: Do you have a job through your study?** The majority of Libyan people are interested in improving their qualifications so they enroll for BSc, MSc, and MPhil and PhD degrees. Some get a job after graduating from university, and then choose to study for higher degrees in order to improve their prospects for promotion and increase of salary (Kenan et al., 2015). The students' answers have confirmed this approach because 60% of students stopped their jobs to complete study, and 35% work part time to complete their degrees.

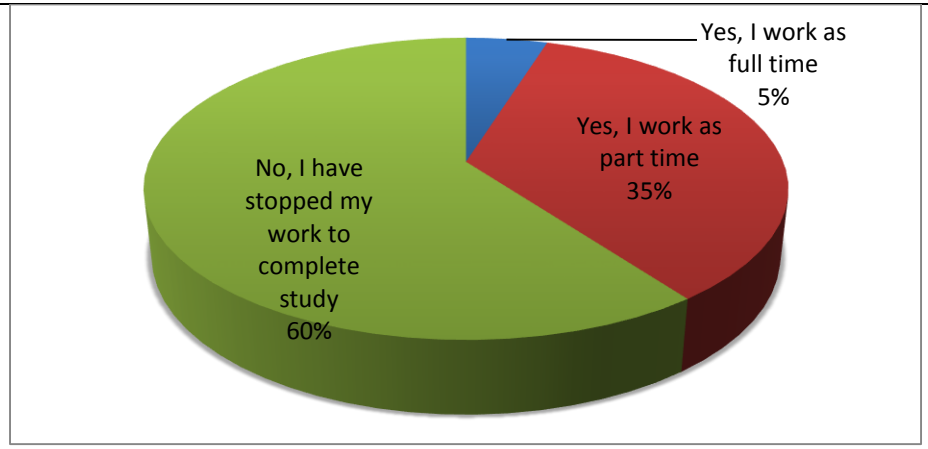
Quadrant C – shows the distribution of students' answers to question **Q13: Do you think that the use of online resources or ICT have added value to your learning?** The highest percentage of respondents (82%) agreed that the use of ICT and online resources have added value to their learning. Garcia & Escofet (2013) have studied the students' perceptions of the use of ICT in different learning dimensions and concluded that majority of students have received social, didactic and cognitive support when using the ICT (i.e. communication, monitoring of content, development of knowledge and skills; perception of learning; teacher and peer support, etc.).

Quadrant D – shows the distribution of students' answers to question **Q**14: **What should be included in the contents of e-courses?** The students preferred to access the e-library (85%), to read course materials online (71%) and to contribute to online discussion (55 %). These answers reflect the change of culture for the Libyan students who are keen on using ICT and the internet for teaching purposes (Bakeer, & Wynn, 2014).

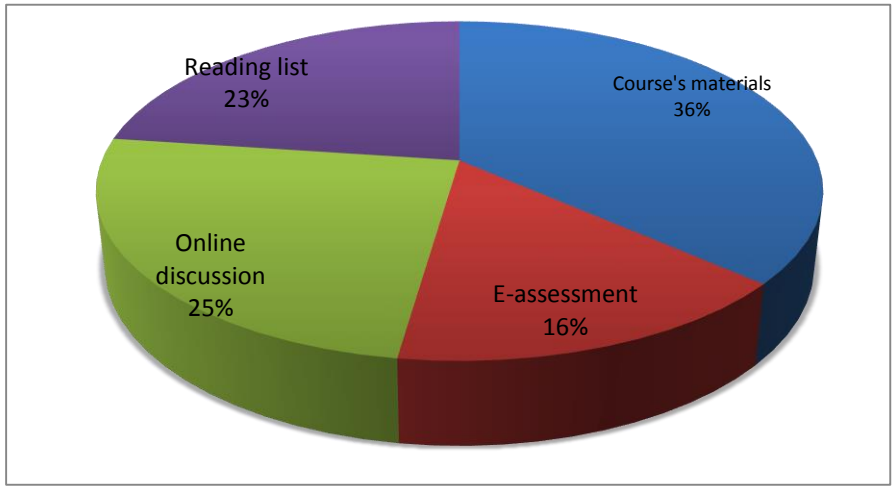
From the results of section two in the questionnaire, 2 of students (See Appendix B1, B2 & B3); Opportunities points came as the results from the respondents' answers on the following question was clear through view the e-learning advantages- it was **Q15: Please give your opinion about the following statements by ticking the appropriate box.** See table 6.9; this part of analysis, will explore the views and responses of the sample to the topic, under the title of 'the advantages of e-learning'. The opinions and responses of the study population were analysed, and the results were presented in questionnaire as following:
Also, Q12: How do you contact the Academic staff and your supervisor? & Q13 Do you think that the use of online resources or ICT have added value to your learning? It is could see the results of them in the Appendixes B2, B3.



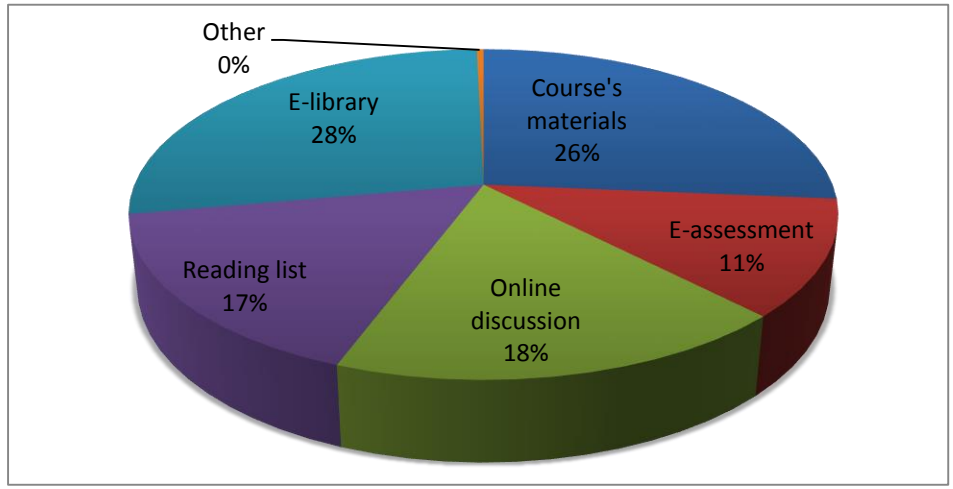
A. A number of hours that spends using the Internet per day



B. Have a job through your study?



C. Do you think that the use of online resources or ICT have added value to your learning?



D. In your opinion, what should be included in the contents of e-courses?

Figure 6.5: Strengths of SWOT of students studying at School of Engineering from Tripoli University

Table 6.9: The Opportunities' points for students

	Strongly Agree	Agree	I don't know	Disagree	Srongly Disagree
E-learning implementation will increase the efficiency of teaching.	72.2% (26)	22.2% (8)	5.6% (2)	0.0% (0)	0.0% (0)
I support the implementation of e-learning in all HEIs in Libya.	66.7% (24)	30.6% (11)	0.0% (0)	2.8% (1)	0.0% (0)
e-learning method is more flexible than the traditional methods.	30.6% (11)	52.8% (19)	13.9% (5)	2.8% (1)	0.0% (0)
Blended learning should be adopted by all Libyan HEIs.	27.8% (10)	22.2% (8)	33.3% (12)	13.9% (5)	2.8% (1)
E-learning should play an important role in curriculum development.	33.3% (12)	50.0% (18)	11.1% (4)	5.6% (2)	0.0% (0)
E-learning can contribute in solving some educational problems (such as increasing the number of students, access to distance learning materials by disabled people, house wives, learners in remote places like desert areas, etc.)	44.4% (16)	47.2% (17)	5.6% (2)	2.8% (1)	0.0% (0)
E-learning increases the students' motivation for learning.	36.1% (13)	50.0% (18)	13.9% (5)	0.0% (0)	0.0% (0)
E-learning contributes to acquision of IT skills.	41.7% (15)	41.7% (15)	16.7% (6)	0.0% (0)	0.0% (0)
E-learning assists the students to batter manage their time.	38.9% (14)	44.4% (16)	8.3% (3)	8.3% (3)	0.0% (0)
E-learning encourges the students to learn other languages	38.9% (14)	33.3% (12)	27.8% (10)	0.0% (0)	0.0% (0)

The weakness and threats of students came through the barriers view in the last chapter.
As conclusion to SWOT model for the students, will be as following:

Table 6.10: SWOT model for Students

Strengths	Weakness
Using the Internet and computer daily Continuous improvement of qualifications. Recognition of the management team responsibility regarding the strategy and practical aspects. Change of culture regarding the use of technology Passion and motivation for the use of modern media	Management barriers to e-learning implementation The expensive cost of Internet The low quality of ICT infrastructure on campus Lack of strategy plans from renewal of the learning and teaching methods The low level of Blackboard system performance.
Opportunities	**Threats**
Development of ICT and IT skills in LHEIs. Acquisition of foreign languages skills New technique for time management Adoption e-learning and blended learning Developing a Blackboard intranet Lecturers, technicians and students to work as a team when solving the e-learning problems	Lack of technical training for Lecturers and Technicians. Reticence of lecturers to use technology Reduced speed of incorporating the modern technology in the Higher Education Lack of updating the Blackboard system regularly. No annual evaluation for the lecturers and technicians

Libya has always been keen to ensure access to appropriate education for all members of its society, male and female (Kenan et al., 2015). The government system plans to improve and develop the ICT infrastructure and the entire educational process, including the development of curricula, updating its scientific content, and the adoption of ICT within education (Hamady, 2007). Libya plays a leading role, on both a business and an educational level, by promoting and sponsoring major initiatives and projects, including those in the neighboring countries of Sudan, Chad, Niger, Mali and Niger.

However, the poor and undeveloped infrastructure, combined with a lack of skilled, qualified teachers, ICT provision and ICT for teachers, presents great challenges to the current reform process (Kenan and Pislaru, 2012B). The first systematic study of the implementation of e-learning systems in Libya was conducted by Al-badree (2007), and this study indicated that the implementation process is still in its formative years.

The attempt to investigate e-learning is still at a case study stage, because the deployment of information and communications technologies is not widespread. However, educators have been attending training courses on e-learning implementation since 2002, and e-learning was subsequently integrated into the HE examination process in 2005.

Al-badree (2007) discussed the pedagogical, technological and attitudinal challenges related to this. The

introduction of e-learning programmes to the educational system of a specific country must take into consideration the social and cultural aspects of that country. The social and cultural background of the educators and learners plays a significant role in determining the success of e-learning education. This significance differs from one country to another, according to the values of the country and its customs and traditions (Pislaru, 2010).

The success or failure of an e-learning initiative will be directly related to the quality of strategic thinking that underpins it (El-zayat, 2010). The strategy should be sufficiently flexible to accommodate changes in the developments in e-learning products, services and technology (Kuhlen, 2006). This can be achieved through revisiting the strategy from time to time to ensure it keeps pace not only with changes in technology but also in teaching practices (Salem, 2014). An e-learning initiative must be tied to the institution's core business to ensure that that the quality of the educational processes is enhanced (Othman, et al., 2014).

The review recommends that the institutions should start working hard on minimizing the weaknesses (such as poor English skills of students as well as instructors, lacking ICT infrastructure, lack of e-learning know-how, etc.). Also the use of blended learning approach will enable the academics and students to have a smooth transition during the e-learning systems implementation (Kenan, et al., 2013A).

SWOT analysis also should help the decision-makers at the departmental level to decide on opportunities with respect to e-learning implementation and choose the appropriate policy issues for it, and the following should also be considered: improvement of the learners' knowledge, learning outcomes, efficiency of the teaching and learning processes and the reductions of costs.

SWOT analysis model in this thesis plays an important role to devise a new strategy with other factors; and from SOWT analysis for the Lecturers, Technicians and Students in the Engineering School of Tripoli University and the review regarding the education policy in LHEIs; can be summed up the Strength, Weaknesses, Opportunities and Threads points to the decision makers and the administration team as full SWOT analysis model. Table 6.11 is giving the highlight points of the SWOT model of the stakeholders in the Libyan HEIs., which are guiding to make a suitable strategy with consider the institutional, pedagogical and technological context.

Table 6.11: Modern SWOT model of e-learning implementation in Tripoli University

Strengths	**Weakness**
The government policy system has been changed on October 2011 when it was officially declared the liberation of Libya. So the new government looks to support the LHEIs in all the ways. The proliferation of digital technology because majority of people are using computers and social media channels to communicate with each other. Annual increase the student numbers in the LHEIs. The need to eliminate the administrative corruption aspects. Implement modern and efficient management structures in the LHEIs. Libya has a strategic geographical location in Africa. People Niger, Sudan, Mali and Chad could use the e-learning packages developed by the companies situated in the south of Libya. Also people living at long distances from the main Libyan universities (such as Awbari, Ghat, Aljawf, Murzuq and Alkoofra) could complete their courses by distance learning.	Lack of training courses for the students, technical and academic staff. Lack of technological support and periodic maintenance of computers. Lack of online library catalogues in the LHEIs The mismanagement and corruption. Users' lack of awareness and fear of negative consequences of using technology in education processes. Post-war chaos that pervades all sectors of Libyan society and economy. The higher teaching load of lecturers
Opportunities	**Threats**
Official recognition of education certificates holders of e-learning or distance education. Create new business strategies to attract students from other African countries that still lack the basics of e-learning in their Higher Education Institutes. An increased number of students are able to access the online course materials without attending the face-to-face lectures. Reduce the migration of skilled and intelligent people from Libya. Create techno-education competitive environment with the neighbouring countries. Development of new courses in foreign languages (English, French, etc.) in LHEIs. Gradual change of culture including more acceptances to of e-learning systems. Geographical position of Libya in Africa plays strategic role in the successful and the necessary need to implementation of e-learning system in LHEIs.	Numerous barriers related to e-learning systems implementation. Preference of using only academic traditional methods in education. Lack of support from the government. Increased migration of skilled and intelligent people from Libya. Lack of the strategic resources and the knowledge researches for the future education vision in Libya.

There are still many challenges that face a successful policy and suitable strategy of e-learning implementation. These challenges are mainly pedagogical, technological, and attitudinal (kenan, et al., 2012C), and are as follows:

Lack of training courses and languages Skills: Although most LHEIs provide each faculty member with a personal computer, a significant percentage of faculty members are still computer illiterate, and one might reasonably estimate resistance from those members toward any attempt to adopt an e-learning model in their discipline within the university. Also, some faculty members have difficulty with the English language. Even though, this research found interesting results from the lecturers' respondents in answering by English languages more the Arabic languages.

Strong student- lecturer power structure: Staff teams in the Arabic universities in general and in Tripoli University in particular fear that e-learning would abruptly shift traditional education into a new pedagogical venture for which lecturers and policymakers are not sufficiently familiar. Even in the results of the questionnaires of the lecturers and the technicians there is some evidence of that (see chapter 5 + chapter 8). In Libya there has been a strong power structure governing the relationship between students or student and a lecturer, and any students may feel subservient to the lecturer and this could prove a problem when the student is asked to discuss his/her views freely with the lecturer. This is finding also as observation in the notes and the comments that came from the student's questionnaire in section 4 (in chapter 8).

Lack of Arabic learning tools and applications for E-learning courses: This will be a serious challenge in implementing e-learning into LHEIs, where Arabic language is the teaching language. But even for the science based colleges, where English is the official teaching language, the lack of Arabic learning applications might cause a problem for a large proportion of students. This comes as a conclusion from the many questions-answers in the three different questionnaires in section three, which results as general barriers front of the e-learning implementation (see chapter 5).
Lack of interests by university administrations regarding the possibilities of e-learning is also a real challenge:

Highest load on the academic staff: The teaching load in Libyan universities is typically large, for example, the average number of teaching hours for academic staff is 24 hours per week, and Libyan universities have not yet established an academic research tradition (Elzawi, &Underwood, 2010). Thus, even professors find it difficult to find the time for research activity and educational development. The Libyan business executive survey/global competitiveness report (LBES/GCR) ranks Libya 97th out of 111 countries in university/industry research collaboration (Elzawi, et al., 2012B). Some academic staff do undertake extra activities, such as writing and publishing, e.g. text books, to increase their income. Also, in the analysis, the data of this research for the lecturers, there is clear percentage of the teaching hours for the lecturers in (chapter 5)

Lack of official recognition by the qualifications of online studies: teaching and learning are the cornerstones of any HEI. However, maintaining the quality of such processes is a continuous challenge. There is no official recognition in Libya for distance or online learning as a valid mode of education and most LHEIs have not appointed staff members with formal qualifications in either distance learning or online learning (kenan, et al., 2014).

Once the key players are committed to the implementation process, quality control and measurable outcomes must be considered as part of implementation (Martilla & James, 1997). So the SWOT analysis should look at the main policy issues, the strategy trends (such as the economic situation), social impacts and technological developments.
Hollings centre reported in (Dialogue Snapshot) in March 2014 about “Expanding Opportunities for Libyan Higher Education” as a future plan to LHEIs. The report indicated that barriers to setting a full vision and founding a national strategic plan are important and significant, particularly as there are instant majority stresses for the change in the HEIs. The important inadequacies and weaknesses acknowledged within the members of that dialogue, which are included: the security; capacity problems of campus and increase students numbers; poor campus environment; faculty; poor IT infrastructure; student culture challenges; quality assurance (Hollings centre, 2014).

Therefore, e-learning requires more than just technology to be successful. There is the need for academic professionals who are well trained in ICT, capable of using e-learning systems and developing learning materials that address the needs of students. Locally based technicians are also required to maintain equipment as well as e-learning systems and tools (Impes, et al.,2014).

To explain this significance further, (chapter 9) shall review the development of a novel e-learning strategy, and the relationship between the main stakeholders in School of Engineering at Tripoli University.

6.4 Chapter summary

The strategy that will be evident after the evaluation, through the focus on the Strengths and the Opportunities for the three groups of the questionnaires, whilst the Barriers comes as the Weakness and the Threats.

This chapter represented the SWOT model to each category from the stakeholders (Lecturers, Technicians and students) separately, and then presented a completely SWOT for all the stakeholders including the management team and the policy makers and the government responsible team in the Engineering school at Tripoli university SWOT model depended on the results of the three questionnaire, this chapter presented the positive points clearly throughout the Strength points and the Opportunities; whilst the Weakness and Threats came as results from chapter 5.

Also, based on the study of the latest results related in 2009 to recent SWOT analyses. Kenan in 2009

research presented the need to solve the problems and the challenges the HEIs in Libya as Strength point, and the technical, cultural and other challenges as Weakness. However, she discussed about loving the new generation both teachers and students to applied the new methods in the education as Opportunity point, but still the neglect and stagnation of the decision makers are representing a big threat front of the Libyan HEIs.(Abusrewel, 2014).

Kenan in 2013 presented a conference paper by title of: “Trends and Policy Issues For The E-Learning Implementation In Libyan Universities” in London conference, which discussed the e-learning strategy stages and the necessity of making the transition from the traditional learning to e- learning, the results from that study has concluded the SWOT model to be as a reference to the LHEIs. This paper has won ‘best conference paper’ and was published as journal paper in 2014. (See the references).

Next chapter will present the design for development and implementation of an e-learning package as personal tutorial; which is offering three case studies within the research study at the School of Engineering in Tripoli University.

Chapter 7: Proposed novel I-CUBE model for the development of teaching and learning activities

This chapter presents the details of the proposed novel I-CUBE model, which can be used for the development of teaching and learning activities in the twenty-first century. The chapter contains the qualitative analysis of the answers provided by lecturers, technicians and students to the open-ended questions included in questionnaires. The chi-square analysis for the answers given by the lecturers, students and technicians for the close-ended questions have been completed using SPSS. There were some common opinions, which enabled to make correlations between the stakeholders' points of view and to construct the surfaces which have been included in the I-CUBE model.

The sources of information for the proposed I-CUBE model were as follows:

- Quantitative and qualitative analysis of the answers provided by lecturers, technicians and students to the questionnaires – see Chapter 5
- Conclusions for the SWOT analysis – see Chapter 6
- Researcher's reflections of the design, development and implementation of the e-learning package
- Study of the relevant publications – see Chapter 2
- Researcher's personal experience – as a BSc student and then lecturer at the School of Engineering at Tripoli University and as a PhD student in the School of Computing and Engineering at the University of Huddersfield, UK.

7.1 Qualitative analysis of the answers provided by lecturers, technicians and students to the questionnaires

The close-ended questions focused the respondents' attention on specific aspects related to the implementation of e-learning in Higher Education. So, the open-ended question offered the respondents a chance to express their opinions and feelings about anything else which was not included in the multiple-choices for the close-ended questions or could clarify responses and/or specify unanticipated issues which are important for the respondents.

The open-ended questions lends the questionnaires more support, because the close-ended questions will be analysis by quantitative whilst the open-ended question will be analysis by qualitative method (Oppenheim, 1992).

Numerous references have indicated to it most literature resources discussing methods of analysing qualitative data; that the best way of analysing qualitative data is to convert speech into meaningful categories. These categories are used to code the comments, replays and responses received from the interviewee or his comment. (Moser and Kalton, 1993; Robson, 2002) This coding process helps in finding

themes, similarities and common responses in the interview data or End-opened comment (Charmaz, 2006). In this thesis, the coding was manually to some new opinions and comments from the stakeholders.

7.1.1 Answers provided by Lecturers to open-ended questions:

A number of 23 Lecturers (51 % of total number of Lecturers) have included some comments in the section for the open-ended question. They could be classified in three main topics as follows:
One respondent wrote that: "In my opinion the online environment is a very successful discovery, especially through communication between individuals anywhere and anytime, because the world has become a small village. This in turn has been reflected in all fields including social, scientific, political and even cultural domains with all advantages and disadvantages"

Goonasekera (2001) analysed the notion of the *'global village'* showing that it has encouraged the widening and speeding-up of worldwide correlations in all aspects of contemporary social life. Castells (2008) specified that the global village can be viewed as a threat to cultural identities so there are different opinions regarding the advantages and disadvantages of online environments.
The second respondent mentioned that: *"We want from the ministry to generate a good strategy for online curriculum"*
Hollings Centre (2014) prepared a report regarding the vision of the Libyan government elected in 2012 regarding the future of Libyan higher education. Its aim is to create "*world class universities (WCUs) that would help diversify Libya's economy and turn Libya into a hub of academic achievement*". Thus, the government has a strategy for the online curriculum but it seems that it has to be better presented to the academic staff from universities.
The third respondent wrote that: *"When I log in to the web site of university that is built recently, I find it down or have missing pages and links."* Rhema (2013) indicated in her thesis on the ICT infrastructure in Libyan HEIs and the low speed and limited quality in the Libyan universities.

7.1.2 Answers provided by Technicians to open-ended questions:

A number of 3 technicians (25 % of total number of technicians) have included some comments in the section for the open-ended question. They could be classified in two main topics as follows:

One respondent wrote: *"...This method of learning is not suitable in Libya ... because of technology literacy, and especially in this moment."* It was obvious that the technicians are lacking the practical skills related to the use of modern technology for e-learning systems. One factors affecting this issue is the lack of ICT training courses (see Chapter 5). These factors correlated with strong traditional cultural influences, which do not encourage people to use modern technology, have reduced the level of motivation for technicians.

Another respondent wrote, *"Who will use e-learning? Most people don't have PCs because they can't afford it, and those who have the PCs they use them for playing online games"* The respondent has confirmed

the general opinion of PCs, and the link to internet are expensive. ITU (2013) confirmed that the broadband price as percentage of Gross National Income (GNI) per capita per month is one of the highest from MENA countries.

The third one wrote: *"We have PCs in the Lab rooms, although it might be out of date, but it do the job."* The International Computer Driving License (ICDL) course was Failure in Libya, which was on 2007. ICDL is a certificate awarded by UNESCO, because of lack of readiness for the technological projects. (UNESCO, 2005B)

7.1.3 Answers provided by students to open-ended questions:

A number of 24 students (23% of total number of students from Tripoli University and those studying at UK universities) have included some comments in the section for the open-ended question. They could be classified in two main topics as follows:

One respondent said: "I like use the Internet in my learning as more as my using it often, mainly in chatting, Facebook and Twitter with my friends". This comment confirmed the new generation from the students and how they like the technologies usages, it is a positive point to insert the learning method via these technologies.

Othman et al., (2014) stated that ICT plays a huge role in knowledge transfer, and for Libya to have sufficiently competent knowledge workers, the government must ensure an education system able to play a key-supporting role. For example, ICTs must be introduced in schools from an early age if the success of online learning is to be ensured.

A further respondent said: *"There is nothing in my study that lets me to use the internet, I usually memorize the content of the subjects' books or notes."*

Here, another face to support the traditional method in the teaching, otherwise, lack of alternative modern method in teaching. (UNESCO, 2005A) stated that most of the Higher education institutions throughout the world are in a period of rapid change, as changes occurring in the primary processes of higher education courses and degree granting are closely related to the contextual trends of virtualization, internationalization, lifelong learning and customer orientation, which are part of society in general. In this context, traditional universities have no choice but to significantly alter their instructional methods to keep pace with developments spurred by the Internet.

Again, another respondent wrote: *"I don't have a PC at home and I can't use the computer lab at the university unless there is a lesson session, otherwise there is not available public library included some computers"*

If the tools it is not available; the user cannot work and cannot evaluate the performance. This comment confirmed the lack of strategies from the institutional and the technical contexts.

Other one wrote: *"I signed up for an e-mail account on the university website, but I can't use it as most of time it is down"* This confirmed the quality of blackboard of university and the VLE there. As a conclusion from the open-ended section for the stakeholders; the results could conclude as following codes:

1. Possession or ownership of PCs.
2. Use of computers.
3. Internet accessibility.
4. Technology skills.
5. Infrastructure available nationally and in universities.
6. Satisfaction of university ICT infrastructure
7. Policies and standers to regulate e-learning

These codes were used to categorise the responses and comments made from the open-ended sections. These helped in understanding the perceptions of the sample regarding the factors investigated in this research. Seemingly, if the lecturers and the technicians have been appropriately trained in the use of well-designed tests, they will be able to diagnose the difficulties that hinder students' mastery of a certain point, and provide them with explanations and additional or alternative training to be proficient in that point.

7.2 Using SPSS for the quantitative analysis of the answers given by the lecturers and technicians

This analysis presented the level of differences of opinions of the technicians and the lecturers and tested this level; due to many studies and researches have stated the lecturers' load and lecturers' resistances and traditional method of teaching. Numerous references included this thesis have indicated the important role which play via the lecturers to success the e-learning in LHEIs.; such as (Ezawi et al., 2013B; Rhema, 2013, Kenan et al., 2014, Othman, 2014; Hamdy, 2007) and there are many else. In this analysis section, regarding the SPSS functions, it will be discovered whether there are different performance significance between the technicians and the lecturers or not.

This views of lecturers and technicians towards being elements leading to achieve a successful e-learning implementation in LHEIs could be different. As a result, it was important to examine whether or not there is difference between the lecturers and technicians in terms of the underlying elements.

7.2.1 Important factors to achieve a successful E-learning implementation in Libyan Higher Education Institutions

From Q11 for the lecturers & Q12 for the technicians: "Which of the following do you consider as the most important element to achieve a successful E-learning implementation in LHEIs?" the options of answers come from Table 7.1 to 7.6 (To more explain; see appendixes A & C).

In terms of development of ICT, 82.9% of lecturers and 72.7% of technicians found that this element was essential, see Table 7.1 since the resulting percentages were further high for the both jobs, indicating that

the development of ICT was, in fact, important. According to the chi-square test, no significant difference in the important percentage of development of ICT between the lecturers and technicians was detected (Chi-square (exact test) =0.545, p-value=0.460). Because of the question have nominal variables, it is suitable to use Chi-square test to give the p-value that has less than 0.50; therefore the difference here has no significant.

Table 7.1: Cross tabulation for type of job and development of ICT

			Job		Total
			Lecturers	Technician	
Development of ICT	No	Count	7	3	10
		% Within groups	17.1%	27.3%	19.2%
	Yes	Count	34	8	42
		% Within groups	82.9%	72.7%	80.8%
Total		Count	41	11	52
		% Within groups	100.0%	100.0%	100.0%
Chi-square (exact test)= 0.545 & p-value= 0.460					

For financial support, 52.2% of lecturers and 54.5% of technicians thought that this element was essential, these percentages indicated that there was no obvious attitude towards the importance of financial support. See Table 7.2 According to the chi-square test, no significant difference in the important percentage of financial support between the lecturers and technicians was found (Chi-square = 0.038, p-value = 0.845). If p-value is less than .05, then the result is significant, here p-value=0.845 is higher .05, so the result is not significant.

Table 7.2: Cross tabulation for type of job and financial support

			Financial support		Total
			No	Yes	
Job	Lecturer	Count	20	21	41
		% Within Financial support	48.8%	52.2%	78.8%
	Technician	Count	5	6	11
		% Within Financial support	45.5%	54.5%	21.2%
Total		Count	25	27	52
		% Within Financial support	100.0%	100.0%	100.0%
Chi-square =0.038, p-value=0.845					

For active e-courses, 41.5% of lecturers and 36.4% of technicians, which were less than half, defined the active e-courses as essential element, see Table 7.3 The resulting percentages indicating that it seemed to be apparent attitude towards the unimportance of active e-courses,. According to the chi-square test, no significant difference in the important percentage of active e-courses between the lecturers and technicians was found (Chi-square =0.094, p-value=0.760). Here p-value=0.094 is higher .05; therefore, the result is not sig.

Table 7.3: Cross tabulation for type of job and active e-courses

			Active e-courses		Total
			No	Yes	
Job	Lecturers	Count	24	17	41
		% Within Active e-courses	58.5%	41.5%	78.8%
	Technician	Count	7	4	11
		% Within Active e-courses	63.6%	36.4%	21.2%
Total		Count	31	21	52
		% Within Active e-courses	100.0%	100.0%	100.0%
Chi-square =0.094, p-value= 0.760					

Similar to active e-courses, given in Table 7.3, 41.5% of lecturers and 36.4% of technicians found that imposing the blended learning was essential, indicating that there seemed apparent attitude towards the unimportance of imposing the blended learning, see Table 7.4 According to the chi-square test, no significant difference in the important percentage of imposing the blended learning between the lecturers and technicians was found (Chi-square =0.094, p-value=0.760). The p-value more than 0.5, therefore, no significant difference.

Table 7.4: Cross tabulation for type of job and imposing the blended learning

			Imposing the blended learning		Total
			No	Yes	
Job	Lecturers	Count	24	17	41
		% Within Imposing the blended learning	58.5%	41.5%	78.8%
	Technician	Count	7	4	11
		% Within Imposing the blended learning	63.6%	36.4%	21.2%
Total		Count	31	21	52
		% Within Imposing the blended learning	100.0%	100.0%	100.0%
Chi-square (exact test)=0.092, p-value=0.762					

For developing blackboard internet, 46.3% of lecturers and 36.4% of technicians thought that developing the blackboard internet was essential, these percentages indicating that there seemed an apparent low attitude towards the impact of active e-courses, see Table 7.5 According to the chi-square test, no significant difference in the important percentage of developing a blackboard internet between the lecturers and technicians was found (Chi-square (exact test) =0.343, p-value=0.558).

Table 7.5: Cross tabulation for type of job and developing a blackboard intranet

			Developing a Blackboard intranet		Total
			No	Yes	
Job	Lecturers	Count	22	19	41
		% Within	53.7%	46.3%	78.8%
	Technician	Count	7	4	11
		%	63.6%	36.4%	21.2%
Total		Count	29	23	52
		%	100.0%	100.0%	100.0%
Chi-square (exact test)=0.343, p-value=0.558					

For the importance of other elements, 90.2% of lecturers and 100% of technicians defined other elements, which were not of interest in this study, since they are not essential for successful e-learning. As a result, there was a very high agreement between both jobs and the availability of other elements, which was not mentioned in this study, to achieve successful e-learning implementation in Libyan Higher Education Institutions (see Table 7.6). According to the chi-square test, no significant difference in the important percentage between the lecturers and technicians was found (Chi-square (exact test) =1.14, p-value= 0.286), and hence they share the same attitude.

Table 7.6: Cross tabulation for type of job and the importance of other elements

			Others		Total
			No	Yes	
Job	Lecturers	Count	37	4	41
		% Within Others	90.2%	100.0%	9.8%
	Technician	Count	11	0	11
		% Within Others	100%	0.0%	21.2%
Total		Count	48	4	52
		% Within Others	100.0%	100.0%	100.0%
Chi-square (exact test)=1.14, p-value=0.286					

7.2.2 Most resistant group to the E-learning implementation

From Q13 for the lecturers & Q15 for the technicians: *"Which group has been the most resistant to the E-learning implementation in LHEIs?"* the options of answers come in Table 7.7 (To more explain; see appendixes A2, A3, C2 & C3).

In terms of the most resistant to e-learning implementation in LEIs, the opinion of lecturers and technicians with respect to being influential resistant to the e-learning could be different. As a result, it was important to discover whether the type of jobs led a difference in the percentages of resistant groups (Administrative staff, Students and researchers, Government team and Technical staff) in the university.

According to Table 7.7, both lecturers and technician attributed the most repentant to the government team, namely 43.9% of lecturers and 36.4% of technicians. Then, on the others hand, 31.7% of lecturers attributed the issue to limited staff, whilst 27.3% of technician attributed to academic staff. Technical staff seemed to be not resistant according to 9.8% and 0% of lecturers and technicians, respectively. Using the Chi-square test, there was no significant relationship (Chi-square (exact test) =5.097, p-value=0.206) Chi-square has a large value here; p-value was less than 0.5; therefore, there is difference between the type of job and the resistant groups to the e-learning implementation in Libyan higher education. The question has five groups; the option of answers was yes or no; therefore, all the variables in same table.

Table 7.7: Cross tabulation for the most resistant to the E-learning implementation in LHEIs and type of job

			Which group has been the most resistant to the E-learning implementation in Libyan Higher Education?					Total
			Admin Staff	Student & Research	Gov. team	Academic Staff	Technician	
Job	Lecturer	Count	13	2	18	4	4	41
		% The most resistant	31.7%	4.9%	43.9%	9.8%	9.8%	100.0%
	Technician	Count	2	2	4	3	0	11
		% The most resistant	18.2%	18.2%	36.4%	27.3%	0.0%	100.0%
Total		Count	15	4	22	7	4	52
		%	28.8%	7.7%	42.3%	13.5%	7.7%	100.0%
Chi-square (exact test)=5.097, p-value=0.206								

7.2.3 Highest number of barriers for the practical implementation of E-learning systems

From Q12 for the lecturers & Q14 for the technicians: *"Which area contains the highest number of barriers for the practical implementation of E-learning systems in LHEIs?"* the options of answers come in Table 7.8 (for a further explanation; see appendixes A2, A3, C2 & C3).

Table 7.8, the highest percentage was observed for mismanagement barriers, which was 42.3% of total sample, from which 39% and 54.5% represented the lecturers and technicians, respectively. Secondly, 36.3% of total sample attributed the issue to the technological barriers, from 39% represented the lecturers whilst 27.3% represented the technicians. Overall, the lecturers seemed to attribute the issue to technological barriers whilst the technicians attributed to mismanagement barriers. Using the (Chi-square (exact test) =0.865, p-value=0.682). No significant difference between the types of jobs with respect to the type of barriers for the practical implementation of E-learning systems in Libyan Higher Education.

Table 7.8: Cross tabulation for the job type and the highest number of barriers for the practical implementation of E-learning systems.

			Which area contains the highest number of barriers for the practical implementation of E-learning systems in LHEIs			Total
			Technical	Cultural	Mismanage.	
Job	Lecturer.	Count	16	9	16	41
		% Within barriers	39.0%	22.0%	39.0%	100.0%
	Technician	Count	3	2	6	11
		% Within barriers	27.3%	18.2%	54.5%	100.0%
Total		Count	19	11	22	52
		% Within barriers	36.5%	21.2%	42.3%	100%
Chi-square (exact test)=865, p-value=0.682						

7.2.4 Satisfaction with the Internet speed in university campus

From Q14 for the lecturers & Q16 for the technicians: *"Are you satisfied with the Internet speed in your university campus?"* the options of answers come in Table 7.9 (To more explain; see appendixes A2, A3, C2 & C3).

E-learning development strongly relies on internet speed. Table 7.9 shows that 24.4% and 26.8% of the lecturers were unsatisfied and strongly unsatisfied, respectively, whilst 27.3% and 27.3% of the technicians were unsatisfied and strongly unsatisfied, respectively. For satisfaction with the speed, just 12.2% represented the lectures, whilst 36.4% represented the technicians. The resulting median was in the range of neutrality for both lecturers and technicians. Using Mann-Whitney test, there was no significant difference in the level of satisfaction with internet speed between the lecturers and technicians. (Z=-0.264, p-value=0.792) because the satisfied variables are not numeric, so should use non-parametric test (Mann-Whitney). The negative sign is a result of difference between mean ranks of Median; whereas the technicians have lower mean rank than lecturer, the z become negative. But the value it is given the difference without considering the sign.

Table 7.9: Difference in satisfaction with Internet speed using Mann-Whitney

Job	Are you satisfied with the Internet speed in your university campus?					Median	Z	P-val.
	Strong Satisfy	Satisfied	I don't know.	Unsatisfied	Strong Unsatis			
Lecturer	12.2	12.2	24.4	24.4	26.8	2.55	-0.264	0.792
Technician	9.1	36.4	-	27.3	27.3	2.43		

7.2.5 Cost of off-campus Internet access

From Q15 for the lecturers & Q17 for the technicians: *"The options of the cost of off-campus Internet access is?"* the options of answers come in Table 7.10 (To more explain; see appendixes A & C).

The results given in Table 7.10 indicated that 8.9% and 31.7 of the lecturers thought that the cost of off-campus internet access was highly expensive and expensive, respectively, and this resulted in 50.5% of lecturers total generally considered it expensive. 41.5% of the lecturers did not know about the cost. With respect to the technicians, 9.5% and 27.3% of them considered it as highly expensive and just expensive, respectively, and hence, it was found that 36.3% of technicians total thought it was generally expensive. In fact, the technicians showed a minor tendency towards considering the cost as cheap (36. %) and normal (18.2%), whist the lecturers did not consider it cheap at all (0%) but could considered it to be normal (17.1%). In general, using the resulting median, the lecturers and technicians seemed to have no idea about the cost. This result was confirmed by the Mann-Whiney test, where there were significant differences in the cost between the lecturers and technicians. (Z=1.53, p-value=0.126) the Mann-Whitney test here is based z value to test the difference in median.

Table 7.10: Difference in the cost of off-campus Internet access using Mann-Whitney

	The cost of off-campus Internet access					Median	Z	P-value
	High expensive	Expensive	I don't Know	Normal	Cheap			
L.	9.8%	31.7%	41.5%	17.1%	-	1.67	1.53	0.126
T.	9.1	27.3	9.1	36.4	18.2	2.40		

7.2.6 Attendance to IT training courses

From Q16 for the lecturers & Q18 for the technicians: *"How many IT training courses have you attended in this academic year?"* the options of answers come in Table 7.11 (To more explain; see appendixes A2, A3, C2 & C3).

For the lecturers, the number of attending training courses seemed to be between 3-4 courses (31.7%) and more than four courses with a low percentage (41.5%), see Table 7.11. Also, for the technicians, the number attending training courses seemed to be low for 3-4 courses (9.1%), and the same percentage was observed for more than 4 courses (9.1%).

Although both type of jobs showed a high number of no attendance, it was noted that the percentages of technicians who did not attend any course was higher (72.7%) than the lecturers (53.3%). Based on the resulting median, both jobs showed a tendency of no attendance to training courses. Using the Mann-Whitney test, there was significant difference (Z=-0.930, p-value= 0.252) in the number of attendance IT training courses between the two jobs.

Table 7.11: Difference in attendance IT training courses using Mann-Whitney

Job	How many IT training courses have you attended in this academic year?				**Median**	**Z**	**P-value**
	No Course	1-2 Courses	3-4 Courses	Mor. 4 Courses			
Lecturer	53.7%	26.8%	7.3%	12.2%	0.58	**-930**	**0.252**
Technician	72.7%	9.1%	9.1%	9.1%	0.33		

7.2.7 Resources used in the classroom

From Q18 for the lecturers & Q19 for the technicians: *"Which resources are been used in the classroom?"* the options of answers come from Table 7.12 to Table 7.17 (To more explain; see appendixes A2, A3, C2 & C3).

Flip chart or Marker-board: From Table 7.12, it was noted that 63.4% of the lecturers used flip charts or marker-boards in the classroom, whilst just 9.1% of the technicians who did. Using the Chi-square test, there was significant difference (Chi-square=10.24, p-value=0.002 in percentage of using flip chart or marker-board between the job types.

Table 7.12: Crosstab for resources used in the classroom and job type

			Which resources are been used in the classroom: **Flip chart or Marker-board.**		**Total**
			No	**Yes**	
Job	**L.**	Count	15	26	41
		% within resources	36.6%	63.4%	100.0%
	T.	Count	10	1	11
		% within resources	90.9%	9.1%	100.0%
Total		Count	25	27	52
		% within resources	48.1%	51.9%	100.0%
Chi-square=10.24, p-value=0.002					

Projector: It was noted that 58.5% of the lecturers used projector in the classroom, whilst 36.4% of technicians did, see Table 7.13 As a result, the technician seemed to be less interested in using the projector than the lecturers. However, using the Chi-square test, there was no significant difference (Chi-square=0.092, p-value=0.762) in percentage of using the projector in the classroom between the job types.

Table 7.13: Crosstab for resources (projector) used in the classroom and job type

			Which resources are been used in the classroom: **Projector**		**Total**
			No	Yes	
Group	**L.**	Count	24	17	41
		% Within groups	58.5%	41.5%	100.0%
	T.	Count	7	4	11
		% Within groups	63.6%	36.4%	100.0%
Total		Count	31	21	52
		% Within groups	59.6%	40.4%	100.0%
Chi-square (exact)=0.092, p-value=0.760					

Computer for presentation: From Table 7.14, it was found that 19.5% of the lecturers used computer for presentation in the classroom. It seemed that the lecturers were not interested in using computers for presentation. About half of the technicians (54.5%) used computers for presentations. Based on the Chi-square test, there was significant difference (Chi-square=5.30, p-value=0.030) in percentage of using computer for presentation between the job types.

Table 7.14: Crosstab for resources (computer for presentation) used in the classroom and job type

			Which resources are been used in the classroom: **Computer for presentation**		**Total**
			No	Yes	
Groups	**L.**	Count	33	8	**41**
		% Within groups	80.5%	19.5%	**100.0%**
	T.	Count	5	6	**11**
		% Within groups	45.5%	54.5%	**100.0%**
Total		Count	38	14	**52**
		% Within groups	73.1%	26.9%	**100.0%**
Chi-square (exact) = 5.30, p-value = 0.030					

Internet connection by cable: From Table 7.15, it was found that, just, 7.3% and 9.1% of the lecturers and technicians, respectively, used internet connection by cable in the classroom. As a result, there was a

strong indication of not being the internet connection in the classroom. Using the Chi-square test, there was no significant difference (Chi-square=0.038, p-value=0.846) in the low percentage of using internet connection by cable in the classroom between the job type.

Table 7.15: Crosstab for resources (internet connection by cable) used in the classroom and job type

			Which resources are been used in the classroom: **Internet connection by cable**		**Total**
			No	Yes	
Groups	**L.**	Count	38	3	41
		% Within groups	92.7%	7.3%	100.0%
	T.	Count	10	1	11
		% Within groups	90.9%	9.1%	100.0%
Total		Count	48	4	52
		% Within groups	92.3%	7.7%	100.0%
Chi-square=0.038, p-value=0.846					

Internet wireless connection: Based on Table 7.16, it was found that 7.3% and 18.2% of the lecturers and technicians used internet wireless connection in the classroom. The result indicated that there was weakness in using the internet, especially among the lecturers. Using the Chi-square test, there was significant difference (Chi-square1.15, p-value=0.282) in percentage of internet wireless connection in the classroom between the job types.

Table 7.16: Crosstab for resources (internet wireless connection) used in the classroom and job type

			Which resources are been used in the classroom: **Internet wireless connection**		**Total**
			No	Yes	
Job	**L.**	Count	38	3	41
		% Within groups	92.7%	7.3%	100.0%
	T.	Count	9	2	11
		% Within groups	81.8%	18.2%	100.0%
Total		Count	47	5	52
		% Within groups	90.4%	9.6%	100.0%
Chi-square (exact)=1.15, p-value=0.282					

Smart board: According to Table 7.17, 2.4% of the lecturers used smart boards in the classroom, whilst 18.2% of technicians used them. The result indicated that there was weakness in using the internet, especially among the lecturers. Using the Chi-square test, there was significant difference (Chi-square=3.87, p-value=0.049) in percentage of smart board in the classroom between the job types.

Table 7.17: Crosstab for resources (smart board) used in the classroom and job type

		Which resources are been used in the classroom: **Smart board**		**Total**
		No	**Yes**	
L.	Count	40	1	41
	% within groups	97.6%	2.4%	100.0%
T.	Count	9	2	11
	% within groups	81.8%	18.2%	100.0%
∑	Count	49	3	52
	% within groups	94.2%	5.8%	100.0%
Chi-square (exact)=3.87, p-value=0.049				

In brief, from the SPSS tests and functional statistical analysis results; and although the lack significant and it differences; the technical staff have related a strength relationship with the lecturers in the attitudes and the performance with some different in the opinions defiantly. Through the mutual and alternate information. Via the internet and the intranet (the Blackboard) or the VLE of the university. Also, the success of this relationship has depended on the individual skills.

7.3 Derived correlation between Lecturers and Technicians points of view

From all these views and the analysis results; the researcher considered four factors represented the relationship to success the development in the e-learning as general. These four consideration factors could drown as Square or LT surface as following figure:

The four edges or the consideration of the LT surface represent: the information, the Internet, the individual skills and the intranet.

Each edge plays an important rule into the success of e-leaning performance as follows:

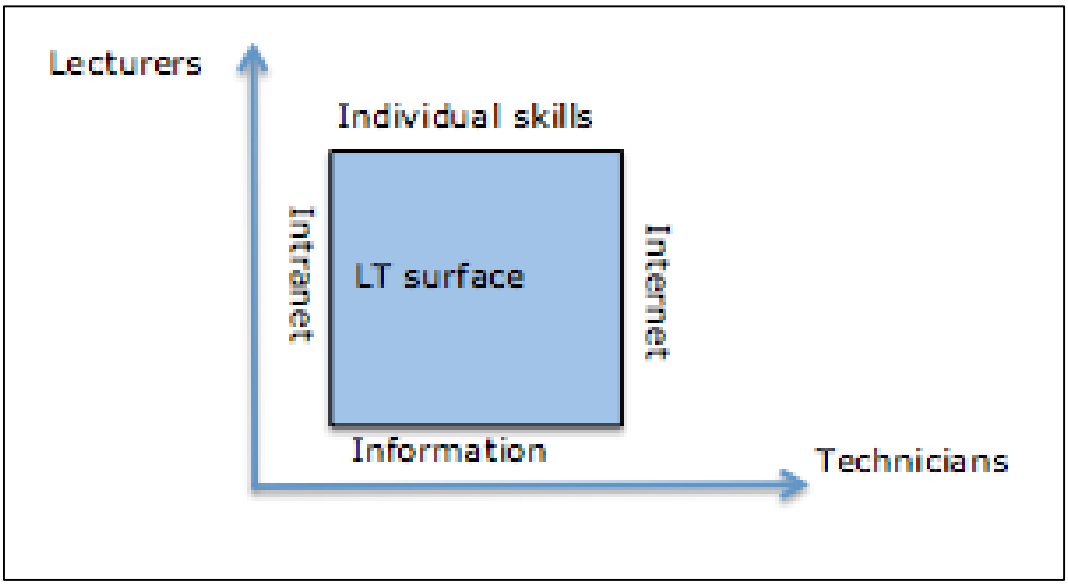


Figure 7.1: The relationship between the Lecturers and the Technicians

1. The Information: This includes the general information and the essential details, courses materials, curriculum content, personal data, etc. Any institution likes to develop a new style of e-learning course materials, which includes developing reusable learning objects; which are defined the objects as *"any entity, be it digital or non-digital, that may be used for education and training"* (Oliver, 2001, p-36).

2. The Internet: This includes all the resources of technology from the Wide World Web (WWW.) and overall related via usage the applications and how applies it in the teaching & learning. From the collection data of the questionnaires of the lecturers and the technicians, there are many related results regarding it.

3. The Intranet: This is the real relationship between the Ls & Ts. via the ICT and the VLE tools that available for the Ls to help them to doing their work. This VLE or the intranet, which is created and period maintaining from the Ts team.

4. The individual skills: These are the important skills that depend on the continuous training to support the experience of both to high cooperating in higher education systematic work; whereas, it is dependent on the continuous training level and the personal satisfaction in the technical skills; for the lecturers there are many courses to develop the presentation skills and teaching tools; such as: “Slide share; Screener; Animoto; Popcorn maker; Wordlle; Prize and many Software applications”.
However, the technicians often complain about the management team and administration staff where they work sometimes have very little knowledge of what they do. A lot of lost time of technicians’ working time is spent in the preparing Labs. There is some misunderstanding regarding the technicians’ roles; many see technicians as departmental administration assistants.

7.4 The relationship between the Lecturers and their students

The pedagogical history in HE presented various theories, models, frameworks regarding to the relationship between the teachers or the lecturer and their students. Also, regarding the literature review shown in chapter two and three, the researcher considered four factors represented the relationship to success the development in the e-learning as general. These four consideration factors could be drawn as Square or LS surface as following figure:

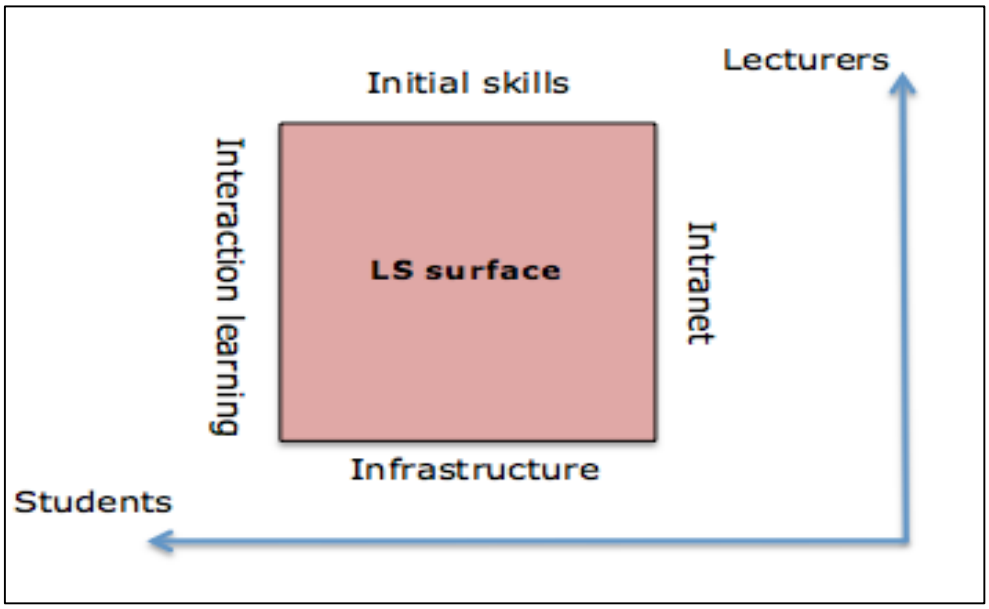


Figure 7.2: The relationship between the Lecturers and their Students

The four elements are: the intranet, the infrastructure, the interaction learning, and the initial skills. Each edge plays an important role in the success of e-leaning performance as following:

1. The intranet: This is the strength relationship between the Ls and their Ss via the ICT and the VLE tools and the blackboard that available for the Ls to help them to doing their work.

2. The infrastructure: This includes all required equipment tools, Labs, software packages, PCs, e-library, the room equipment tools such as the (Smart board, wireless internet, internet cable, etc.).

3. The interactive learning: This is the most important in this surface, from where many considerations and the most importance of it is the pedagogical constable. This edge has included the interaction services and facilities to easiness interaction between students, their colleagues and lecturers, students. The first point in that is the curriculum design, which needs many factors to be considered to be successful; such as the models, learning theories, institutional framework, level of achievement and the assessment strategy (Khan, 2005).

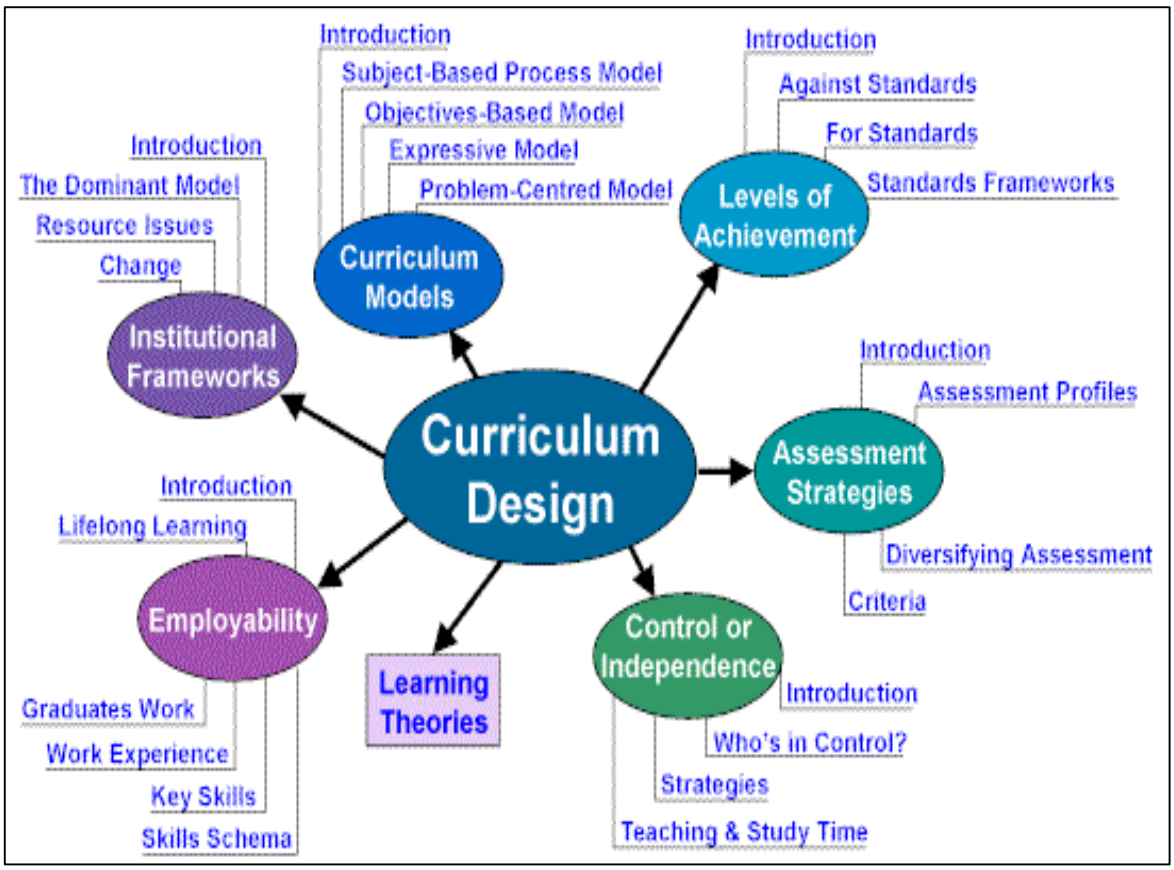


Figure 7.3: the curriculum design model (ASCD, 2012)

Therefore, the approach to curriculum development, should offered the principles as guide to course

planning, since 1990 Gordon Cawelt of The Association for Supervision and Curriculum Development (ASCD) has guide to the curriculum framework as following:

1. Offer a balanced core of learning in each course.
2. Adopt the belief that in-depth study of a limited number of important topics will have a more lasting effect than a course that tries to cover too many disconnected bits and pieces of information.
3. Design course outcomes to focus on results, with multiple indicators (assessments) of performance.
4. Design authentic assessments that will encourage originality, insightfulness, and problem-solving, along with master of important information.
5. Design courses to encourage active involvement.
6. Get students "doing" early in the course rather than studying all the principles and basics prior to performing.

However, regarding the assessments and the feedback, interactive learning should be reasonable and non-threatening feedback should be delivered to students regarding their performance and assignments in sensible time; module assignments that need students to engage in the analysis of the content. (IHEP, 2000). There are numbers from the assessment types, such as ongoing throughout the course, which may contribute to the grade of final assessment, encourage the student's motivation, short-term goals can be achieved and some students do not perform well in formal examinations. There are many methods of assessment that depend on the lecturers' thinking and their choice and the group of student was small or large; such as short answers, essays, practical work, workshop, tasks in the field, project reports, physical education activities, diverse evidence (witness statements, video, audio), reports of visits or industrial training, verbal reports of interviews, group activity assessment, workplace observations, quizzes, and progress charts (self-assessment).

From the point of view of Biggs (1999), who observed the pedagogical surfaces of learning and emphasised the three themes of learning:

-planning the learning outcomes;

-defining the learning theories (for curriculum development, teaching and learning processes, and assessment strategy);

-and studying the usability of the learning resources.

-Pedagogical design should ensure that the learning outcome contents, learning activities, teaching and learning processes, assessment methods and learning environments were effectively linked together, as shown in this figure.

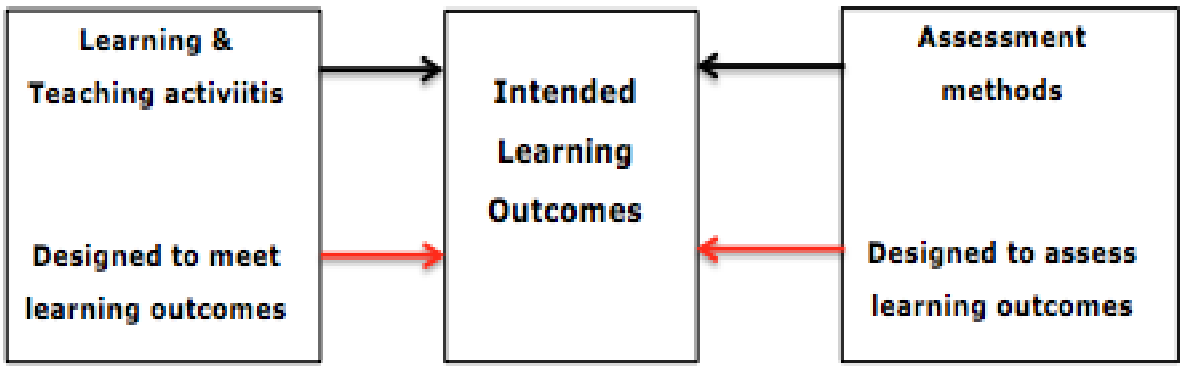


Figure 7.4: Supporting learning outcomes, teaching and learning, and assessment (Biggs, 1999)

4. The initial skills: These are the skills that are required and needed for the initial cooperation between the lecturers and their students in HEIs in general; as the email reply, preparing the lectures in the VLE, the online assessments, design the power-point sides, this skills should be subject to rules; whereas, it is depend on the initial training level that shall be subject to periodic evaluation or assessment benchmarks by specialists.

7.5 The relationship between the Technicians and the Students

This relationship is complementary, achieved and finished to the two previous relationships or the two surfaces that are the LS surface and the LT surface; this part will present the TS relationship or a surface from four edges. The researcher considered four factors that represented the relationship of success in the development of e-learning in general. These factors could be drawn as a square or the TS surface as following figure:

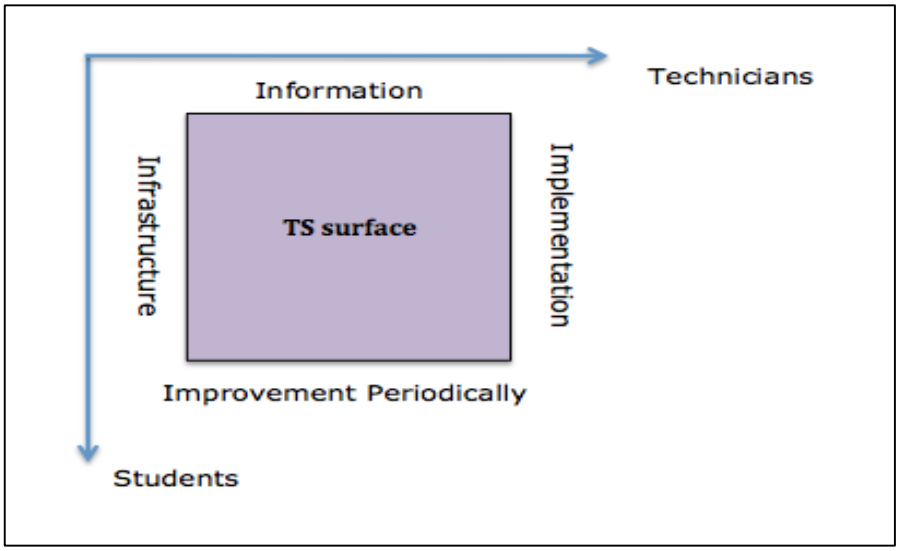


Figure 7.5: The relationship between the Technicians and the Students.

The four edges in this square are: information, the implementation, improvement periodically and infrastructure. There are two edges in the TS surface square as joint workers with the other surfaces (the information & infrastructure) and they play an important role in the success of e-leaning performance. These factors are details below:

1. The information: whereas these information have been previous preparing from the lecturers team and supported from the technicians team, which includes the curriculum details, course details, training courses, could be add some information related more by students such as registration rules, the help system, the support advice, etc.

2. The implementation: This is the light of e-learning performance that investigated the software related to the Blackboard or VLE of the school or the institute. This edge reflected the technicians' experience in teamwork and as initial skills as well as the management strategy according to the policies of the school or institute.

3. The improvement periodically: from the daily dealing among the students, emails, assessments, exams, help disk services, cooperation with the technicians and continues transaction in the midst T & S surface will create some notes, comments or challenges need a circle maintenance to improve performance. These improvements do not come without the T &S response notes; where there is a need for the technicians to act as a primary support.

4. The infrastructure: This edge is a joint side for the three relationships, it is including all required equipment tools, Labs, software packages, Pcs, e-library, the room equipment tools such as the (Smart board, wireless internet, etc.).

It could be collecting the three relationships of the LT surface & LS surface and the TS surface in one chap to design a cube, to added other three surfaces and three edges; each edge has represented an important element to success the e-learning strategy as following in the next section.

7.6 Proposed I-Cube model for the development of teaching and learning activities

To summarise, the three previous relationships were between the main groups of the stakeholders in the HEIs. Should find the joint elements or the same edges of the surfaces, the idea of each surface will be not completed without the others. Therefore, after collect the three surfaces both with explain every edge's work that were as following: information; Intranet; Internet; Individual Skills; Infrastructure; Interaction Learning; Initial Skills; Improvement Periodically; Implementation.

From the theories of the innovation and the internationalization which are have a great effective on the teaching and learning development process (see chapter 2 at pages 33-36) Also, the intelligent business

skills that should be included in the new strategy of the HE systems. These three elements are able to summarise the three squares or the relationships and linked them together to make the (I-cube) as following:

It is necessary to include other three edges as following: Intelligent business Skills; internationalization and the innovation. Figure 7.6 gives the collection of the three surfaces of the relationships with the new edges to make I-cube.

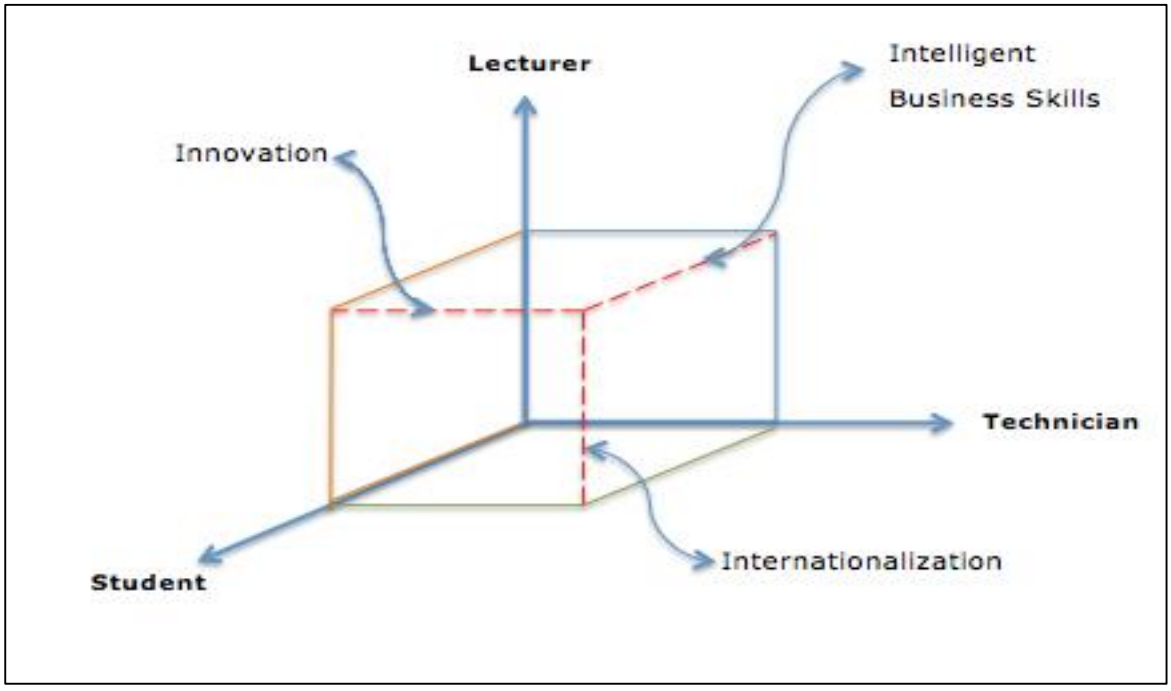


Figure 7.6: The proposed I-Cube model for the development of teaching and learning activities

The three new surfaces depend on the new edges of the (Innovation & Intelligent business Skills and Internationalization's curriculums) to make the I-cube.

1. The Innovation: This edge represents a suitable policy that should be applied by the administration team on the technician work and on the lecturer's activities and then find the reflections on students' performance; this innovation comes as a result of the SWOT circle in the school or institute and then a result of the decision makers.

The innovation process or procedure subject has too many roles and conditions to be successful (see chapter Two and the theory of innovation). Innovation of the e-learning is: moving at a fast pace especially with use of new tools, which encourage peer support learning and assessment. With an emphasis on exploring innovation, it is how discover the development in the educational communication and experience development it is including all the open education tools. It is the rethinking in the current method in the education.

Southern New Hampshire University in USA announced: "In 2019 most the colleges in US roughly half of all college classes of universities will be e-learning based" (innovation higher education news, 2015)

Innovation appearances at the use of innovative technologies and models to support e-learning, exploring

the impact of innovative tools and applications in learning and teaching. Dealing with pedagogical and technological issues with more flexible, whereas innovative technologies could involve to support learning, especially the wireless' use and mobile technologies such as games and simulation software, voting devices in classroom, multimedia, 3G phones and stronger wireless networks.

Since 2003, the UK had a collaborative projects involving institutions and industry will seek to determine where and how these technologies may be best deployed, and where interfaces need to be developed with standard institutional systems. Projects in three key themes of mobile and wireless technologies, physical learning space design and gaming are underway (JISC, 2003).

There are many new and old models that present the ideas and the stages of innovation. In this area of research it could be concluded that the facilities and services which should come from teaching and learning activities in the HEIs are as follows:

- The services of the consulting on the courses setup, prepare, design and how will be delivery.
- The courses revision
- The courses' development and support it with some programs.
- Design some activities to recognise the new method and keeping pace with the fasting global development in the HE.

In the LHEIs case should recognise the blended learning as soon as possible and creative a competition environment for the innovation and support it by annual assessment for all stakeholder team; to make responsible team to jab by quickly steps into forward.

2. The Intelligent Business Skills: These are the skills that are required and needed to come from the out the three initial elements of the HE team; not from the lecturers or students or technicians. It should be related by the decision makers and the responsible team or the government that related by the HE. This team should have good business, education and strategic experience to acquirement the required supports to the school or the institution.

In 2013 The Higher Education Funding Council for England (HEFCE) has published an Operating Framework setting out how the new and more market-based system of higher education in England created by the Coalition Government's reforms will be regulated; it accompanies a Ministerial Statement to Parliament (HEFCE, 2013).

Also, the University of Huddersfield, after including the "Enterprise and Entrepreneurship" has embedded an entrepreneurial outlook across research, teaching and collaboration to drive forward world-leading research with societal, economic and cultural impact. This work has been recognised as creating an environment which encourages research and collaboration.

The International Institute of Accelerator Applications, that is the first UK Institute dedicated to this key area of research. (Huddersfield University/ Business school, 2015)

In the case of Libya, if the intelligent business skills are successful, the LHEIs will become the highest investment institutions in the country, that back to many reasons and benefits; such as the strategic place of Libya in Africa (see figure 1.1 in chapter one) and how Attracting the African students and opposite the disadvantages of the illegal immigration to human investment advantages.
Also, to attract the Libyan migratory minds, it is maybe start from scratch, but start with strong base. The development in countries has measuring by the education and development it (Rees, 2002).
The intelligent Business skills as a big sea needs a good strategy to take the full benefits from every drop in it. In chapter 9 the full strategy to improve the e-learning performance in the Libyan HEIs.

3. The Internationalization: This is another important element in the I-cube model for the HEIs in general to acquire the international students and success the e-learning. This could be achieved via international agreement on the HE models' curriculum specification for all the courses to support the education process in the Libyan HE in all stages and in all LHEIs.
Internationalization needs many basics to become functional; (see chapter 2 and the internationalization framework). The British Council presented, through international Higher Education, many opportunities for success and other attempts to allow the courses to be close to average in level and the credits hours in the HEIs. (Bennett, 1968).

The internationalization needs to gain a substantial vision of the interactive learning methods locally as first stage and internationally as second stage; this vision should focus on the curriculum design, assessing achievements and how will be measuring the level of students, support learning (Petty, 2009A); measuring achievement, the feedback and how supporting student progress and then the annual evaluation for teachers and technicians (see chapter 8).

7.7 Chapter summary

This chapter has described the process of developing the proposed novel I-CUBE model which can be used for the development of teaching and learning activities in digital era. The researcher has done the qualitative analysis of the answers provided by lecturers, technicians and students to the open-ended questions included in questionnaires. There were some common opinions, which enabled to make correlations between the stakeholders' points of view and to construct the surfaces which have been included in the I-CUBE model. Also the conclusions presented in other chapters have been used to develop the proposed I-cube model as follows:

- Quantitative and qualitative analysis of the answers provided by lecturers, technicians and students to the questionnaires – see Chapter 5
- Conclusions for the SWOT analysis – see Chapter 6
- Study of the relevant publications – see Chapter 2

- Researcher's reflections of the design, development and implementation of the e-learning package- see Appendix F.
- Researcher's personal experience – as a lecturer at the School of Engineering at Tripoli University and as a PhD student in the School of Computing and Engineering at the University of Huddersfield, UK.

The researcher's imagination of this thesis created wide lines to build new model of a cube. Each edge in this cube gives important element to the success of e-learning strategy. This cube is called the I-cube because all elements begin with the letter "I" (see figure7.7). This is not a general solution which should be implemented in every HEI but is contains suggestions about the aspects which should be considered when improving the quality of teaching and learning processes in digital era.

I-Cube is considered the base or the cornerstone to create a suitable strategy to improve e-learning implementation; in particular in the Engineering school at Tripoli University and in general in the Libyan HEIs. It is a guide to provide the essentials to the development of e-learning. I-cube activities will be helping to make a good strategy to introduce the blended learning which is the base stage to success the e-learning in the future, after implementation the recommendations included in Chapter 8 (next chapter).

Next chapter presents a set from the important recommendations for the development of e-learning strategy in the School of Engineering at Tripoli University in Libya.

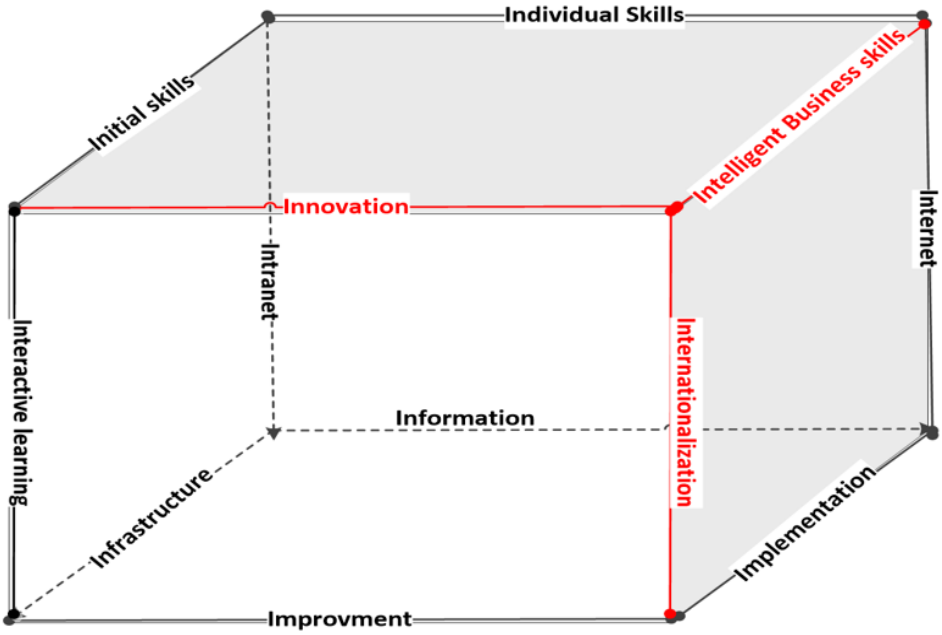


Figure 7.7: The final view of I-Cube.

Chapter 8: A set of recommendations for the development of e-learning strategy in the School of Engineering at Tripoli University in Libya

This chapter presents a set of recommendations for the development of e-learning strategy in the School of Engineering at Tripoli University. These have been derived from the analysis of barriers and SWOT model related to successful e-learning implementation in Libyan Higher Education. Also, the aspects included in the proposed novel I-Cube model for the development of teaching and learning activities, and the researcher's personal experience as a student and lecturer at Tripoli University and as a PhD student at the University of Huddersfield UK have been also taken into consideration.

8.1 The total quality management (TQM) for e-learning:

HEIs worldwide have seen an increase in the demand for using e-learning as a teaching and learning tool. The main strengths driving its popularity are:

-The surfacing of a worldwide communication network, with powerful computer technologies quickly transforming in all sectors, including the education system. Wild & Hope (2003) put forth the idea of e-learning as a solution to the cost and quality problems of universities.

-Reflective changes in work and lifestyle, which are necessitating a new concept of education for those who have irregular working schedules and both family and employment commitments (Coates, 2005 & McGorry, 2003).

-The HEI students are becoming more various and the demand for e-learning courses is increasing. The competition level is growing so that the HEIs are generally trying to distinguish their 'Virtual Learning Environment' by pervading quality into their e-learning contributions.

With increased usage of alternative teaching methods, e-learning could be changing the traditional understanding of educational activities. Therefore, effective service quality measures for e-learning became urgently required (WANG & Yang, 2003).

From a total quality management (TQM) approach, the upward students' satisfaction level and continuous improvement should be considered. The student satisfaction level in the classroom is a fundamental goal, which has provides great benefits to teaching. There are many studies related to the benefits of satisfaction level in the HEIs. Whereas, the satisfaction level has been related to student performance (Oliver, 1993 & Martilla & James, 1997 & Biggs, 1999 & Marks et al., 2005), retention, class attendance; also, student engagement (Coates, 2005 & O'Neill and Palmer, 2004).

Additionally, the satisfaction level is acutely important when considering e-learning environments, because if students are not satisfied with the online course experience, they could select out of e-learning courses or transfer to other institutions (O'Neill and Palmer, 2004). Student satisfaction level is regularly used to assess, measure and evaluate educational quality (Parasuraman, et al., 1985 & Nadiri et al., 2009).

Numerous models are available to assess the student satisfaction level, each with its advantages and disadvantages (Chang, et al., 2009). Though, the most persuasive disadvantage of those models is their powerlessness to deliver the priorities into improvement (Yang, 2003A & Wang, 2003). O'Neill and Palmer (2004) discuss that, whereas time is widely appropriated to discussing the psychometric performance of such tools, their real value to the higher education sector rests on their ability to pinpoint service failures and to direct constant quality improvement determinations that are of determined importance to students.

There are many methods for the total quality management for e-learning and there are many suitable models for the improvement of e-learning quality in LHEIs in general. The researcher of this study has depended on the barriers analysis and SWOT model to devise the (I-cube) that assists us in planning and evaluating the TQM of Engineering School at Tripoli University, because of the type of study depended on individual opinions and a culture that varies in its change resistance level.

8.1.1 The evaluation performance models and for measurement the quality in HEIs:

A challenge facing specialists in teaching is the relationship and implementation of the most suitable measurement tools to gain an enhanced understanding of the quality issues that impact upon the experiences of students (O'Neill & Palmer, 2004). With the absence of the objective measures, the HEIs' providers essentially reckon on the students' perceptions of quality to identify the strengths and weaknesses or SWOT model of educational programmes, and to conceive appropriate improvement strategies.

The HEIs have traditionally commissioned qualitative or quantitative methods to measure quality for students' perceptions (for example - interviews, focus groups, or observation research). Numerous models have been adapted in HE systems from quality improvement methods used in the industry: TQM (O'Neill & Palmer, 2004), Six Sigma (McGorry, 2003), ISO 9001 (Coates, 2005), Quality Function Deployment (Chao & Chen, 2009), the Malcolm Baldrige National Quality Award (MBNQA Model). Other techniques have been created such as the Student Satisfaction Questionnaire (Yang, 2003B), Student evaluation of teaching instruments (Oliver, 1993). Recently, the researchers and the academics have shifted their focus into customer satisfaction theories from the service marketing discipline (Hung et al., 2002).

The traditional questionnaires downgrade student satisfaction to a static outcome of a one-dimensional process whereas researchers and the decision-makers have a different perspective: satisfaction is a process in which student will experience a beginning expectations state and an ending performance state (Oliver, 1993). As a result of this dynamic nature of satisfaction, the most suitable technique for assessing student satisfaction is through an expectation disconfirmation process. The disconfirmation approaches have become famous in the education sector (Chao & Chen, 2009).

It must be kept in mind that the basic issue of improving service quality performance is in determining the priorities for critical service elements and drafting the improvement plan to effectively and efficiently enhance all the service quality levels (Hung et al., 2002). Despite the advantages of the I–S model, it is unable to suggest improvement priorities. To overcome this lack, this research proposes the use of an alternative model: the performance-evaluation model (Martínez-Caro, 2014).

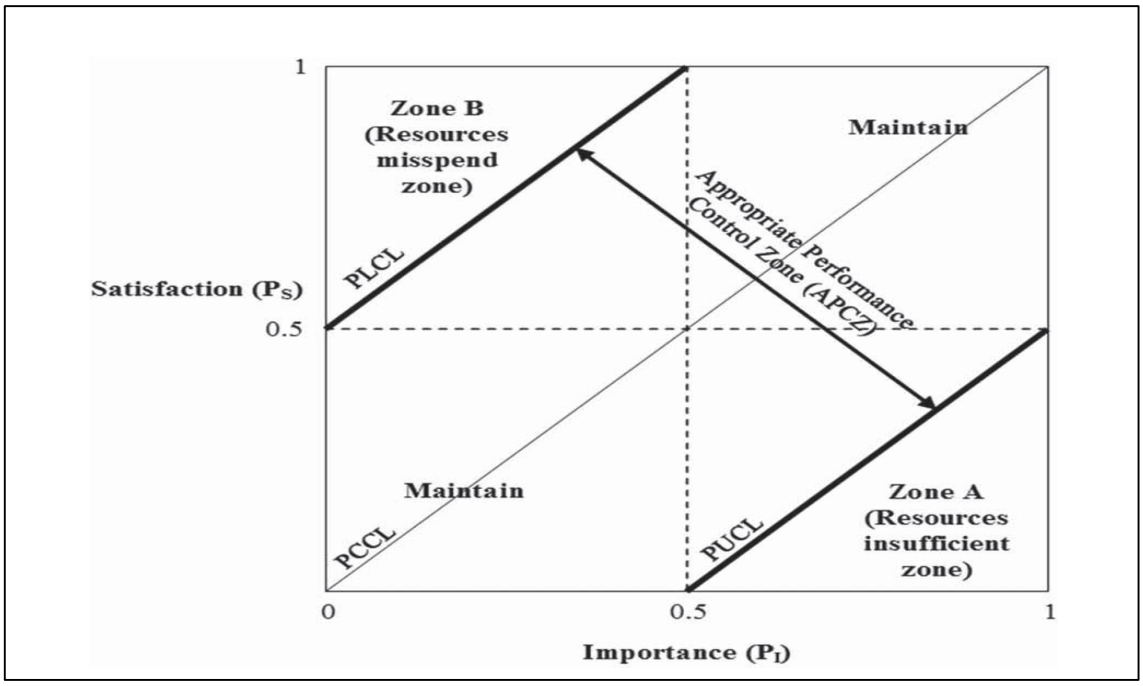


Figure 8.1: Performance-control zone of performance matrix. Source: Chen (2009).

Chao & Chen (2009) has suggested the I–S model, which is known as the performance-evaluation model. He considers in this model represented the performance matrix that is divided into three performance zones (See figure 8.1) that represent the effectiveness of various system-improvement items. Zone A is the insufficient resources zone. The quality aspects that fall into the Zone A have greater importance than satisfaction; therefore, more resources must be invested in these aspects to improve satisfaction. The second area in this model is Zone B, or the wasted resources zone. The quality aspects that fall into Zone B have less importance than satisfaction; therefore, the investment of resources in these items should be reduced to prevent waste. The third area is Zone APCZ, i.e. the Appropriate Performance Control Zone. The investment of resources in the quality aspects that fall into this zone must be preserved and continued. The three areas are limited by two lines, the performance upper control limit (PUCL) and the performance lower control limit (PLCL).

In the middle of the two lines, there is diagonal line representing the performance control centre limit (PCCL). These lines are established according to the coordinates that enable objective analysis and decision of the required improvements to be performed. The institutes should try to improve only those items that are located outside the control lines (Chen, 2009).

The PUCL and PLCL are defined as (+3σ) and (-3σ), respectively, with (σ) being the standard deviation of the performance control matrix.

This performance control matrix is stated in terms of a performance control matrix index (PCMI), which is defined as the index of satisfaction minus the index of importance. In turn, the indices of importance and of satisfaction are defined as follows:

$$P_{\mathrm{I}} = \frac{\mu_{\mathrm{I}} - \min}{R},$$

$$P_{\mathrm{S}} = \frac{\mu_{\mathrm{S}} - \min}{R},$$

Whereas, (PI) is the indicated to the importance, (PS) is the indicated to the satisfaction,
(μ_I) the mean of importance, (μ_s) the mean of satisfaction, min the minimum value of the k scale, and R the full range of the k scale.
Whereas the PCMI = P_s - P_I; If the PCMI has a positive value, this indicates that importance is less than satisfaction and that fewer resources should be invested to prevent waste. Conversely, if the PCMI has a negative value, this demonstrates that importance is greater than satisfaction and that more resources should be invested to improve satisfaction.
The beneficial contribution of (IS model) approach is that the larger the better model is adopted, in which a large loss function value indicates improvement priority. That is, a greater PCMI indicates that an item should be given priority with respect to improvement strategies.
This model will change the methods to measure the e-learning quality that is not focused completely on evaluating quality through selected aspects in terms of the students' satisfaction, without losing the aim of improving these aspects with the lowest levels of satisfaction. In addition, IS model active is a suitable tool for selecting quality items that most urgently require improvement to achieve student satisfaction in e-learning and for identifying items of extra resource investment, therefore, it will be helping to provide the means to minimise resource wastage. This model can be used in the future after the implementation on a larger scale more for e-learning systems in the School of Engineering at the University of Tripoli study and more studies are being completed regarding the importance and satisfaction levels of users.

8.1.2 Measurement of the quality management in the LHEIs:

Libya must match and compete with the standards of other countries' universities strategies. This goal is part of Libya's move towards a knowledgeable society for which ICT is considered a prerequisite to make decisions about technology issues before the implementation of practical e-learning systems aiming to reduce the investment of time, effort and money.
Libyan universities could benefit from combining the active learning methods with a suitable policy or accessibility into e-learning implementation (Elzawi, et al., 2013B). Both active learning and e-learning encourages students to use numerous sources of knowledge, and persuades them to integrate and employ information efficiently.

Satisfaction level with the available institutional technological infrastructure was very low among all the participating students; technicians and lecturers there; the quality of internet access was rated particularly low. This concurs with the findings of a study conducted by the engineering school at Tripoli University. The researcher found that the students did not respond favourably to e-learning courses, and perceived online learning as a more complex and difficult process than face-to-face learning. The latter suggested that the lack of adequate access to computer and internet facilities could have contributed in making

students less satisfied and enthusiastic about technologies.

The low level of satisfaction could be attributed to the considerable damage to the educational infrastructure caused by the 2011 armed conflict in Libya. In addition to the low levels of satisfaction with the quality of the available infrastructure, the quality of technical support was also found wanting, particularly by Libyan students of the capital in the engineering school at Tripoli university.

Even though the low level of satisfaction with the available technological infrastructure, an overwhelming majority of sample of the stakeholders from students, technicians and lecturers expressed their interest in studying and providing courses that use e-learning in the future. Elaborating on their willingness for e-learning provision, instructors identified as the main reasons e-learning's capacity to improve communication, to facilitate student learning, and to enable incorporation of new teaching methods.

8.2 Integration of the social media with e-learning in Higher Education

Many have noted the development of social media - especially Facebook, Twitter, YouTube and Wikipedia. Since 2006 when Time Magazine's 'Person of the Year' was declared, social media has come to control the ways in which digital technology is now used around the world (Adams, 2006). There are many distinct geographical and cultural variations within this global adoption where people in the USA may log on to Facebook and Twitter (Whinston, 2013), the Arabic users like to access Facebook and YouTube (reference), while Chinese users are more likely to access Renren and NetEase (Kaplan & Heanlein, 2010). All these applications show the principles of social media remain same, which rely on flexibly shared digital content that is authored, commented and reconfigured by a quantity of users.

Therefore, social media applications allow users to converse and interact with each other; to create, edit and share new forms of textual, visual and audio content; and to categorize, label and recommend existing forms of content. The key characteristic of all these social media practices is that of 'quantity socialization', attaching the power of the collective actions of online user communities rather than individual users (Shirky, 2008).

The younger generation students are accessing Facebook & Twitter and numerous other websites to connect and share with those around them. One of the most interesting things about social media is that users can interact and engage with each other solely through a Web presence, possibly never even meeting in person. They are share personal links to other sites or comment on others' posts, and students engage, stretching beyond social interaction purposes alone. Students use social media day in and day out to interact with their peers and even teachers about class-related subjects. In a world where online correlation is important for all the businesses, they are becoming experts at developing a sense of internet presence. It is not just that they know how to interact with others on the internet, they also know how to use basic and even complex functions in order to do so. These skills remain the same, which are not learned suddenly, as with any skill, social media prowess takes training. The younger generation has amazing potential. They approach professional challenges with zeal and excitement. With an understanding of the latest social media tools, many of younger generation are extremely talented in the

use the social media.

Social media poses plenty of opportunities for learning and teaching, and it is clear to see how students benefit from using social media. As younger generations use such technology in their classroom, they remake and change the educational landscape. The students, especially the younger generation, are facing the world through more than just books and assignments, they are learning to approach the world using a new formula of communication. Graduates are coming into the workplace with a lot to offer. The generation of those using social media share among themselves by giving and receiving information at rapid speeds. They share views and opinions, tips, comments and even the projects, which can be helpful information for classes. Their ability to assess, analyze, retain and share information help them to develop their skills.

8.2.1 Influence the social media usage in the university:

However, there is another argument relating to the influence of age on social media usage. There has been a study conducted by the University of Iowa in 2012 in the USA, where the young generation or those of the age 30+ who are largely behind the creation of these sites are better suited to fill the role of social media managers. The conclusion of study is that irrespective of age, the truth is some people have a better handle on social media than others. Age has not control at using social media professionally. It is the skills, clear strategies and the ability to execute (Sloane, 2012).

Social media becomes a growing occurrence with various definitions in HE and in all the academic use area. Social media in general refers to media that is used to allow social interaction. All the technologies of social media refers to use the applications that allow individuals and groups to engage, comment, create and share new users in digital environs through multi-way communication (the web-based and the mobile). In addition, social media has planning elements that create virtual social spaces encouraging interaction, thereby broadening the appeal of the technology and promoting transitions back and forth from the platform to face-to-face engagement.

There are many differences, the similarities and the likeness between the social media technologies; (Kaplan & Heanlein, 2010); Whinston (2013); it may be categorised into six groups, as follows:

Table 8.1: Cataloguing of social media

The social media group		**Example**
1.	Collaborative projects	Wikipedia
2.	Content communities	YouTube
3.	Virtual social worlds	Second Life
4.	Virtual game worlds	World of War craft
5.	Social networking sites	Facebook
6.	Social broadcasting technology	Twitter

8.2.2 The social networks worldwide and the active users

After the classifications, there are statistical numbers to the users and the accounts for the more famous as following in this figure as came in (Arab Social Media Report, 2014).

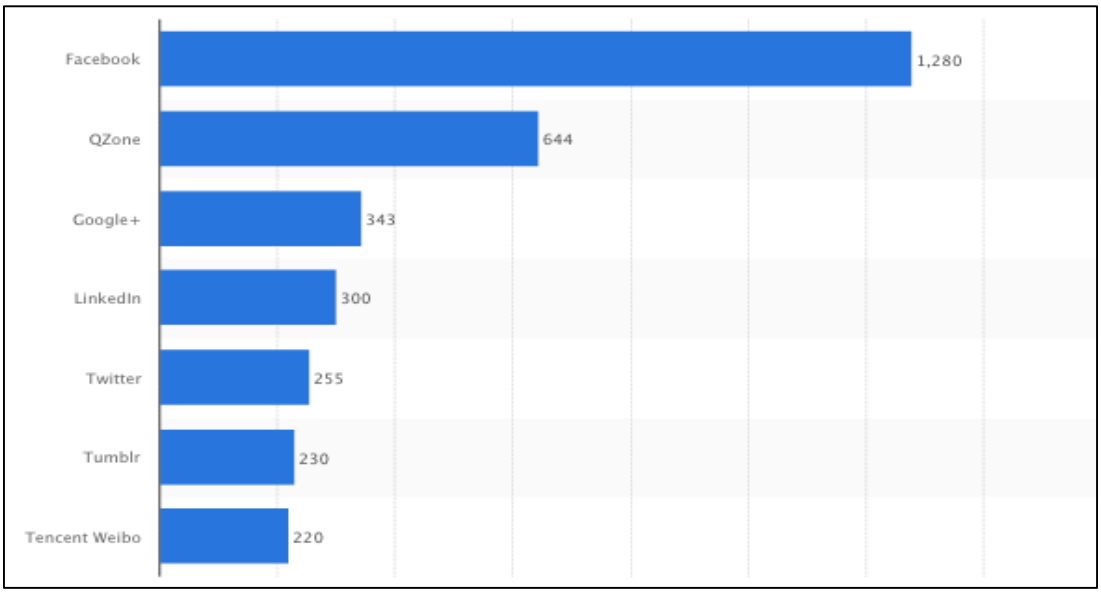


Figure 8.2: statistical numbers to the active users for the social networks of June 2014

This statistic offers information on the most popular networks worldwide as of June 2014, ranked by number of active accounts. Market leader Facebook was the first social network to transcend 1 billion registered accounts. Fifth-ranked micro-blogging network Twitter had about 255 million monthly active accounts. The order of the most prevalent social networking in the Dubai survey are as follows: "Facebook" ranked first among the most popular social networks in the Arab region, followed "Google Plus" and "Twitter." By given the particular on the numbers of the Facebook users in the Arabic area according to the report of Dubai School of Government in May 2013 as following in next figure; which is a report and according to it, the usage of Facebook topped the UAE, ranked first in the list of Arab countries, followed by Jordan, Tunisia and Libya. And still young generation who aged 13 and above years. In another survey conducted by the same college to study trends in the use of the internet in the Arab region shows that 72% of respondents receive their news from social media as the primary source of news while 28% preferred other traditional media sources.

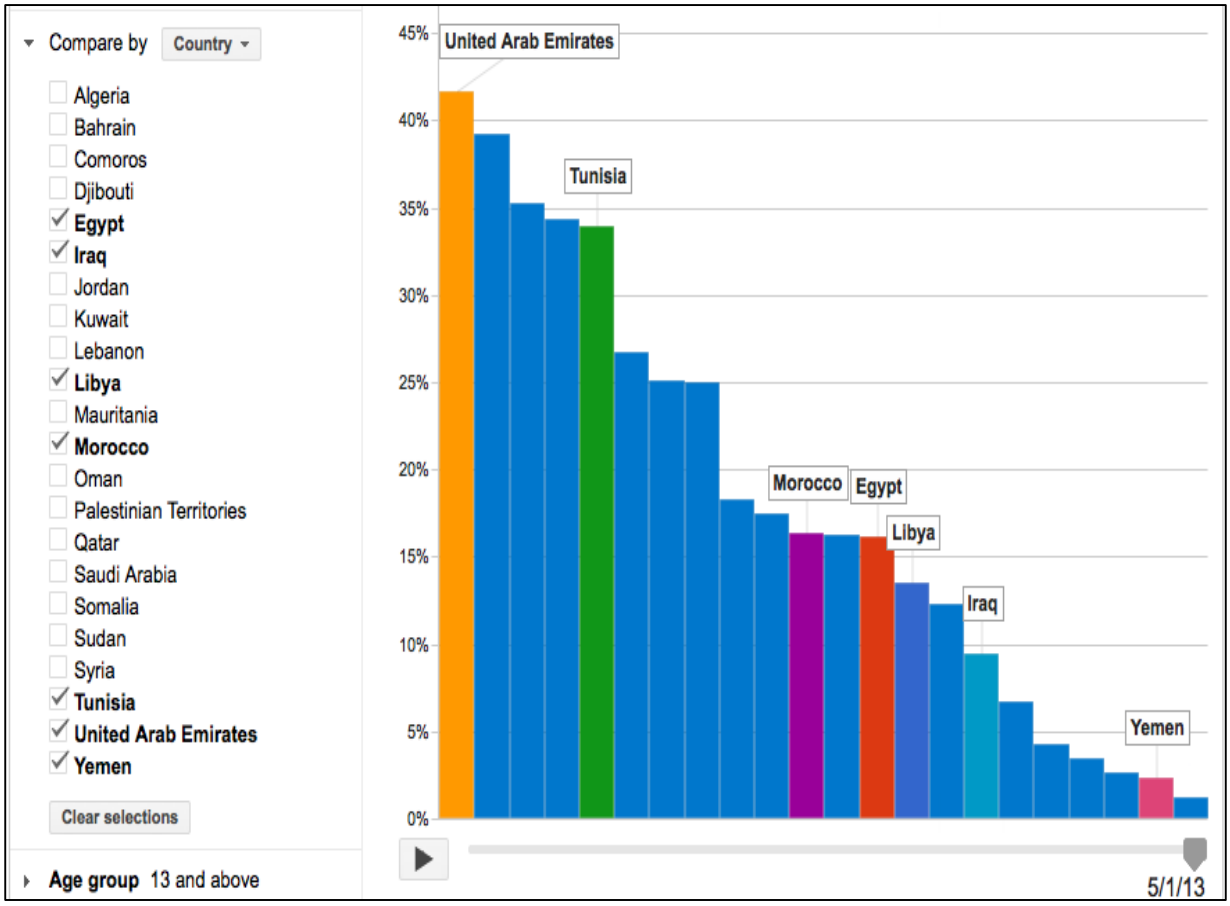


Figure 8.3: The numbers of the Facebook users in the Arabic area. (Arab Social Media Report, 2014).

8.3 Categories of recommendations to the stakeholders for the development of e-learning strategy at the School of Engineering at Tripoli University.

The strategy evolves during and after consultation through dialogues among government team, HEIs ministry and the administration teams, through conferences and formal responses. The strategy will enable us to exchange more information, ideas and evidence than are possible in a document. In this way, to build a new strategy for e-learning implementation in ES across all sectors and all stakeholders. The strategy document should be included: **institutional, pedagogical and technological recommendations.**

The analysis results of this research study indicate that most of the stakeholders, whether were (students; technicians or lecturers) they have good levels of use and skill in ICTs, they have positive attitudes towards e-learning, and are willing to engage in e-learning programmes. This holds promise for further integration of e-learning in most Libyan HEIs, they have recognised the benefits of e-learning.

This study offers evidence-based information that could be beneficial to be considered by administrators, policy-makers, and the academic staffs when implementing the new Libyan government's plans of advancing the integration of e-learning in the LHEIs. Based on the study findings, it is recommended that:

8.3.1 Institutional Recommendations – Strategic Actions:

These recommendations have been based on the consultation document produced by the Department of Education and Skills UK (2003) about the proposed e-learning strategy for the education e-learning system in the 21st century. These guidelines, which related to the UK educational system, could be extended to the Libyan HE because there is a delay in time between these two educational systems, so they are more relevant now.

1. To align assessment – traditional and online tests and exams.

Assessment is one of the greatest powerful drivers of innovation and change in HE, since it describes the goals for both; students, technicians and the lecturers. E-learning systems could greatly enhance the value of assessment through data analysis for the lecturers, and interactive feedback for the students with support the technicians (Biggs, 1999). Such systems can offer 'assessment for learning', and personalised support. E-learning could deliver the means to assess the new kinds of e-learning skills needed for life and work. The school of engineering needs to apply an assessment system for all the stakeholders' categories not just on the students.

E-learning assists in providing individualised feedback to progress the students' level (Shee & Wang, 2008). It also assists lecturers track students' achievement and review their teaching strategies. With adaptive formative assessment and diagnostic tools, students and lecturers have the opportunity to gain immediate feedback on progress, classify areas of weakness and thereby focus support. For lecturers, it has the potential to reduce time spent marking and increase time spent directing and supporting learning activities and improving the quality of their contact with their students. The School of Engineering should be encouraging the use of ICT in formative assessment for all academic years, and support action research pilots to test appropriate use of formative assessment, and re-improve the assessment techniques.

2. Assuring technical and quality standards

Without better analysis, it is difficult to determine both the goals and program effectiveness. This study discovered through the analysis results and many different references the quality assurance is still weak, while programs have been developed within some universities and programs, these efforts require substantially more resources than are currently being provided. Assessment techniques could also benefit from a review of best practices. Students and lecturers need to be confident that e-learning materials will work reliably and be forceful. Lecturers need to be able to find, access, create, use and adapt the resources they require to build lessons that will suit their teaching methods and the learning styles of their learners. The postgraduate students need to be able to study at home, in libraries, or in the workplace.

Frydenberg (2002) discussed the quality standards for e-learning in United States of America. These sets of standards could be considered to be representative for Libya nowadays, because there is a gap in the development of the two countries (USA is more advanced as a country).

a. Institutional (executive) commitment to the education and provision of learning (i.e. financial commitment, buildings, policies, technical support, legal compliance, etc.) – the School of Engineering at Tripoli University should devise new policies to support the development and implementation of e-learning.
b. Technological infrastructure - the development of reusable learning objects to create customized learning experiences for specific needs to be included in the courseware development. Better technical solutions to track student-learning performance refer to the learning management area. Young people are wirelessly attached to their PDAs, so it is necessary to produce lecture notes which can be compressed to smaller screens.
c. Student services – the implementation of e-learning systems in the School of Engineering at Tripoli University should consider access to supporting materials, support during the learning experience, and the continued connection between learners and the institution during and after the course has been finished.
d. Instructional design and course development – Five aspects of course design have been presented in a report from Pennsylvania State University (IDE, 1998): learning outcomes and course content; interactions; assessment and feedback; instructional media and tools; learner support. Design and development of e-learning should take into consideration that time, effort and money should be spent upfront to develop e-learning resources. Then, the learning has linear and non-linear aspects and occurs through discourse and interactivity. The decision makers from the School of engineering and Tripoli University should consider these aspects when they produce new e-learning policies.
e. Instruction and lecturer services – the policy makers from the School of Engineering and Tripoli University should keep in mind the differences between benchmarks of quality instruction in a face-to-face setting and e-learning environment. When the students attend lectures in the classroom several factors are important: lecturers' depth of knowledge, presentation and organizational skills, opportunities for student dialogue and synchronous feedback etc.). The students who access the e-learning materials off-campus are generally solitary and they rely deeply on electronic means of communication with the lecturer and other students (e-mails, online discussion group etc.). It is necessary for the institution to provide training courses so the lecturers feel comfortable using the modern technology. Technicians should be available to assist lecturers to resolve technical issues when the students are using the e-learning packages.
f. Program delivery – this refers to clear policies and procedures and fair and neutral management from the policy makers at the School of Engineering and Tripoli University. These policies ought to ensure academic honesty, content revision, and technical requirements for appropriate access to e-learning systems so the course delivery and administration could become transparent to students.
g. Financial health - responsible business planning of face-to-face sessions and e-learning programs should be included in the evaluation standards. The hybrid model of combining licensed learning objects with university-developed specialty content could be easily adopted by the Tripoli University because the lecturers are more resistant to fully develop the lecture notes due to fear of losing the intellectual property rights over their course notes. However, they will feel more confident if they have the chance to apply innovative ideas related to pedagogical and scientific content and use licensed commercial packages for the production of course notes.

h. Legal and regulatory requirements - The Tripoli University should have clear rules and policies regarding copyright and intellectual property and generic contracts for the licensing of course materials.

i. Program evaluation - The policies from the School of Engineering and Tripoli University should contain benchmarks regarding matching student learning with intended learning outcomes, student and staff satisfaction, the extent to which libraries are used appropriately by the students when they are accessing e-learning materials.

There are many technical standards for e-learning in various countries. Marshall (2004) produced a list of technology (see Table 8.2), interoperability and resource discovery standards and standards like efforts of a large number of people and organisations.

Table 8.2: List of technical standards for e-learning worldwide (Marshall, 2004)

Metadata/Resource Discovery	
ARIADNE Educational Metadata Recommendation	http://www.ariadne-eu.org/en/publications/metadata/index.html
Dublin Core Metadata Element Set	http://dublincore.org/documents/dces/
Canadian Core Learning Resource Metadata Application Profile	http://www.cancore.ca/documents.html
EdNA Metadata Standard	http://www.edna.edu.au/metadata/
Gateway to Educational Materials Element Set	http://www.geminfo.org/Workbench/Metadata/index.html
IEEE 1484.12.1-2002 Learning Object Metadata standard	http://ltsc.ieee.org/wg12/
IMS Learning Resource Meta-data Specification	http://www.imsproject.org/metadata/index.cfm
Le@rning Federation Metadata Application Profile	http://www.thelearningfederation.edu.au/repo/cms2/tlf/published/8519/Metadata_Application_Profile_1_3.pdf
Microsoft LRN	http://www.microsoft.com/elearn/support.asp
SingCore	http://www.ecc.org.sg/cocoon/ecc/website/standards/singcore.standards
UK LOM Core	http://www.cetis.ac.uk/profiles/uklomcore
Knowledge/Content Mangement	
The Digital Object Identifier	http://www.doi.org/
IEEE P1484.11 Computer Managed Instruction	http://ltsc.ieee.org/wg11/index.html
IMS Content Packaging Specification	http://www.imsproject.org/content/packaging/index.cfm
IMS Simple Sequencing Specification	http://www.imsproject.org/simplesequencing/index.cfm
IMS Learning Design specification	http://www.imsglobal.org/learningdesign/
Learning Material Markup Language	http://www.lmml.de/
PALO	http://sensei.lsi.uned.es/palo/
ADL SCORM Content Aggregation Model	http://www.adlnet.org/index.cfm?fuseaction=scormabt
Interoperability	
ADL SCORM	http://www.adlnet.org/index.cfm?fuseaction=scormabt
AICC CMI Guidelines for Interoperability	http://www.aicc.org/docs/tech/cmi001v3-5.pdf
IMS Resource List Interoperability Specification	http://www.imsglobal.org/rli/index.cfm
IMS Enterprise Information Model	http://www.imsglobal.org/enterprise/index.cfm
IMS Enterprise Services Specification	http://www.imsproject.org/es/index.cfm
IMS Question & Test Interoperability Specification	http://www.imsglobal.org/question/index.cfm
IMS Shareable State Persistence Specification	http://www.imsglobal.org/ssp/index.cfm
IMS Digital Repositories	http://www.imsglobal.org/digitalrepositories/
IMS Learner Information Package Specification	http://www.imsglobal.org/profiles/index.cfm
Internet2 Shibboleth	http://shibboleth.internet2.edu/
ISO/IEC JTC1 SC36/WG3 Learner Information	http://participant-info.jtc1sc36.org/
OASIS Security Assertion Markup Language	http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=security
School's Interoperability Framework	http://www.sifinfo.org/index.asp
Accessibility	
IMS AccessForAll Meta-data Specification	http://www.imsglobal.org/accessibility/index.cfm
Le@rning Federation Accessibility Specification	http://www.thelearningfederation.edu.au/repo/cms2/tlf/published/8519/Accessibility_Specification_V2_0.pdf
Web Content Accessibility Guidelines	http://www.w3.org/TR/WAI-WEBCONTENT/
Intellectual Property and Digital Rights Management	
ISO/IEC JTC1 SC36/WG4 Digital Rights Expression Language	http://ltsc.ieee.org/wg4/index.html
Le@rning Federation Rights Management Specification	http://www.thelearningfederation.edu.au/repo/cms2/tlf/published/8519/docs/rights_management_specification_v1_2.pdf
Open Digital Rights Language	http://www.odrl.net/
Quality/Pedagogy	
Le@rning Federation Educational Soundness Specification	http://www.thelearningfederation.edu.au/repo/cms2/tlf/published/8519/docs/educational_soundness_specification_v2_2.pdf

The policy makers from the School of Engineering and Tripoli University could consider these standards when developing the rules and policies for e-learning in their institution, especially since they refer to developed countries such as Australia, New Zealand, USA, UK, etc.

3. Supporting innovation in teaching and learning

E-learning offers a wide range of pedagogues, teaching and learning practices, but the lecturers have had little opportunity to engage in its development. The institution and the administration team must create the conditions that allow the teaching profession to take more responsibility for the way teaching and learning is carried out, rather than being tied by the physical constraints of the classroom, the book and the timetable. E-learning should enable students and lecturers to be innovators in the teaching of their subject.

The policy makers at the School of Engineering from Tripoli University should aim to develop the policies enabling the development and implementation of practical and original solutions to enhance the learning experience of staff and students. A good example is the e-learning and Pedagogical Innovation Strategic Framework for University of Leicester, UK (see Figure 8.4).

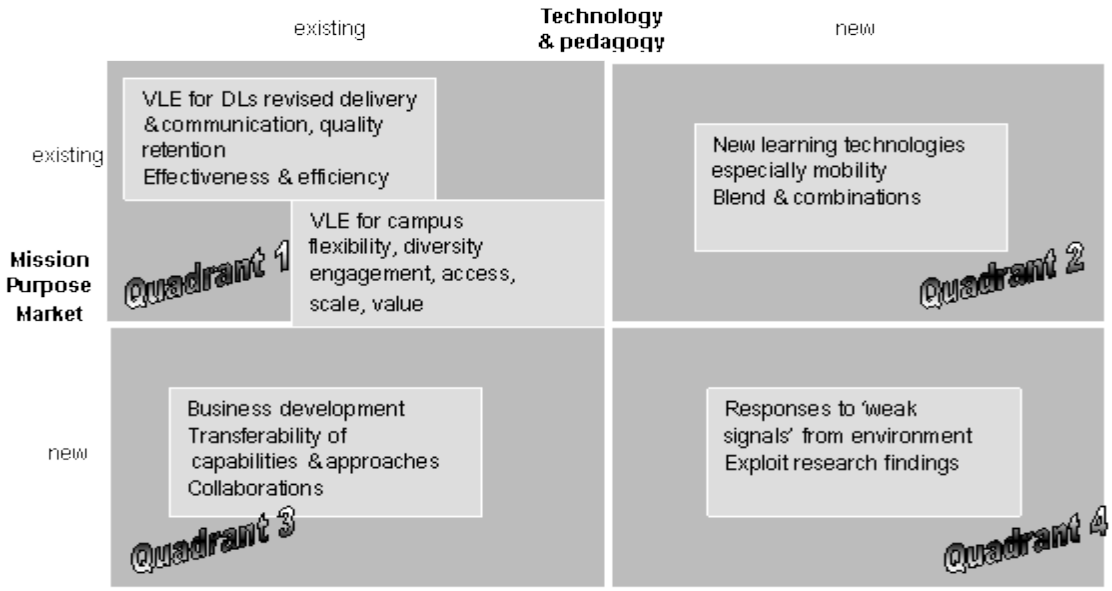


Figure 8.4: The E-learning & Pedagogical Innovation Strategic Framework for University of Leicester.

Quadrant 1 (time scale – immediate and ongoing) – refers to the extension of use for existing technological products and Blackboard into teaching and learning processes in order to increase the quality of these processes. Some key actions could be considered as follows:

-Pedagogy needs to be revised in order to allow for better delivery and accessibility by diverse student groups to resources.

-Produce studies regarding the relation between e-learning and traditional forms of learning and teaching.
-Use e-learning to increase quality of students' experience for students so they have flexible access to resources and could engage more in the learning processes.

Quadrant 2 (time scale – medium) – this concentrates on the available learning and mobile technologies and their potential teaching applications for on-campus and off-campus access.

Some key actions could be considered as follows:

-Support students and staff to use modern technologies for learning and communication purposes.
-Study the value of using modern technologies for students and staff access and achievement.

Quadrant 3 (time scale – immediate and ongoing) - organising the existing technologies; address different and new markets; promote business development and solve problems.

Some key actions could be considered as follows:

-Focus on transfer of learning and technology applications from one department to another
-Collaborate through e-learning with partners and collaborators

Quadrant 4 (time scale - medium to long) – this represents a more radical view of change using technologies and power behind the e-learning movement and recognising the potential to put University of Tripoli on the global e-map. Some key actions could be considered as follows:

-Incorporate research understanding from e-learning and innovative pedagogy in planning and budgeting processes.
-Investigate the links between the advantages of using modern learning technologies and the practical requirements for their employment (such as infrastructure quality, internet access, etc.)

4. <u>The training courses and developing the education workforce:</u>

The whole of the education and training workforce must be fully engaged in order to lead change and deliver effective e-learning. This means high-quality initial training and professional development opportunities should be offered to anyone involved in the design, development, and implementation of e-learning solutions at the School of Engineering and in Tripoli University (such as lecturers, technicians, tutors, teaching assistants, learning support assistants, support staff, mentors, trainers, students, all professionals and voluntary workers coming into contact with the students). Initial training and professional development providers will need to respond by confirming that courses include the knowledge and skills needed.

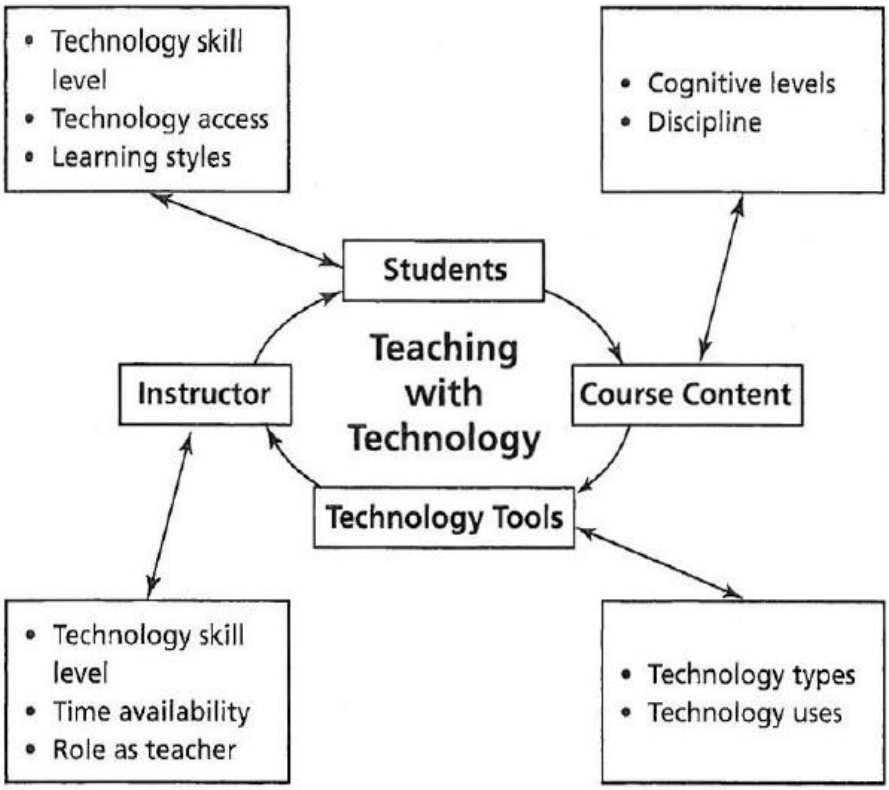


Figure 8.5: Aspects related to teaching with technology (Svinicki and McKeachie, 2014)

Considering the aspects related to teaching with technology (see Figure 8.5), possible topics for training courses could be: innovative instructional design methods, enabling better interactions with the e-learning package and between users, combining the use of e-learning packages with face-to-face sessions in the blended learning approach, determining criteria and standards for traditional assessment and computer-based tests, etc.

5. Unifying learner support – collaboration between lecturers, technicians and employers

To offer student's advice and guidance in a supportive environment that provides a seamless transition between school, work-based learning, university and lifelong learning. Educational organisations, agencies and services (see Figure 8.6) will need to focus on linking with each other to meet personal learning needs at every stage e-learning and e-delivery have the potential to offer complete and personalised support for students' needs throughout the learning process, from information, advice and diagnostics through to an electronic learning log at the completion of a course. The institutional rule for the **School** of the **Engineering** should be linked to management information systems so they can also support the relationship between the students, lecturers and educational institution in all aspects of administration. A unified approach is particularly beneficial for students with special educational needs. Transitions impact all students at every stage of their education, at college or university. Supporting and enabling progression is important, particularly for disabled learners and those with learning difficulties, where continuity in meeting their individual needs appropriately is essential.

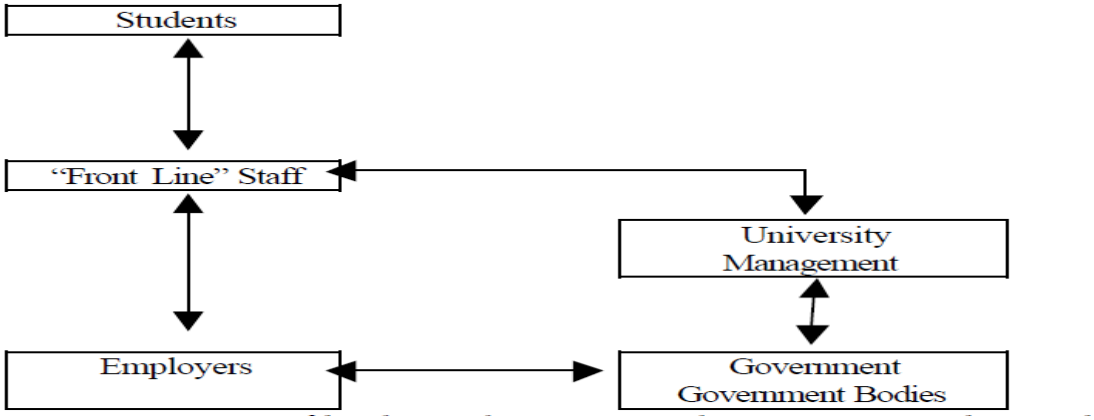


Figure 8.6: Relationships between customers of Higher Education (Hewitt and Clayton, 1999)

The current social, economical, political conditions in Libya have been influenced by the war, so even the HEIs have been badly affected. The required changes in the policy system for HEIs should encourage the dedication and strong motivation of employees to attend internal and external training courses so the software and hardware packages and the relevant ICT support can be updated continuously (Kenan, et al., 2013C). To be successful, e-learning should have the affirmative support of senior management and a fixed budget that has been set aside to maintain and develop the facilities.

The Libyan students in HEIs have different educational experiences based on the geographic location of their colleges and universities: the students from rich areas (such as Tripoli Town Centre) have access to the latest state-of-the-art technology (Kenan, et al., 2015) while the students from areas such as Al-Koofra city have third world experiences and never saw or used a computer until they reach HE. Therefore, the mindsets and the attitudes towards learning of such diverse learners should be taken into consideration.

The Libyan government should give more support to the HEIs that have demonstrated success in the implementation and management of e-learning, so these institutions will feel encouraged sharing their success with other institutions. More coordination and resource sharing between different HEIs could be of general benefit. Government departments of Higher Education Ministry have all responsibility to sponsor development of technologies in LHEIs that will produce a workforce that is competent in technologies

8.3.2 ***Pedagogical Recommendations – Strategic Actions:***

These recommendations have been based on the report produced by the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA, 2005) regarding to 'Pedagogy strategy for learning in an online world' for Australia and New Zeeland. These guidelines (which have been related to the above mentioned countries) could be extended to the Libyan HE because these countries are more advanced in pedagogical research and applications.

6. Learner focus considering the changes in the student culture:

Rhema (2013) underlined the lack of student accountability in Libyan HEIs because there are weak incentives to achieve good academic results in the educational process and no penalty for assessment failure. If the student fails then it will be blamed on the lecturers. The government-provided living stipends for students and nearly unlimited opportunities to retry following failure have only exacerbated these problems. Figure 8.7 presents the inputs, outputs and the teaching process in HEIs which is very common in Libya. The lecturers determine precisely the aims, content, organization, and speed of sessions by providing the information and knowledge. The students have a passive role and they have to spend a lot of unguided study time outside the classroom in order to achieve long-term retention of course material.

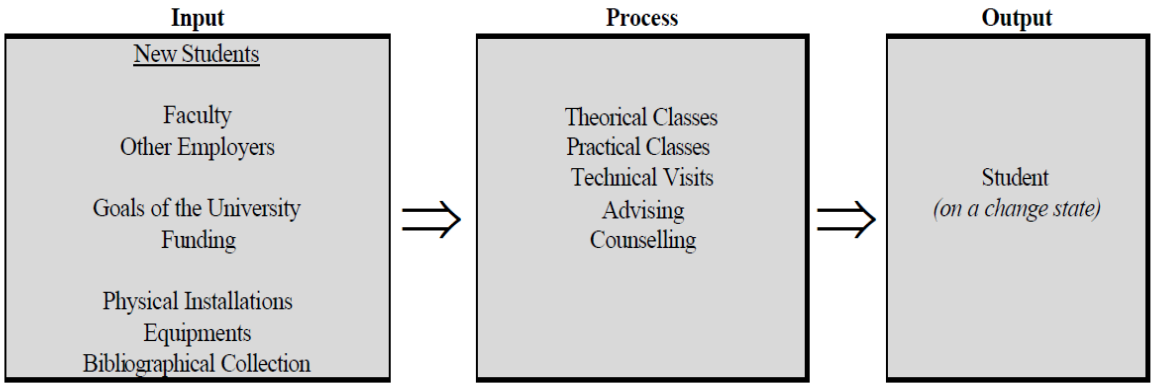


Figure 8.7: Description of the teaching process in Higher Education (Pereira and da Silva, 2003)

The High Level Group on the Modernisation of Higher Education (HLGMHE, 2013) produced a report to the European Commission on improving the quality of teaching and learning in Europe's higher education institutions. The group members emphasized that:

"Teaching and learning in higher education is a shared process, with responsibilities on both student and teacher to contribute to their success. Within this shared process, higher education must engage students in questioning their preconceived ideas and their models of how the world works, so that they can reach a higher level of understanding." (HLGMHE, 2013, pp.18)

It is therefore obvious that a better collaboration between lecturers and students (see Figure 8.8) is necessary to give them shared responsibilities during the learning processes. This model has been used mainly in business applications, but could potentially be applied for learning purposes.

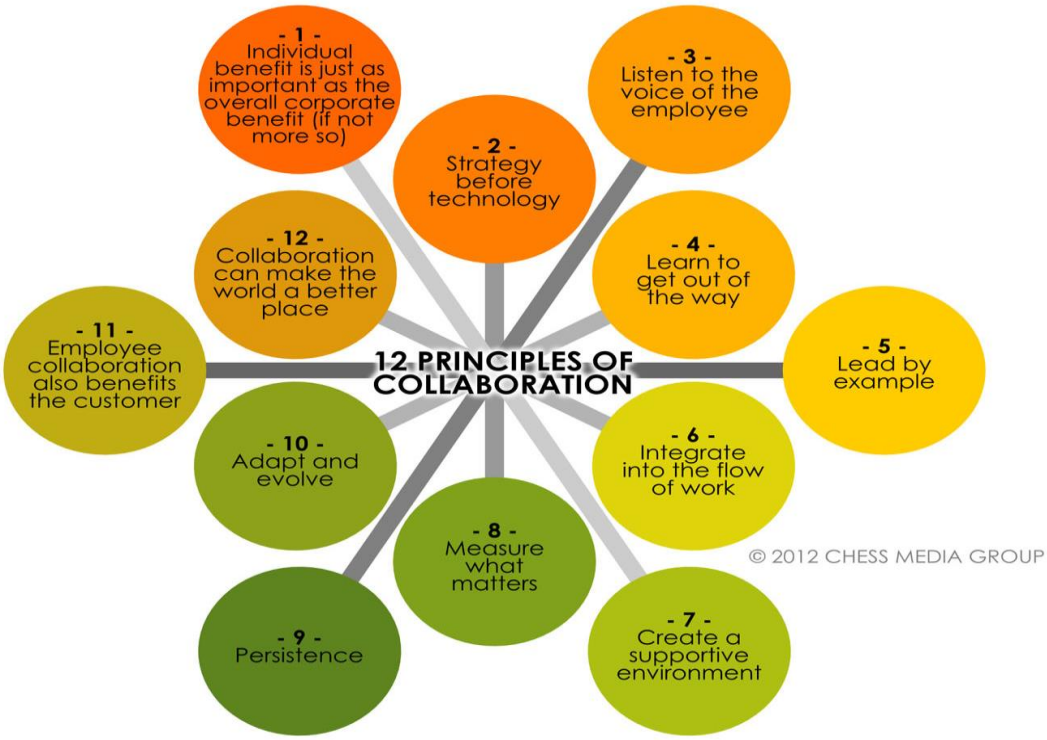


Figure 8.8: Principles of collaboration (TeachThought, 2015)

Figure 8.9 presents the inputs, outputs and the learning process in HEIs, where the students play an active role by solving the homework, reflections of their learning, etc.

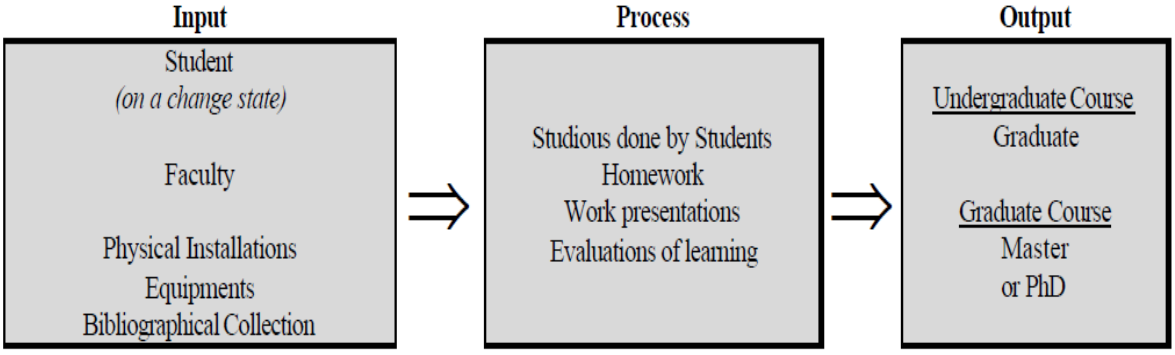


Figure 8.9: Description of the process in Higher Education (Pereira and da Silva, 2003)

Therefore, some policies for the School of Engineering and Tripoli University should be formulated so the lecturers can become more empowered to focus on student-centred, active and interactive learning; connect with learner expectations, experiences and needs; provide opportunities for students to create, construct and communicate knowledge and develop critical and ethical understandings of the value of the use of ICT.

7. Educational Soundness

The lecturers in the School of Engineering at Tripoli University could use the five stage model of e-learning presented by Salmon (2004) and other learning theories such as Bloom taxonomy (see chapter 2) to ensure that the use of ICT adds value to the intended learning. The policies should enable the students to use technology in order to solve problems, analyse and exchange information and develop ideas though discussion forums and emails.

Another key action is to apply the scaffolding of learning using appropriate technologies and content because “can potentially lead to improved academic achievement” (Murtagh and Webster, 2010). More studies should be conducted to evaluate the effectiveness of the use of ICT in the design of learning programs before more key actions can be included in the e-learning strategy.

8. Professional Learning

This is the collaborative between the academic staff in experiences’ exchanging. The academic staff in general in the Engineering school should join with the other colleagues and share in professional learning programs and understand the possibilities of ICT different applications in teaching. Also it is necessary to collaborate with the management and administration team to make time management and save their times into apply other pedagogies technics and training courses as much as possible. Furthermore, they should create and share online learning resources from the e-libraries to support their curriculums and syllabuses, and develop it.

9. Alignment

It is necessary to enable the development of teachers' communication skills and cultural awareness so they are better prepared to work with culturally diverse students by considering interrelated economic, political, and educational aspects of the students’ lives, background and aspirations (see Figure 8.10).

The size and region of the community combines with family characteristics and processes to impact teacher and student characteristics. School and state policies combine with teacher and student characteristics to impact teacher behavior, while student characteristics and teacher behavior influences student behavior. Student classroom behavior then influences teacher classroom behavior in an interactive pattern that eventually results in student achievement as measured by instruments influenced by state policies. Student achievement at the end of one school year then becomes a student characteristic at the beginning of the next.

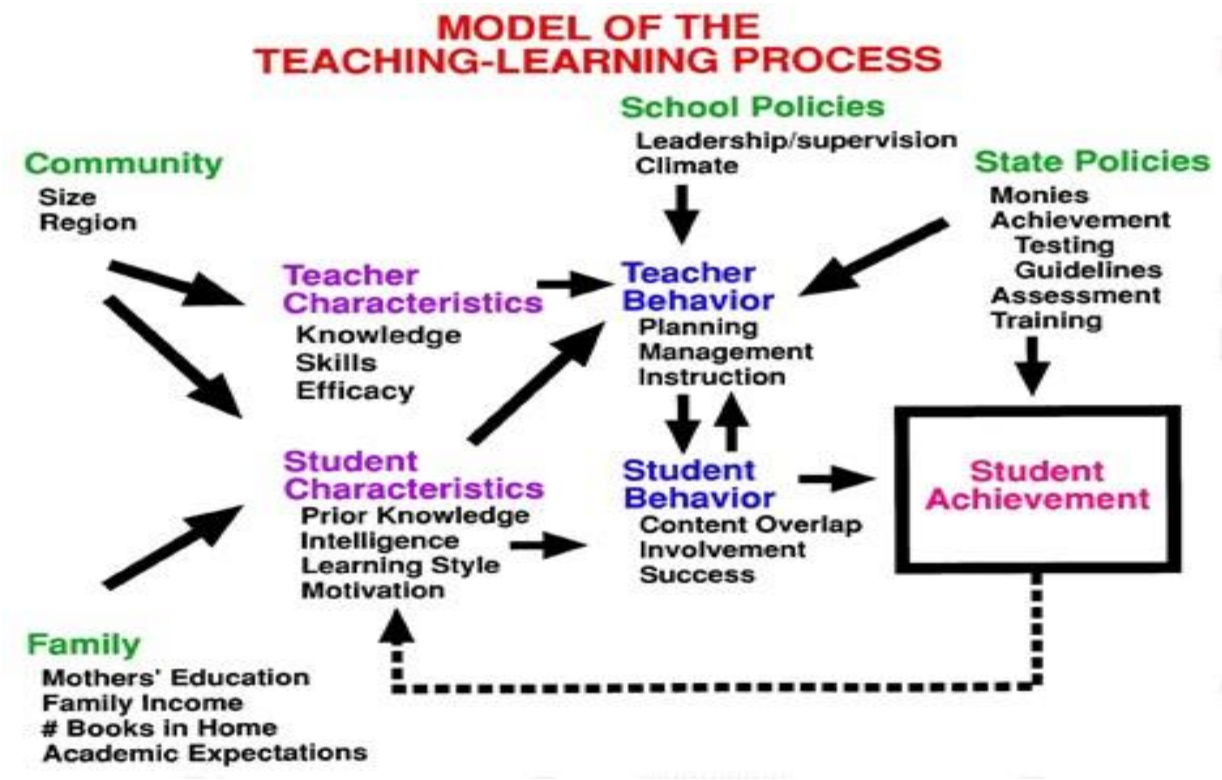


Figure 8.10: Factors affecting the student achievement (McIlrath and Huitt, 1995)

It will be beneficial for the staff from School of Engineering to share information and best practice with other schools from Tripoli University, other Libyan HEIs and community.

10. Collaborations

The policies from the School of Engineering and Tripoli University should provide opportunities for students and staff to collaborate with the industry and community because they are customers for Higher Education (see Figure 8.11).

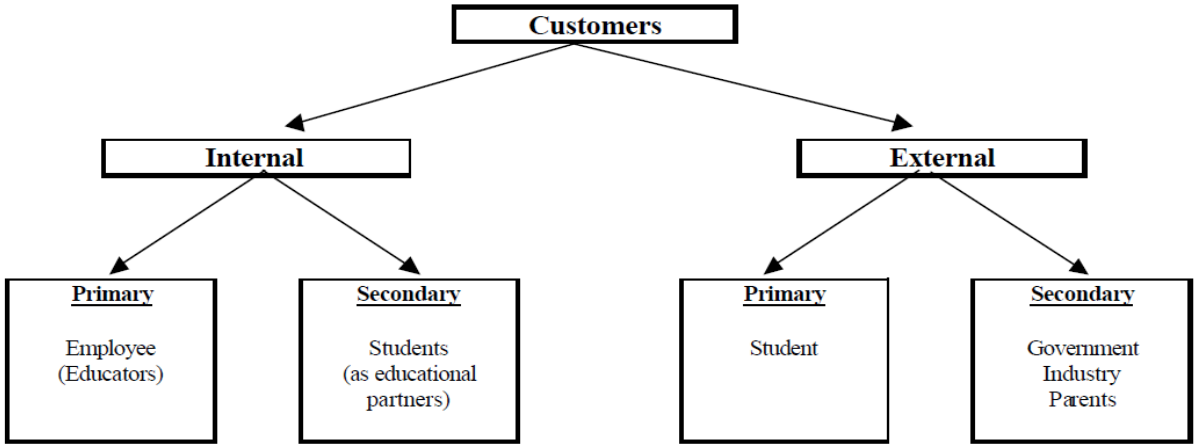


Figure 8.11: Customers for Higher Education (Kanji and Tambi, 1999)

Also, the students should be more involved in the process of incorporating new technologies to support their learning by answering questionnaires related to the development and implementation of e-learning packages, giving feedback and expressing their views about modern technologies and possible educational applications.

The University of Tripoli should focus on collaboration with other Libyan HEIs and neighbouring Arab countries experience in e-learning implementation, and a wider international community, to draw upon their e-learning experience and expertise to facilitate and accelerate the advancement of e-learning in Libyan HEIs. All should invest in e-learning and look into attracting students from others countries (see the internationalization in I-cube part in chapter 7).

The lecturers are best placed to recognise, understand and discover how to use e-learning in their field, though on the other hand they need the tools and the means to discover and innovate. At present, the lecturers in Engineering School should not focus on design tools, but on learning content, teaching materials, and resources. Engaging teachers and lecturers through simple e-learning design tools would bring them closer to experimenting with pedagogical design. Development of local e-learning content should be encouraged with a view to generating materials that are culturally appropriate and accessible to most Libyan students, especially if it available in an Arabic version. Improved availability of suitable Arabic resources would engage a wider population of students and instructors in e-learning. The ability to create such content would also improve Libya's standing as a provider of e-learning in general.

11. Include the intelligent business skills in the design and development of curriculum

Presently, universities worldwide have to resolve simultaneous contradictory demands, such as reduced government support, increasing public disbelief regarding the value of a degree, amplified institutional competition and the development of disruptive technology. So it is essential for the university graduates to be equipped with the employability skills which will contribute to their success in their personal and professional lives.

The Scottish Government published a report on 2009 regarding the clusters of skills for learning, life and work: literacy; numeracy; thinking skills; health and wellbeing; personal learning, planning and career management; working with others; leadership; enterprise (see Figure 8.12). The development of employability "is essential to learning and education to help young people to become successful learners, confident individuals, responsible citizens and effective contributors" (Scottish Government, 2009, pp 7).

The requirements for these generic skills can be expanded to other countries (including Libya) because they will enable the university graduates to prosper in a modern society and economy laying the foundation for the development of lifelong learning skills. The enterprise (intelligent business) skills will ensure that the students will be ready for the world of work in general, rather than for a specific occupation, and ensure they are exchangeable to a variety of contexts. The graduates should be able to influence and negotiate with others, evaluate risks about individual and collective decision making, take the initiative, show resilience and willpower to prosper.

The educational managers from the School of Engineering and Tripoli University should encourage the academic staff to design and develop curriculum, which includes enterprise and sustainable development (environmental and community) activities, health promoting activities, community sports and leisure activities and work placements.

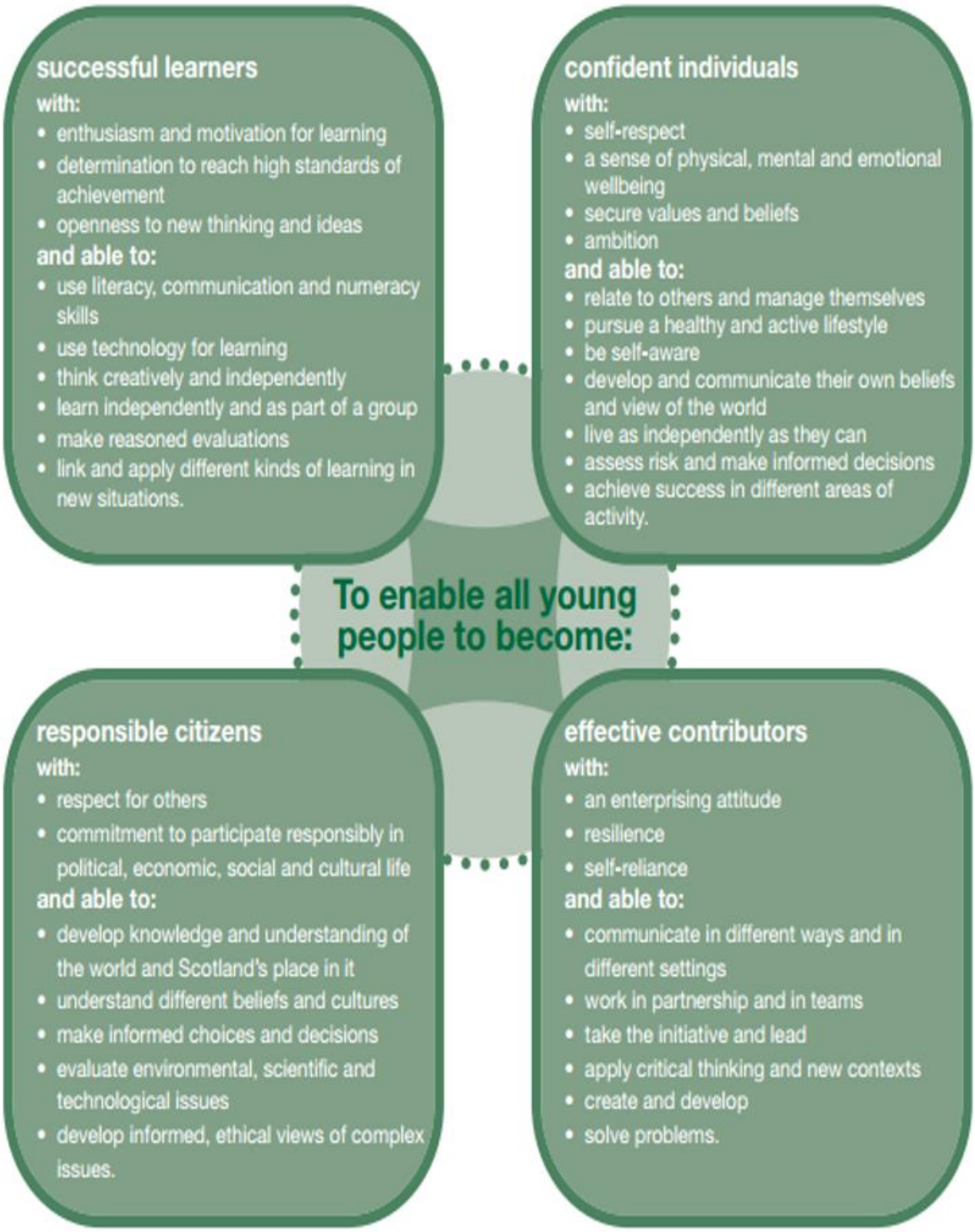


Figure 8.12: Curriculum for excellence (Scottish Government, 2009)

12. Diversity and removing barriers to learning

Due to the individual support that an adaptive e-learning program can offer, it makes the most impact on those learners who have difficulty accessing education. This includes adult women learners (Housewives) with mobility difficulties who can overcome isolation through online environments, pupils who cannot attend school but can access online materials and support, and many others. The current strategies for improving support for disadvantaged students could exploit e-learning even further. E-learning has been shown to make a significant difference to these students, sometimes bringing them in from the margins to full participation.

E-learning makes a vital contribution to widening access to education and preventing discrimination against disabled learners. Developments targeted on disabled or disaffected learners invariably offer significant benefits to all other learners as well. Audio versions of materials for learners with visual impairments provide greater choice in mode of study for sighted students. Simpler interfaces for physically disabled learners are easier for others to use as well. One proposal, therefore, is to target funding on those who are experiencing barriers to learning and participation, with the expectation of delivering significant educational benefits for all.

Student-centered learning is both a mind-set and culture within higher education institutions. Years of research on the learning process have shown us that the transmission of knowledge from teachers to learners is less effective than an approach to teaching and learning that involves students directly in the production of knowledge, and transforms students' perceptions and understandings by empowering them to apply knowledge in their own contexts.

It is essential to develop innovative methods of, and excellence in teaching, and to take students seriously by providing them with as much choice as possible, from assessment methods to course literature and study courses in general. Inclusion of students in the academic community must also be supported by building relationships between academic staff and students. Rather than viewing students as consumers, where university staff provide a 'customer service', these relationships must be based on mutual respect. Through implementing student-centered teaching and learning, students will gain transferable skills such as problem solving, critical thinking and reflective thinking.

LHEIs should hire an adequate number of support staff to be responsible for administrative duties and take this heavy burden away from academic staff. Support staff may be utilized to regularly check that the course content has been updated. The lecturers should share with the learners their availability schedule to let them know when to expect a response from a lecturer. A backup plan should be put in place in cases where the lecturers will be out of reach or unavailable for a long period and staff members should be provided for support. It would be beneficial for e-learning policies to have the course content available in Arabic and English languages. Since the country has not yet reached a stage where most of the learning materials are home developed, it might be premature to suggest course content to be only in Arabic, as English is considered to be the medium of instruction.

8.3.3 Technological Recommendations

Adequate technical support should be provided to e-learning users in the *Engineering school*. The lack of such support is a major concern for students and lecturers at present, because the provision of adequate technical support is undoubtedly essential for the success of e-learning initiatives.

This includes teacher training, overcoming both cultural perspectives and poor infrastructure and a lack of research, development and publication (Bukhatowa et al., 2008). Training of academics is required to increase their awareness of what can be achieved. For instance, limited or no internet access does not mean that applications such as web browsers and linked documents cannot be used.

Alternative pedagogical approaches can be provided from internet applications accessed in an offline capacity. There are many models For example, MOODLE or LAMS that are a freeware e-learning environment that can be used over an intranet when full internet capability is unavailable. The challenge is to incrementally introduce and trial these possibilities in Libya, increasing awareness of the educational possibilities that will eventually arrive with full internet capability.

13. Buy new computers renew the Labs

School of Engineering should be able to devise an annual financial budget to purchase new PCs for the Labs and develop the old equipment's; whether they require software, hardware or other tools. These orders should be purchased through the recommendation of the technical staff.

14. E-mail access:

E-mail access should be promoted as a viable e-learning option, especially at a time when the available internet infrastructure is limited and unreliable. This could provide private communication, enhance access to educational opportunities, and improve access to educational materials. It gives people the chance to access via mobile services and jump to mobile applications in the HEIs.

The technical staff must have the full responsibility to serve this access for all the stakeholders, however, they cannot work with limited quality for the VLE and weak blackboard.

15. Give access for the VLE and e-library:

There is close alignment between the e-learning strategy and the direction already being taken by the e-library over the last few years. Tripoli University must be re planning into e-library as the hub of an exciting hybrid service, to encompass the digital materials. Alongside these, with the pedagogical changes, the capabilities are being developed to enable the e-library to adapt readily to the wider changes underlying the e-learning strategy. The e-library will be adding value to e-learning by:

-providing access to high quality information to the students that is integrated with their curriculum and courses.

-ensuring that students are information literate and able to discover, evaluate and manage information.

-providing advice and assistance to students through a range of services, ensuring that these services are effectively communicated to students.

The e-library in school of Engineering at Tripoli University should be invested heavily in digital resources, particularly in terms of e-journals, abstracting and indexing services and large datasets.
Also, they should be investing in e-books, which is increasingly important for students with specific learning difficulties and disabilities.

16. Organise ICT training courses

This could be improved. Increasing student and lecturers' access to ICTs and the internet would improve their technology performance and their skills; it would positively influence their attitudes towards technology and e-learning.
Where ICT has been used it has been seen as a set of efficiency tools, rather than as an integration of these technologies into teaching (UNESCO, 2005A). Libyan academic staff need to train in both the use of new technology, so that they become familiar with it, and in the effective use of it in teaching.

To adopt and implement e-pedagogy it is necessary to continuously provide lecturers with confidence and skills via training and updated courses (Kenan et al., 2011). Teachers should be encouraged to continuously build up their experience and innovate in the process of the development of technological capabilities (Bukhatowa et al., 2008).

Tripoli university in general and the school of engineering should be active the e-learning courses at 24/7 activity; this will be not enabled without good ICT background and continues work from technical staff there; it will be necessary to investigate increasing the hours in which reference desks are available and to explore innovative ways of supporting students, for example via 'chat-group' software. Working alongside academic colleagues, library staff should be keeping abreast of new software to support e-learning. Social media will provide an excellent environment for this exploration and discovery. Also, the course lecturers and developers should attend regular training courses related to the new hardware, software and learning management packages.

8.4 The links between the recommendations of the strategy and the I-cube

This linked will be determined the highlight points which needs to an urgent solution and which one should be started according to important level. From table 9.3 the highest points that need to immediately solve were the quality standards; then the Student's Culture, Diversity and Access ICT Infrastructure.
From the barriers and SWOT analysis; the current background of Libyan ICT needs to work hard from profession technical teams to solve the digital gab in Libyan HEIs as first stage to e-learning implementation.

Table 8.3: the linked between the (I-CUBE) and the recommendations of strategy.

Recommendations / I-cube edges	*Institutional Recommendations*			*Pedagogical Recommendations*			*Technological Recommendations*		
	Quality Standards	**Training Courses**	**Collaboration**	**Student's Culture**	**Alignment**	**Diversity**	**Buy New Computers**	**E-Mails Access**	**Access ICT Infrastructure**
Internet									
Intranet									
Information									
Infrastructure									
Implementation									
Improvement									
Interactive learning									
Innovation									
Internationalization									
Initial skills									
Individual skills									
Intelligent business skills									
The total linked	**8**	**6**	**3**	**7**	**4**	**7**	**4**	**5**	**7**

8.5 Chapter summary

Over the last decade, ICT, such as the Internet, video conferencing and computer-mediated communication, have become powerful tools in the tertiary education sector (Oliver & Conole, 2003). Technological development has forced academia to integrate technology into education to support all forms of learning. Salmon (2004) has highlighted that teaching and learning experiences are successful when ICT is used to develop interactive learning environments. The spread and rapid change in ICT has resulted in many university staff changing the way they teach. Not everything is available in Libya. The internet will be required for communication with the word.

Seemingly, there is so much available to universities in developed nations and so little available for universities in developing countries. While internet infrastructure is being introduced in Libyan HEIs there is an opportunity to develop the academic staff in readiness and at the same time to develop and improve the teaching and learning environment. The natural extension of our current work is in the development of an in-service awareness learning program. This strategy is providing insights into the Libyan HEIs and trying to solve several challenges that must be overcome before technological, pedagogical and institutional into e-learning can be introduced.

From the several implications of the results. An under-investment was identified in several areas, suggesting the following prioritised improvements:

(1) Lecturers must adopt an active role and make additional efforts to encourage student participation;

(2) Allocate resources to teaching students how to learn online and helping them in their transition to e-learning;

(3) Invest more resources to provide different ways to promote teacher–student interaction.

Students' skills and needs are changing, and institutions must be aware of these changes in order to adapt the allocation of their resources to the actual requirements. In summary, the findings of this study can help colleges and schools learn more about how to enhance e-learning quality while simultaneously promoting efficiency in the investment of resources.

The (I-cube) model could be a promising tool for assessing quality in any learning modality. Future research is also needed to address this issue. Also, it could be interesting to compare the findings with those that would be found using more traditional tools for assessing student satisfaction with teaching. This comparison may help universities to select the appropriate assessment instrument to make adequate strategic decisions.

The conclusions for this thesis are presented in the next chapter.

Chapter 9: Conclusions and Future Work

9.1 Conclusions

The main aim of the study was to generate recommendations for the development of e-learning strategy at the School of Engineering in Tripoli University Libya. They have been based on the barriers identification and SWOT analysis of the e-learning performance in LHEIs. The aims and objectives outlined in Chapter 1 have been completed. The intermediate objectives were accomplished and the following conclusions reached:

The first chapter explained the significance of this study, aim and objectives, research problem, questions and hypotheses; and the readiness of the Libyan society to adopt technology.

The second chapter presented the conclusions of the literature review related to the adoption and performance of e-learning in HE, education theories (Bloom taxonomy), Salmon model of e-learning, epistemology of e-learning and internationalizing framework in HE institutions.

The third chapter described the critical review of the publications related to the factors which are influencing the e-learning performance, quality assurance and benchmarks for universities from Arab Emirates, Australia, United States of America and United Kingdom.

The fourth chapter discussed the research methodology that was used in this study, the research philosophy, design, justification for the selection of research method, the participants and settings, and instrumentation. Also, it presented the design of questionnaires considering the reliability, validity, bias, ethical issues and researcher's reflexivity. Then the methods for the quantitative and qualitative analysis of data were described.

The fifth chapter presented the identification of the barriers to the successful e-learning implementation in the School of Engineering at Tripoli University. The stakeholders (lecturers, students and technicians) were requested to answer questionnaires developed using SmartSurvey software package. The quantitative analysis of their answers was done by using Excel and SPSS packages. The barriers were classified on three main categories: technical, cultural and mismanagement. These barriers were compared with those from MENA countries (as close culture) and UK (as international culture and developed country).

The sixth chapter depicted the SWOT model for the diagnostic of the current stage of e-learning performance in the School of Engineering at Tripoli University. It was obvious the negative influence of the conflict in Libya on the ICT infrastructure and educational activities. Also it was emphasized the necessity

to have clearly defined e-learning strategies at the national level and for individual HE institutions to overcome the technical, cultural and mismanagement barriers. The results from the SWOT analysis and the identified barriers have been used to formulate suggestions for the implementation of e-learning strategy in School of Engineering at Tripoli University in Libya.

The seventh chapter presented the details of the proposed novel I-CUBE model which can be used for the development of teaching and learning activities in a digital era. The chi-square and P-value analysis functions from SPSS were used for the quantitative analysis of the answers given by Lecturers and technicians for the selected close-ended questions. Also the qualitative analysis of the answers given by Lecturers, technicians and students for the open-ended questions revealed useful information about the factors influencing the successful e-learning implementation. There were some common opinions, which enabled to make correlations between the stakeholders' points of view and to construct the surfaces which have been included in the I-CUBE model. The sources of information for the proposed I-CUBE model were: quantitative and qualitative analysis of the stakeholders answers (see Chapter 5), conclusions for the SWOT analysis (see Chapter 6), researcher's reflections of the design, development and implementation of the e-learning package, study of the relevant publications (see Chapter 2) and researcher's personal experience.

The eighth chapter described a set of recommendations for the development of e-learning strategy in the School of Engineering at Tripoli University. These have been derived from the analysis of barriers and SWOT model related to the successful e-learning implementation in LHEIs. Also the aspects included in the proposed novel I-CUBE model for the development of teaching and learning activities, the researcher's personal experience as a student and lecturer at Tripoli University and as a PhD student at the University of Huddersfield in UK have been also taken into consideration.

9.2 Contribution to knowledge

Several areas have been identified as giving a significant contribution to knowledge under the scope of this investigation:

(a) The barriers for the successful e-learning implementation at the School of Engineering from Tripoli University have been clearly identified (see Chapter 5)

(b) The SWOT model for the diagnostic of the current stage of e-learning performance in the School of Engineering at Tripoli University has been developed (see Chapter 6)

(c) An e-learning package was designed, developed and used to improve the quality of the teaching and learning processes for the delivery of an Year 4 module by using the action research and blended approaches (Appendix F)

(d) A novel I-CUBE model Explore I-Cube model which can be used for the development of teaching and learning activities in a digital era was developed. (see Chapter 7)

(e) A set of recommendations for the development of e-learning strategy in the School of Engineering at Tripoli University was produced. (Chapter 8)

9.3 Recommendations for Future Work

- Libyan HEIs could be taking steps to turn their disadvantages into advantages through exploring and determining the characteristics, contributory factors, effects, and challenges of learning settings as they related to ICT and e-learning in HEIs in post-conflict Libya.
- This research will serve as a source of information for academics, administrators and decision-makers involved in planning, design and implementation of e-learning in Libya, by applying the I-Cube model to evaluate the activities in the future of teaching and learning.
- The proposed e-learning package will be implemented with other courses, modules and lectures for the academic team in general, and a larger sample of students from the School of Engineering, and could be applied to other Libyan HEIs in the coming academic years.
- With suitable strategy for the LHEIs, all the future development stages come easier, because they are considered the cornerstone the e-learning.
- Attitudinal aspects have been cited as determining the success or failure of adopting e-learning in institutions.
- Institutional leaders should continuously adapt themselves to changing technological environments and inculcate a positive attitude towards the adoption and implementation of e-learning within their institutions.
- For lecturers to be able to use IT confidently, they must receive continuous training to develop their pedagogical skills according to the dynamic nature of technology.
- The students, being the primary resource for HEIs, ought to have access to the internet and e-learning facilities if they are to prove themselves and achieve their goals.
- The three questionnaires that contain closed and open questions could provide suggestions for further improvements of the strategy of e-learning implementation.

- Further study of the differences between the answers given by Libyan lecturers who have never been abroad and the Libyan lecturers who are studying for Master and PhD courses in UK universities or other developed countries worldwide.
- The research results presented in this thesis could be used to develop an innovative strategy to make modern planning and developing up-to-date learning resources content using innovative technology, implementing the new learning content, and assessing it by using the TQM models as the I-S model or the I-Cube.
- A new academic approach for performance improvement in the HEIs system in Libya could be developed

and used as a benchmark for other modern learning and teaching systems from the other Arabic regions, because the countries have similar cultures.

This research can provide an evidence-based source of information for academics, administrators, and decision-makers involved in planning, design and implementation of e-learning in Libyan HEIs.

As concluding remarks, e-learning is increasingly considered an essential success issue into building the new Libya, yet research pertinent to ICT-supported learning in Libya is still limited. Educational institutions in Libya face unique challenges in comparison to developed countries. Therefore, it is necessary to understand why and what actuates students and lecturers to e-learning. A strong understanding of these obstacles; challenges or barriers allows for taking suitable actions to guarantee e-learning success. Consequently, it is expected that the findings and the strategic models (SWOT & I-cube) of this research will offer a beneficial evidence-based source of information for academics, researchers, administrators, and other decision-makers to contribute in planning, design and implementation of e-learning in Libya.

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Appendices

Appendix A:

This letter was sent the HE stakeholders (Lecturers, Technicians and students) together with the questionnaires.

Dear Colleagues,

I would like to invite you to participate in this study related to my PhD project done at the University of Huddersfield, UK. The aim of this questionnaire is to find out your opinions about the e-learning implementation in Libyan Higher Education Institutions (LHEIs).

I would be grateful if you could spend few minutes completing this questionnaire in which information received will be critical to the research results and will help evaluating different views and perceptions.

The stakeholders are classified into three categories: lecturers, students and technicians. Each category has a separate questionnaire to make the questions more specific. Each questionnaire has designed by the two languages: (Arabic + English) as following links:

For Lecturers: http://www.smart-survey.co.uk/v.asp?i=52151fecwa

By Arabic design: http://www.smart-survey.co.uk/v.asp?i=51821swgkb

For students: http://www.smart-survey.co.uk/v.asp?i=54946kkwcf
By Arabic design: http://www.smart-survey.co.uk/v.asp?i=62692tkdnx

For Technicians: http://www.smart-survey.co.uk/v.asp?i=55331jxryy
By Arabic design: http://www.smart-survey.co.uk/v.asp?i=62713pwili

It would be helpful if you could look at the relevant questionnaire for your area of interest and then answer the questions. Your feedback will be very helpful for me in order to obtain the required data from the participants of the study. The spent time of any questionnaire does not take more than 10-15 minutes. I would like to assure you that the information you give will be kept strictly confidential and will be used only for research purposes.

Please do not hesitate to contact me for further information.

With all my thanks for your cooperation,

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Appendix A1: The Lecturers' Questionnaire (Q1/English)

The questionnaires of Lecturer's view the barriers to e-learning implementation in Engineering School at Tripoli University.

Section One: Personal Information

"The information of this a questionnaire will be not use, just and excepting in the scholarly purpose."

1) Age

☐ Less than 30 years ☐ 31 -35 years ☐ 36-45 years ☐ 46- 55 years ☐ more than 55 years

2) Gender

☐ Male ☐ Female

3) Qualification: *

☐ Higher National Certificate (HNC)

☐ Baccalaureate (BEng/ BSc/ BA)

☐ Postgraduate Diploma

☐ Master degree (MSc)

☐ Master Philosophy degree (MPhil)

☐ Doctoral degree (PhD)

☐ Other, please indicate:……

4) How long is your teaching experience? *

☐ Less than 2 years ☐ 2-5 ☐ 6-8 ☐ 9-11 ☐ 12-15 ☐ 16-20 ☐ More than 20 years

5) Which school or faculty are you teaching in? (Choose all that apply) *

☐ Science school ☐ Medical school ☐ Arts school ☐ Engineering school

☐ Education School ☐ Languages school ☐ Business school ☐ Information Technology (IT) school

☐ Other, please indicate:……

6) How many hours do you teach per week?*

☐ Less than 5 hours ☐ 5-10 ☐ 11-15 ☐ 16-20 ☐ More than 20

Section Two: About the performance of e-learning system in the higher education institutes in Libya

7) How many hours do you spend using the Internet per day? *

☐ Less than 2 hours ☐ 2-5 ☐ 6-9 ☐ More than 9 hours

8) Do you think that the use of online resources or ICT have added value to your lectures?

☐ Yes, definitely ☐ maybe ☐ I don't know ☐ Not at all

9) How many hours do you spend using technology for teaching and learning per day?*

☐ Less than 2 hours ☐ 2-5 ☐ 6-9 ☐ More than 9 hours

10) Please give your opinion about the following statements by ticking the appropriate box:*

	Strongly Agree	Agree	I don't know	Disagree	Strongly Disagree
E-learning implementation will increase the efficiency of teaching.					
I support the implementation of e-learning in all HEIs in Libya.					
E-learning method is more flexible than the traditional methods.					
Blended learning should be adopted by all Libyan HEIs.					
E-learning should play an important role in curriculum development.					
E-learning can contribute in solving some educational problems (such as increasing the number of students, access to distance learning materials by disabled people, house wives, learners in remote places like desert areas, etc.)					
E-learning increases the students' motivation for learning.					
E-learning contributes to acquision of IT skills.					
E-learning assists the students to batter manage their time.					
E-learning encourages the students to learn other languages					

11) Which of the following do you consider as the most important element to achieve a successful E-learning implementation in Libyan Higher Education Institutions? (Choose all that apply)

☐ Development of ICT ☐ Financial support ☐ Activating e-courses
☐ Implementing the blended learning ☐ Developing a Blackboard Intranet
☐ Other, please indicate:……

Section Three: Barriers to E-learning implementation in Libyan Higher Education

12) Which area creates the highest number of barriers to the practical implementation of E-learning systems in Libyan Higher Education? *

- ☐ Technology
- ☐ Culture
- ☐ Mismanagement
- ☐ Other (please indicate):……..

13) In your opinion; which group has been the most resistant to the E-learning implementation in Libyan Higher Education? *

- ☐ Administrative staff
- ☐ Students and researchers
- ☐ Government team
- ☐ Academic staff
- ☐ Technical staff
- ☐ Others (please indicate):……..

14) Are you satisfied with the Internet speed in your university campus?

- ☐ Strongly satisfied
- ☐ satisfied
- ☐ Inapplicable / I don't have access of the Internet in University
- ☐ unsatisfied
- ☐ strongly unsatisfied

15) The cost of off-campus Internet access is: *

- ☐ Highly expensive
- ☐ Expensive
- ☐ I don't know
- ☐ Normal
- ☐ Cheap

16) How many IT training courses have you attended in this academic year? *

- ☐ 1-2 courses
- ☐ 2-4 courses
- ☐ More than 4 courses
- ☐ No courses

17) What materials can you upload in the VLE (Virtual Learning Environment) systems (Blackboard) of your university? (Choose all that apply) *

- ☐ Teaching materials
- ☐ Keywords.
- ☐ Videos.
- ☐ Links to websites useful for the course.
- ☐ Additional related questions.
- ☐ Animations.
- ☐ Answering the questions coming from students.
- ☐ Other, please indicate:……..

18) Which resources (Audio/visual aids) do you use in the classroom? (Choose all that apply). *

- ☐ Chalk on board.
- ☐ Flip chart or Marker-board
- ☐ Projector
- ☐ Computer for presentation
- ☐ Internet connection by cable
- ☐ Internet wireless connection
- ☐ Smart board
- ☐ Other, please indicate:……

19) Do you use the university's Email access? *

- ☐ Yes, regularly
- ☐ sometimes
- ☐ I don't have E-mail access
- ☐ Not at all.

20) What incentives or rewards have you received from your Institution? (Choose all that apply). *

- ☐ Laptop or computer when you started
- ☐ Training courses
- ☐ Financial rewards
- ☐ Payment for annual conference attendance
- ☐ Subscription to specialised journals
- ☐ Printing and publishing your publications (books, journal papers)
- ☐ None at all.
- ☐ Other, please Indicate:…….....……

Section Four: Additional comments

Please include your personal views about any aspects related to the above questions or about the practical implementation of the e-learning systems in Libyan Higher Education.(this is optional section; please feel free to add any further comments regarding this subject)

21) Write your additional Comments here:

.....……..……
……
……
……
……
……
……

Appendix A2: The Lecturers' Questionnaire Results by English.

1.1 The summary of the Lecturers' result (by English-28)**.** The results of: - Lecturers views about the barriers to e-learning implementation in Libyan Higher Education

1. Section One: Personal Information

1. Age

		Response Percent	Response Total
1	Less than 30 years	10.71%	3
2	31 -35 years	17.86%	5
3	36-45 years	32.14%	9
4	46- 55 years	35.71%	10
5	More than 55 years	3.57%	1
Analysis	Mean: 3.036 Std. Deviation: 1.052	Answered	28
	Variance: 1.106 Std. Error: 0.199	Skipped	0

2. Gender

			Response Percent	Response Total
1		Male	35.71%	10
2		Female	64.29%	18
Analysis	Mean: 1.643	Std. Deviation: 0.479	Answered	28
	Variance: 0.23	Std. Error: 0.091	Skipped	0

3. Qualification:

		Response Percent	Response Total
1	Higher National Certificate (HNC)	0.00%	0
2	Baccalaureate (BEng/ BSc/ BA)	8.70%	2
3	Postgraduate Diploma	0.00%	0
4	Master degree (MSc)	43.48%	10
5	Master Philosophy degree (MPhil)	21.74%	5
6	Doctoral degree (PhD)	26.09%	6
7	Other, please indicate:	0.00%	0
Analysis	Mean: 4.565 Std. Deviation: 1.135	Answered	23
	Variance: 1.289 Std. Error: 0.237	Skipped	5

4. How long is your teaching experience?

		Response Percent	Response Total
1	Less than 2 years	21.43%	6
2	2-5	42.86%	12
3	6-8	7.14%	2
4	9-11	7.14%	2
5	12-15	3.57%	1
6	16-20	7.14%	2
7	More than 20 years	10.71%	3

3. Qualification:

					Response Percent	Response Total
Analysis	Mean:	2.929	Std. Deviation:	1.963	Answered	28
	Variance:	3.852	Std. Error:	0.371	Skipped	0

5. Which school or faculty are you teaching in? (Choose all that apply)

		Response Percent	Response Total
1	Science school	10.71%	3
2	Medical school	7.14%	2
3	Arts school	3.57%	1
4	Engineering school	28.57%	8
5	Education School	17.86%	5
6	Languages school	14.29%	4
7	Business school	25.00%	7
8	Information Technology (IT) school	21.43%	6
9	Other, please indicate:	7.14%	2

Analysis	Mean:	7.357	Std. Deviation:	3.442	Answered	28
	Variance:	11.847	Std. Error:	0.65	Skipped	0

6. How many hours do you teach per week?

		Response Percent	Response Total
1	Less than 5 hours	25.00%	7
2	5-10	35.71%	10
3	11-15	10.71%	3
4	16-20	21.43%	6
5	More than 20	7.14%	2

Analysis	Mean:	2.5	Std. Deviation:	1.268	Answered	28
	Variance:	1.607	Std. Error:	0.24	Skipped	0

2. Section Two: About the performance of e-learning system in the higher education institutes in Libya

7. How many hours do you spend using the Internet per day?

		Response Percent	Response Total
1	Less than 2 hours	7.14%	2
2	2-5	46.43%	13
3	6-9	42.86%	12
4	More than 9 hours	3.57%	1

Analysis	Mean:	2.429	Std. Deviation:	0.678	Answered	28
	Variance:	0.459	Std. Error:	0.128	Skipped	0

8. Do you think that the use of online resources or ICT have added value to your lectures?

			Response Percent	Response Total
1	Yes, definitely		64.29%	18
2	Maybe		25.00%	7
3	I don't know		10.71%	3
4	Not at all		0.00%	0
Analysis	Mean: 1.464	Std. Deviation: 0.68	Answered	28
	Variance: 0.463	Std. Error: 0.129	Skipped	0

9. How many hours do you spend using technology for teaching and learning per day?

			Response Percent	Response Total
1	Less than 2 hours		42.86%	12
2	2-5		46.43%	13
3	6-9		7.14%	2
4	More than 9 hours		3.57%	1
Analysis	Mean: 1.714	Std. Deviation: 0.749	Answered	28
	Variance: 0.561	Std. Error: 0.142	Skipped	0

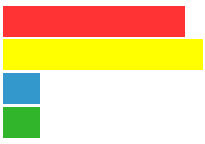
10. Please give your opinion about the following statements by ticking the appropriate box:

	Strongly Agree	Agree	I don't know	Disagree	Strongly Disagree	Response Total
E-learning implementation will increase the efficiency of teaching.	42.9% (12)	46.4% (13)	3.6% (1)	7.1% (2)	0.0% (0)	28
I support the implementation of e-learning in all HEIs in Libya.	35.7% (10)	57.1% (16)	3.6% (1)	3.6% (1)	0.0% (0)	28
e-learning method is more flexible than the traditional methods.	32.1% (9)	46.4% (13)	17.9% (5)	0.0% (0)	3.6% (1)	28
Blended learning should be adopted by all Libyan HEIs.	32.1% (9)	50.0% (14)	7.1% (2)	7.1% (2)	3.6% (1)	28
E-learning should play an important role in curriculum development.	28.6% (8)	60.7% (17)	3.6% (1)	3.6% (1)	3.6% (1)	28
E-learning can contribute in solving some educational problems (such as increasing the number of students, access to distance learning materials by disabled people, house wives, learners in remote places like desert areas, etc.)	28.6% (8)	46.4% (13)	17.9% (5)	7.1% (2)	0.0% (0)	28
E-learning increases the students' motivation for learning.	35.7% (10)	35.7% (10)	25.0% (7)	0.0% (0)	3.6% (1)	28
E-learning contributes to acquision of IT skills.	28.6% (8)	60.7% (17)	7.1% (2)	0.0% (0)	3.6% (1)	28
E-learning assists the students to batter manage their time.	17.9% (5)	50.0% (14)	17.9% (5)	10.7% (3)	3.6% (1)	28
E-learning encourages the students to learn other languages	21.4% (6)	57.1% (16)	17.9% (5)	0.0% (0)	3.6% (1)	28
					Answered	28
					Skipped	0

Matrix Charts

10.1. E-learning implementation will increase the efficiency of teaching.

		Response Percent	Response Total
1	Strongly Agree	42.9%	12
2	Agree	46.4%	13
3	I don't know	3.6%	1
4	Disagree	7.1%	2
5	Strongly Disagree	0.0%	0
		answered	28



Analysis				
	Mean:	1.75	Std. Deviation:	0.829
	Variance:	0.688	Std. Error:	0.157

10.2. I support the implementation of e-learning in all HEIs in Libya.

		Response Percent	Response Total
1	Strongly Agree	35.7%	10
2	Agree	57.1%	16
3	I don't know	3.6%	1
4	Disagree	3.6%	1
5	Strongly Disagree	0.0%	0

Analysis					
	Mean:	1.75	Std. Deviation:	0.688	answered 28
	Variance:	0.473	Std. Error:	0.13	

10.3. e-learning method is more flexible than the traditional methods.

		Response Percent	Response Total
1	Strongly Agree	32.1%	9
2	Agree	46.4%	13
3	I don't know	17.9%	5
4	Disagree	0.0%	0
5	Strongly Disagree	3.6%	1
		answered	28

Analysis				
	Mean:	1.964	Std. Deviation:	0.906
	Variance:	0.82	Std. Error:	0.171

10.4. Blended learning should be adopted by all Libyan HEIs.

		Response Percent	Response Total
1	Strongly Agree	32.1%	9
2	Agree	50.0%	14
3	I don't know	7.1%	2
4	Disagree	7.1%	2
5	Strongly Disagree	3.6%	1
		answered	28

Analysis				
	Mean:	2	Std. Deviation:	1
	Variance:	1	Std. Error:	0.189

10.5. E-learning should play an important role in curriculum development.

		Response Percent	Respon se Total
1	Strongly Agree	28.6%	8
2	Agree	60.7%	17
3	I don't know	3.6%	1
4	Disagree	3.6%	1
5	Strongly Disagree	3.6%	1
		Answered	28

Analysis				
	Mean:	1.929	Std. Deviation:	0.884
	Variance:	0.781	Std. Error:	0.167

10.5. E-learning should play an important role in curriculum development.	Response Percent	Response Total

10.6. E-learning can contribute in solving some educational problems (such as increasing the number of students, access to distance learning materials by disabled people, house wives, learners in remote places like desert areas, etc.)		Response Percent	Response Total
1	Strongly Agree	28.6%	8
2	Agree	46.4%	13
3	I don't know	17.9%	5
4	Disagree	7.1%	2
5	Strongly Disagree	0.0%	0
Analysis	Mean: 2.036 Std. Deviation: 0.865 Variance: 0.749 Std. Error: 0.164	Answered	28

10.7. E-learning increases the students' motivation for learning.		Response Percent	Response Total
1	Strongly Agree	35.7%	10
2	Agree	35.7%	10
3	I don't know	25.0%	7
4	Disagree	0.0%	0
5	Strongly Disagree	3.6%	1
Analysis	Mean: 2 Std. Deviation: 0.964 Variance: 0.929 Std. Error: 0.182	Answered	28

10.8. E-learning contributes to acquision of IT skills.		Response Percent	Response Total
1	Strongly Agree	28.6%	8
2	Agree	60.7%	17
3	I don't know	7.1%	2
4	Disagree	0.0%	0
5	Strongly Disagree	3.6%	1
Analysis	Mean: 1.893 Std. Deviation: 0.817 Variance: 0.667 Std. Error: 0.154	Answered	28

10.9. E-learning assists the students to batter manage their time.

		Response Percent	Response Total
1	Strongly Agree	17.9%	5
2	Agree	50.0%	14
3	I don't know	17.9%	5
4	Disagree	10.7%	3
5	Strongly Disagree	3.6%	1
		Answered	28

Analysis	Mean:	2.321	Std. Deviation:	1.002
	Variance:	1.004	Std. Error:	0.189

10.10. E-learning encourages the students to learn other languages

		Response Percent	Response Total
1	Strongly Agree	21.4%	6
2	Agree	57.1%	16
3	I don't know	17.9%	5
4	Disagree	0.0%	0
5	Strongly Disagree	3.6%	1
		Answered	28

Analysis	Mean:	2.071	Std. Deviation:	0.842
	Variance:	0.709	Std. Error:	0.159

11. Which of the following do you consider as the most important element to achieve a successful E-learning implementation in Libyan Higher Education Institutions? (Choose all that apply)

		Response Percent	Response Total
1	Development of ICT	75.00%	21
2	Financial support	53.57%	15
3	Activating e-courses	50.00%	14
4	Implementing the blended learning	39.29%	11
5	Developing a Blackboard Intranet	46.43%	13
6	Other, please indicate:	10.71%	3
		Answered	28
		Skipped	0

Analysis	Mean:	7.857	Std. Deviation:	8.686
	Variance:	75.444	Std. Error:	1.641

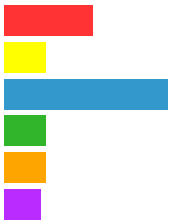
3. Section Three: Barriers to E-learning implementation in Libyan Higher Education

12. Which area creates the highest number of barriers to the practical implementation of E-learning systems in Libyan Higher Education

		Response Percent	Response Total
1	Technology	32.14%	9
2	Culture	25.00%	7
3	Mismanagement	42.86%	12
4	Other (please indicate):	0.00%	0
Analysis	Mean: 2.107 Std. Deviation: 0.859	Answered	28
	Variance: 0.739 Std. Error: 0.162	Skipped	0

13. In your opinion; which group has been the most resistant to the E-learning implementation in Libyan Higher Education?

		Response Percent	Response Total
1	Administrative staff	21.43%	6
2	Students and researchers	10.71%	3
3	Government team	39.29%	11
4	Academic staff	10.71%	3
5	Technical staff	10.71%	3
6	Others (please indicate):	7.14%	2
Analysis	Mean: 3 Std. Deviation: 1.464	Answered	28
	Variance: 2.143 Std. Error: 0.277	Skipped	0



14. Are you satisfied with the Internet speed in your university campus?

		Response Percent	Response Total
1	Strongly satisfied	17.86%	5
2	Satisfied	14.29%	4
3	Inapplicable / I don't have access	32.14%	9
4	Unsatisfied	17.86%	5
5	Strongly unsatisfied	17.86%	5
Analysis	Mean: 3.036 Std. Deviation: 1.322	Answered	28
	Variance: 1.749 Std. Error: 0.25	Skipped	0

15. The cost of off-campus Internet access is:

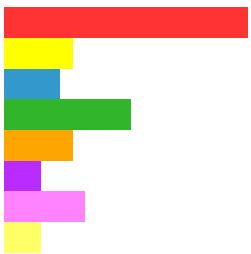
		Response Percent	Response Total
1	Highly expensive	7.14%	2
2	Expensive	28.57%	8
3	I don't know	53.57%	15
4	Normal	10.71%	3
5	Cheap	0.00%	0
Analysis	Mean: 2.679 Std. Deviation: 0.758	Answered	28
	Variance: 0.575 Std. Error: 0.143	Skipped	0

16. How many IT training courses have you attended in this academic year?

		Response Percent	Response Total
1	1-2 courses	17.86%	5
2	2-4 courses	14.29%	4
3	More than 4 courses	17.86%	5
4	No courses	50.00%	14
Analysis	Mean: 3 Std. Deviation: 1.165	Answered	28
	Variance: 1.357 Std. Error: 0.22	Skipped	0

17. What materials can you upload in the VLE (Virtual Learning Environment) systems (Blackboard) of your university? (Choose all that apply)

		Response Percent	Response Total
1	Teaching materials	75.00%	21
2	Keywords.	21.43%	6
3	Videos.	17.86%	5
4	Links to websites useful for the course.	39.29%	11
5	Additional related questions.	21.43%	6
6	Animations.	3.57%	1
7	Answering the questions coming from students.	25.00%	7
8	Other, please indicate:	10.71%	3
Analysis	Mean: 7.179 Std. Deviation: 6.528	Answered	28
	Variance: 42.612 Std. Error: 1.234	Skipped	0



18. Which resources (Audio/visual aids) do you use in the classroom? (Choose all that apply).

		Response Percent	Response Total
1	Chalk on board.	42.86%	12
2	Flip chart or Marker-board	39.29%	11
3	Projector	35.71%	10
4	Computer for presentation	28.57%	8
5	Internet connection by cable	7.14%	2
6	Internet wireless connection	3.57%	1
7	Smart board	7.14%	2
8	Other, please indicate:	0.00%	0
Analysis	Mean: 4.5 Std. Deviation: 3.021	Answered	28
	Variance: 9.125 Std. Error: 0.571	Skipped	0

19. Do you use the university's Email access?

		Response Percent	Response Total
1	Yes, regularly	21.43%	6
2	Sometimes	28.57%	8
3	I don't have E-mail access	39.29%	11
4	Not at all.	10.71%	3
Analysis	Mean: 2.393 Std. Deviation: 0.939	Answered	28
	Variance: 0.881 Std. Error: 0.177	Skipped	0

20. What incentives or rewards have you received from your Institution? (Choose all that apply).

		Response Percent	Response Total
1	Laptop or computer when you started	7.14%	2
2	Training courses	17.86%	5
3	Financial rewards	3.57%	1
4	Payment for annual conference attendance	3.57%	1
5	Subscription to specialised journals	0.00%	0
6	Printing and publishing (books, journal papers)	0.00%	0
7	None at all.	71.43%	20
8	Other, please Indicate:	0.00%	0
Analysis	Mean: 5.679 Std. Deviation: 2.363	Answered	28
	Variance: 5.584 Std. Error: 0.447	Skipped	0

4. Section Four: Additional comments

21. Write your additional Comments here:

		Response Percent	Response Total
1	Open-Ended Question	100.00%	18

1	ID: 4523625	Nothing to add
2	ID: 5076293	I hope success in your survey
3	ID: 5077399	No comments
4	ID: 5078954	In my opinion the online environment is a very successful discovery, especially through communication between individuals and people anywhere and anytime, where the world has become a small village. This in turn has been reflected in all fields including social, scientific, political and even cultural with all advantages disadvantages
5	ID: 5080644	Implementation of IT will change learning at higher education levels.
6	ID: 5082995	Good luck
7	ID: 5150639	I think carrying out such a research will contribute to create an innovative learning environment and could enhance the pedagogical techniques applied in the Libyan educational institutions.

21. Write your additional Comments here:

			Response Percent	Response Total
		Good luck		
8	ID: 5408302	I hope was your survey success and helpful I your study		
9	ID: 6086101	Thank you		
10	ID: 6115633	To achieve better e-Learning, the educational system with all its branches has to be reformed. Institutes and universities are in need to have access to the internet in all their departments and curricula. Staffs are supposed to be trained and have continuous training on implementing e-learning.		
11	ID: 6173205	We need to support the Libyan student in education by using a high technological (IT)		
12	ID: 6205914	Other barriers: individual barriers such as lack of experience and limited awareness of technology-based learning. Technological barriers such as lack of infrastructure, limited Internet access and computer storage. Pedagogical barriers such as new curriculum design and new teaching methods. Also some contextual barriers such as lack of motivation among students, shortage of student's self -efficacy, shortage of e-learning developers and teachers, lack of training, lack of budget & resources and lack of adequate administrative support.		
13	ID: 6380965	The most important problems are poor resources and materials in our institutions		
14	16/3/15 12:11AM ID: 6381619	We want from the ministry put a good strategy for online curriculum		
15	16/3/15 12:11AM ID: 6412574	In my opinion e-learning has essential role in supporting knowledge and learning .in my opinion, it is important to include administrative staff for example, executive manager, general managers, because they are essential part in environment of learning.		
16	16/3/15 12:11AM ID: 13263816	It is good idea to teach or learn the student with a new technology in future.		
17	16/3/15 12:11AM ID: 13265452	E-learning help both teacher and student for teaching and learning		
18	16/3/15 12:11AM ID: 13533500	Unavailability of the internet in our university for everyone may be is one point of the issue		
			Answered	18
			Skipped	10

Appendix A3: The Lecturers' Questionnaire Results by Arabic.

(Questionnaire1 by Arabic language) مؤسسات في الالكتروني التعليم تنفيذ عملية تواجه التي الصعوبات حول إستبيان
والأكاديميين للأساتذة مخصص الاستبيان هذا -ليبيا في العالي التعليم
The questionnaires of Lecturer's view the barriers to e-learning implementation in Engineering School at Tripoli University.

يواجهها التي والصعوبات له الفعلي الواقع بعرض وذلك الالكتروني التعليم أداء لتحسين الاستبيان هذا يهدف.

1. العامة المعلومات **:** الأول الجزء
Section One: Personal Information

1. عمرك؟ تدرج أن يمكن الأتية المجموعات من مجموعة أي في

- Age

			Response Percent	Response Total
1	سنة 30 الـــ من أقل	Less than 30 years	5.88%	1
2	سنة 31-35 من	31 -35 years	0.00%	0
3	سنة 36-45 من	36-45 years	64.71%	11
4	سنة 46-55 من	46- 55 years	23.53%	4
5	سنة 55 من أكبر	More than 55 years	5.88%	1
			Answered	17
			Skipped	0

2. أنت هل ؟
Gendars

			Response Percent	Response Total
1	ذكر	Male	52.94%	9
2	أنثى	Female	47.06%	8
			Answered	17
			Skipped	0

3. التعليمي المؤهل:
Qualification:

			Response Percent	Response Total
1	عالي معهد	Higher National Certificate (HNC)	5.88%	1
2	بكالوريوس	Baccalaureate (BEng/ BSc/ BA)	5.88%	1
3	عالي دبلوم	Postgraduate Diploma	5.88%	1
4	ماجستير	Master degree (MSc)	64.71%	11
5	إمفيل	Master Philosophy degree (MPhil)	5.88%	1
6	دكتوراة	Doctoral degree (PhD)	11.76%	2
7	رجاءَ ـ ذلك غير هنا أضفها :	Other, please indicate:…	0.00%	0
			Answered	17
			Skipped	0

4. العالي؟ التعليم في خبرتك سنوات
How long is your teaching experience?

			Response Percent	Response Total
1	سنتين من أقل	Less than 2 Years	17.65%	3
2	سنوات 2-5 من	2 - 5 Years	17.65%	3
3	سنوات 6-8 من	6 - 8 Years	35.29%	6
4	سنة 9-11 من	9 - 11 Years	11.76%	2
5	سنة 12-15 من	12 - 15 Years	5.88%	1
6	سنة 16-20 من	16 – 20 Years	11.76%	2
7	سنة 20 من أكثر	More than 20	0.00%	0
			Answered	17
			Skipped	0

5. ا -:(إجابة من أكثر اختيار يمكنك) معها؟ تتعاون التي كليات وما تعمل؟ أنت كلية اي في
Which school or faculty are you teaching in? (Choose all that apply)

			Response Percent	Response Total
1	العلوم كلية	Science school	47.06%	8

5. ا -:(إجابة من أكثر اختيار يمكنك) معها؟ تتعاون التي كليات وما تعمل؟ أنت كلية اي في
Which school or faculty are you teaching in? (Choose all that apply)

				Response Percent	Response Total
2	الطبية العلوم كلية	Medical school		5.88%	1
3	الفنون كلية	Arts school		0.00%	0
4	الهندسة كلية	Engineering school		76.47%	13
5	والتعليم التربية كلية	Education School		11.76%	2
6	اللغات كلية	Languages school		5.88%	1
7	الاقتصاد كلية	Business school		11.76%	2
8	المعلومات تقنية كلية	Information Technology (IT) school		17.65%	3
9	كلية:إدرجها رجاءَ - - أخرى	Other, please indicate:		5.88%	1
				Answered	17
				Skipped	0

6. اسبوعيا؟ تنجز ها التي التدريس ساعات عدد كم
How many hours do you teach per week?

				Response Percent	Response Total
1	ساعات 5 من أقل	Less than 5 hours		17.65%	3
2	ساعات 5-10 من	5 – 10 hours		17.65%	3
3	ساعة 11-15 من	11– 15 hours		41.18%	7
4	ساعة 16-20 من	16– 20 hours		5.88%	1
5	ساعة 20 من أكثر	More than 20		17.65%	3
				Answered	17
				Skipped	0

الثاني الجزء **2.** الدراسة نظام حول:

7. الواحد؟ اليوم في الانترنت مستخدما تقضيها التي الساعات عدد يتراوح كم
How many hours do you spend using the Internet per day?

				Response Percent	Response Total
1	ساعتين- 2 من أقل	Less than 2 hours		11.76%	2
2	يوميا 2-5 من	2 – 5 hours		70.59%	12
3	يوميا 6-9 من	6 – 9 hours		17.65%	3
4	ساعات 9 من أكثر	More then 9 hours		0.00%	0
				Answered	17
				Skipped	0

8. محاضراتك؟ لمحتوى قيمة أضافت - متكاملة كمنظومة والاتصالات المعلومات وتقنية الانترنت مصادر أن تعتقد هل
Do you think that the use of online resources or ICT have added value to your lectures?

				Response Percent	Response Total
1	نعم	Yes, definitely		52.94%	9
2	قليلا	Maybe		41.18%	7
3	أعرف لا	I don't know		5.88%	1
4	لا	Not at all		0.00%	0
				Answered	17
				Skipped	0

9. الانترنيت من المساعدة والمصادر الكمبيوتر **(** الرقمية التقنية باستخدام الدرس أو المحاضرة لإعداد تقضيها التي الساعات عدد هي كم؟
) How many hours do you spend using technology for teaching and learning per day?

				Response Percent	Response Total
1	من أقل ساعتين	Less than 2 hours		41.18%	7
2	2-5 من ساعات	2 – 5 hours		52.94%	9
3	6-9 من ساعات	6 – 9 hours		5.88%	1
4	9 من أكثر ساعات	More than 9 hours		0.00%	0
				Answered	17
				Skipped	0

	أوافق بشدة Strongly Agree 1	أوافق Agree 2	أعرف لا I don't know 3	أوافق لا Disagree 4	أوافق لا بشدة Strongly Disagree 5	Resp. Total
يزيد سوف الالكتروني التعليم تنفيذ التعليم فاعلية في	29.4% (5)	58.8% (10)	11.8% (2)	0.0% (0)	0.0% (0)	17
في الالكتروني التعليم تنفيذ ادعم أنا ليبيا في العالي التعليم مؤسسات كل	17.6% (3)	70.6% (12)	5.9% (1)	5.9% (1)	0.0% (0)	17
تكون الالكتروني التعليم طريقة في التقليدية الطريقة من مرونة اكثر التعليم	23.5% (4)	58.8% (10)	17.6% (3)	0.0% (0)	0.0% (0)	17
الالكتروني-المزدوج التعليم كل في يعتمد أن يجب - والتقليدي الليبي العالي التعليم مؤسسات	23.5% (4)	47.1% (8)	11.8% (2)	17.6% (3)	0.0% (0)	17
مهم دور يلعب الالكتروني التعليم المناهج تطوير في	23.5% (4)	47.1% (8)	17.6% (3)	11.8% (2)	0.0% (0)	17
حل في يساهم الالكتروني التعليم الطلبة عدد كزيادة - التعليم مشاكل الخاصة الحاجات ذوي وتعليم البيوت وربات	23.5% (4)	47.1% (8)	23.5% (4)	5.9% (1)	0.0% (0)	17
قدرات من يزيد الالكتروني التعليم الطلبة لدى الابداع	17.6% (3)	41.2% (7)	23.5% (4)	11.8% (2)	5.9% (1)	17
الطلبة يكسب الالكتروني التعليم متجددة تقنية مهارات	47.1% (8)	41.2% (7)	11.8% (2)	0.0% (0)	0.0% (0)	17
الطلبة يساعد الالكتروني التعليم أفضل بشكل وقتهم إدارة على	5.9% (1)	64.7% (11)	17.6% (3)	11.8% (2)	0.0% (0)	17
الطلبة يشجع الالكتروني التعليم أخرى لغات كسب على	41.2% (7)	47.1% (8)	5.9% (1)	5.9% (1)	0.0% (0)	17
					Answered	17
					Skipped	0

Matrix Charts

10.1. التعليم فاعلية في يزيد سوف الالكتروني التعليم تنفيذ E-learning implementation will increase the efficiency of teaching.				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		29.4%	5
2	أوافق	Agree		58.8%	10
3	أعرف لا	I don't know		11.8%	2
4	أوافق لا	Disagree		0.0%	0
5	بشدة أوافق لا	Strongly Disagree		0.0%	0
				Answered	17

10.2. ليبيا في العالي التعليم مؤسسات كل في الالكتروني التعليم تنفيذ ادعم أنا I support the implementation of e-learning in all HEIs in Libya.				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		17.6%	3
2	أوافق	Agree		70.6%	12
3	أعرف لا	I don't know		5.9%	1
4	أوافق لا	Disagree		5.9%	1
5	بشدة أوافق لا	Strongly Disagree		0.0%	0
				Answered	17

10.3. التعليم في التقليدية الطريقة من مرونة اكثر تكون الالكتروني التعليم طريقة E-learning method is more flexible than the traditional methods.				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		23.5%	4
2	أوافق	Agree		58.8%	10
3	أعرف لا	I don't know		17.6%	3
4	أوافق لا	Disagree		0.0%	0
5	بشدة أوافق لا	Strongly Disagree		0.0%	0
				Answered	17

10.4. الليبي العالي التعليم مؤسسات كل في يعتمد أن يجب - والتقليدي الالكتروني-المزدوج التعليم Blended learning should be adopted by all Libyan HEIs				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		23.5%	4
2	أوافق	Agree		47.1%	8
3	أعرف لا	I don't know		11.8%	2
4	أوافق لا	Disagree		17.6%	3
5	بشدة أوافق لا	Strongly Disagree		0.0%	0
				Answered	17

10.5. المناهج تطوير في مهم دور يلعب الالكتروني التعليم E-learning should play an important role in curriculum development.				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		23.5%	4
2	أوافق	Agree		47.1%	8
3	أعرف لا	I don't know		17.6%	3
4	أوافق لا	Disagree		11.8%	2
5	بشدة أوافق لا	Strongly Disagree		0.0%	0
				Answered	17

10.6. الحاجات ذوي وتعليم الطلبة عدد كزيادة - التعليم مشاكل حل في يساهم الالكتروني التعليم البيوت وربات الخاصة E-learning can contribute in solving some educational problems (such as increasing the number of students, access to distance learning materials by disabled people, house wives, learners in remote places like desert areas, etc.)				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		23.5%	4
2	أوافق	Agree		47.1%	8
3	أعرف لا	I don't know		23.5%	4
4	أوافق لا	Disagree		5.9%	1
5	بشدة أوافق لا	Strongly Disagree		0.0%	0
				Answered	17

10.7. الطلبة لدى الابداع قدرات من يزيد الالكتروني التعليم E-learning increases the students' motivation for learning.				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		17.6%	3
2	أوافق	Agree		41.2%	7
3	أعرف لا	I don't know		23.5%	4
4	أوافق لا	Disagree		11.8%	2
5	بشدة أوافق لا	Strongly Disagree		5.9%	1
				Answered	17

10.8. متجددة تقنية مهارات الطلبة يكسب الالكتروني التعليم E-learning contributes to acquisition of IT skills.				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		47.1%	8
2	أوافق	Agree		41.2%	7
3	أعرف لا	I don't know		11.8%	2
4	أوافق لا	Disagree		0.0%	0
5	بشدة أوافق لا	Strongly Disagree		0.0%	0
				Answered	17

10.9. أفضل بشكل وقتهم إدارة على الطلبة يساعد الالكتروني التعليم E-learning assists the students to better manage their time.				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		5.9%	1
2	أوافق	Agree		64.7%	11
3	أعرف لا	I don't know		17.6%	3
4	أوافق لا	Disagree		11.8%	2
5	بشدة أوافق لا	Strongly Disagree		0.0%	0

10.9. أفضل بشكل وقتهم إدارة على الطلبة يساعد الالكتروني التعليم E-learning assists the students to better manage their time.	Response Percent	Response Total
	Answered	17

10.10. أخرى لغات كسب على الطلبة يشجع الالكتروني التعليم E-learning encourages the students to learn other languages				Response Percent	Response Total
1	بشدة أوافق	Strongly Agree		41.2%	7
2	أوافق	Agree		47.1%	8
3	أعرف لا	I don't know		5.9%	1
4	أوافق لا	Disagree		5.9%	1
5	بشدة أوافق لا	Strongly Disagree		0.0%	0
				Answered	17

11. (إجابة من أكثر اختيار يمكنك) ليبيا؟ في العالي التعليم مؤسسات في ناجح إلكتروني تعليم لإنجاز أهمية الأكثر العنصر يعتبر الآتي من أي :
Which of the following do you consider as the most important element to achieve a successful E-learning implementation in Libyan Higher Education Institutions? (Choose all that apply)

				Response Percent	Response Total
1	(ICT) التحتية البنية تطوير والتقنية للإتصالات	Development of ICT		100.00%	17
2	المالي الدعم	Financial support		47.06%	8
3	التي (الرقمية المناهج) تفعيل الالكتروني التفاعل على تعتمد	Activating e-courses		29.41%	5
4	المزدوج التعليم تنفيذ	Implementing the blended learning		52.94%	9
5	الالكترونية المنظومة تطوير جامعة لكل والخاصة الداخلية	Developing a Blackboard Intranet		58.82%	10
6	هنا أضفه رجاءآ- أخر شيء:	Other, please indicate		0.00%	0
				Answered	17
				Skipped	0

3. الثالث الجزء :ليبيا في العالي التعليم مؤسسات في الالكتروني التعليم تنفيذ تعيق التي والصعوبات الموانع

12. ليبيا؟ في العالي التعليم مؤسسات في الالكتروني التعليم نظام لتنفيذ الأكبر المانع أو الصعوبة يمثل التالية المجالات من مجال أي
Which area creates the highest number of barriers to the practical implementation of E-learning systems in Libyan Higher Education?

				Response Percent	Response Total
1	ليبيا في الحالية التكنولوجيا أو التقنية	Technology		41.18%	7
2	الثقافة	Culture		17.65%	3
3	الإدارة سوء	Mismanagement		41.18%	7
				Answered	17
				Skipped	0

13. ليبيا؟ في العالي التعليم مؤسسات في الالكتروني التعليم لتنفيذ مقاومة الأكثر تعتبر - التالية المجموعات من مجموعة أي
In your opinion; which group has been the most resistant to the E-learning implementation in Libyan Higher Education?

				Response Percent	Response Total
1	الإداري الطاقم	Administrative staff		23.53%	4
2	والباحثون الطلبة	Students and researchers		5.88%	1
3	المسؤولة الحكومية الجهة	Government team		52.94%	9
4	التدريس هيئة وأعضاء الأكاديميين	Academic staff		11.76%	2
5	والفنيين التقنيين	Technical staff		5.88%	1
6	إضافتها يمكنك :أخرى مجموعة	Others (please indicate)		0.00%	0
				Answered	17
				Skipped	0

14. الجامعي؟ الحرم في (الإنترنت) أداء سرعة على راضي أنت هل
Are you satisfied with the Internet speed in your university campus?

				Response Percent	Response Total
1	وبقوة راضي	Strongly satisfied		0.00%	0
2	راضي	Satisfied		11.76%	2
3	غير)موجودة غير الكلية في حاليا (مفعّلة	Inapplicable / I don't have access of the Internet in University		17.65%	3
4	راضي غير	Unsatisfied		47.06%	8
5	وبقوة راضي غير	strongly unsatisfied		23.53%	4
				Answered	17
				Skipped	0

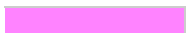
15. تعتبر؟ الجامعي الحرم خارج (الانترنت) خدمات في الاشتراك سعر
The cost of off-campus Internet access is ?

				Response Percent	Response Total
1	جداً باهضة	Highly expensive		5.88%	1
2	الشيء بعض باهضة	Expensive		23.53%	4
3	أعرف لا	I don't know		29.41%	5
4	ومعقولة مقبولة	Normal		35.29%	6
5	رخيصة	Cheap		5.88%	1
				Answered	17
				Skipped	0

16. السنة؟ هذه خلال المعلومات تقنية على بالتدرب تتعلق تدريبية دورة حضرت كم
How many IT training courses have you attended in this academic year?

				Response Percent	Response Total
1	إثنين أو دورة	1-2		23.53%	4
2	دورات أربعة أو ثلاثة	3-4		0.00%	0
3	دورات ٤ من أكثر	More than 4		11.76%	2
4	دورة أي أحضر لم	No course		64.71%	11
				Answered	17
				Skipped	0

17. ا-:(إجابة من أكثر اختيار يمكنك)بالجامعة؟ الخاصة الالكترونية المنظومة إلى تضيفها أو تحملها أن يمكن التي المواد هي ما
What materials can you upload in the VLE (Virtual Learning Environment) systems (Blackboard) of your university? (Choose all that apply

				Res. Percent	Res. Total
1	المنهج أو الدراسة مادة	Teaching materials		47.06%	8
2	توضيحية أفكار أو أقلام رؤوس	Keywords.		58.82%	10
3	فيديو مقاطع	Videos.		17.65%	3
4	الانترنت وصفحات المواقع بعض الفهم على تساعد التي	Links to websites useful for the course		58.82%	10
5	إضافية أسئلة	Additional related questions		70.59%	12
6	وحركية صوتية مؤثرات	Animations		5.88%	1
7	الطلبة تساؤلات إجابة	Answering the questions coming from students		64.71%	11
8	هنا أضفها - أخرى أشياء	Other, please indicate		0.00%	0
				Answered	17
				Skipped	0

18. ا-:(إجابة من أكثر اختيار يمكنك) استخدامها؟ لك يتاح والتي الدرس؟ حجرة في المجهزة والبصرية السمعية الوسائل هي ما
Which resources (Audio/visual aids) do you use in the classroom? (Choose all that apply).

			Response Percent	Response Total
1	والطباشير السبورة	Chalk on board.	17.65%	3
2	التي البيضاء السبورة أو ورقية لوحات الملونة الخطاط بأقلام عليها يكتب	Flip chart or Marker-board	64.71%	11
3	البروجكتر ـ العرض جهاز	Projector	47.06%	8
4	حاسوب	Computer for presentation	29.41%	5
5	كابل-للإنترنت وصلة	Internet connection by cable	5.88%	1
6	لاسلكي-للإنترنت وصلة	Internet wireless connection	0.00%	0
7	الذكية السبورة	Smart board	5.88%	1
8	هنا أضفها ـ أخرى أشياء	Other, please indicate	0.00%	0
			Answered	17
			Skipped	0

19. بالجامعة؟ الخاص الإيميل أو الإلكتروني البريد تستخدم هل
Do you use the university's Email access?

			Response Percent	Response Total
1	ومنتظم دائم بشكل- نعم	Yes, regularly	23.53%	4
2	أحيانا	Sometimes	29.41%	5
3	الايميل أو البريد هذا أملك لا	I don't have E-mail access	47.06%	8
4	أبدا استخدمه لا	Not at all.	0.00%	0
			Answered	17
			Skipped	0

20. ا-:(إجابة من أكثر اختيار يمكنك) عملك؟ بداية منذ عليها تحصلت التي المكافآت هي ما
What incentives or rewards have you received from your Institution? (Choose all that apply).

			Response Percent	Response Total
1	محمول حاسوب	Laptop or computer when you started	0.00%	0
2	تدريبية دورات	Training courses	5.88%	1

20. ا-:(إجابة من أكثر اختيار يمكنك) عملك؟ بداية منذ عليها تحصلت التي المكافآت هي ما
What incentives or rewards have you received from your Institution? (Choose all that apply).

				Response Percent	Response Total
3	مالية مكافآت	Financial rewards		29.41%	5
4	حضور رسوم دفع سنويا مؤتمر	Payment for annual conference attendance		5.88%	1
5	في اشتراك عضوية خاصة مجلة	Subscription to specialised journals		0.00%	0
6	المقالات ونشر طباعة الكتب أو	Printing and publishing your publications (books, journal papers)		0.00%	0
7	ذلك من شيء لا	None at all.		70.59%	12
8	أضفها - أخرى أشياء هنا	Other, please Indicate		0.00%	0
				Answered	17
				Skipped	0

4. أخرى إضافات :الرابع الجزء

21. هنا إضافتك أكتب
Write your additional Comments here

			Response Percent	Response Total
1	Open-Ended Question		100.00%	5
	1	ID: 5079522	The e-learning is the best way to improve the level of our education, especially in this stage of changing from the revolution to build the state.	
	2	ID: 5079779	العالي التعليم مؤسسات وفي ليبيا داخل التعليمية بالعملية النهوض في اساعد ان ويسعدني مجهوداتكم لكم أشكر دائما الوقت توفر لعدم العملية هده تتكرر لا ان على	
	3	ID: 5083003	من عليه والصرف التمويل من مزيد الي يحتاج ليبيا في العالي التعليم منظومة في الالكتروني التعليم تنفيذ الحكومة	
	4	ID: 5088568	أحد يهتم ولم المسولين من الدورات بعض طلبت :الخاص حسابي على كانت حضرتها التي الدورات: 18 السؤال فقط المعامل في موجود الحاسوب : 20ال السؤال. الخامسة السنة الى الاولى السنة من الطلبة لكل معامل 3 فقط لديها الهندسة وكلية	
	5	ID: 6381233	N/A	
			Answered	5
			Skipped	12

Appendix B

Appendix B1: The Students' Questionnaire (Q2/English)

The questionnaires of Student's view the barriers to e-learning implementation in Engineering School at Tripoli University.

Section One: Personal Information

"The information of this a questionnaire will be not use, just and excepting in the scholarly purpose."

1) Age*

☐ Less than 20 years ☐ 21 -25 years ☐ 26-30 years ☐ 31- 35 years ☐ More than 35 years

2) Gender*

☐ Male ☐ Female

3) Current educational level:*

☐ Technical National Diploma (TND) ☐ Higher National Certificate (HNC)
☐ Baccalaureate (BEng/ BSc/ BA) ☐ Postgraduate Diploma
☐ Master degree (MSc) ☐ Master Philosophy degree (MPhil)
☐ Doctoral degree (PhD) ☐ Professor
☐ Other:……

4) Last qualifications:*

☐ Technical National Diploma (TND) ☐ Higher National Certificate (HNC)
☐ Baccalaureate (BEng/ BSc/ BA) ☐ Postgraduate Diploma
☐ Master degree (MSc) ☐ Master Philosophy degree (M.Phil.)
☐ Doctoral degree (PhD) ☐ Professor
☐ Other:……

5) Do you study now? *

☐ Yes, as full time ☐ yes, as part time
☐ No, I have stopped my course ☐ No, I have completed my course

6) In which school or faculty are you studying? *

☐ Science school ☐ Medical school
☐ Arts school ☐ Engineering school
☐ Education school ☐ Information Technology (IT) school
☐ Languages school ☐ Business school
☐ Other, please indicate:……

7) Where are you studying? *

☐ Libya ☐ UK ☐ Other country, please indicate:……

8) Where do you prefer to perform your important job tasks? *

☐ On campus ☐ off campus

9) How many hours do you spend using the Internet per day?*

☐ Less than 2 hours ☐ 2-5 ☐ 6-9 ☐ More than 9 hours

10) Do you have a job through your study? *

☐ Yes, I work as full time ☐ Yes, I work as part time ☐ No, I have stopped my work to complete study

Section Two: About the performance of e-learning system in the higher education institutes in Libya

11) Do you use the university's Email access? *

☐ Sure ☐ Sometimes ☐ I don't have ☐ Not at all.

12) How do you contact the Academic staff and your supervisor? (Choose all that apply).*

☐ During lectures ☐ By using my private email

☐ During office hours ☐ By the internal email of the university/ school

☐ By appointment via the secretary

13) Do you think that the use of online resources or ICT have added value to your learning?

☐ Definitely ☐ Maybe ☐ I don't know ☐ Not at all

14) In your opinion, what should be included in the contents of e-courses? (Choose all that apply).

☐ Course's materials ☐ E-assessment ☐ Online discussion

☐ Reading list ☐ E-library ☐ Other, please indicate:……...

15) Please give your opinion about the following statements by ticking the appropriate box:

	Strongly Agree	Agree	I don't know	Disagree	Strongly Disagree
E-learning implementation will increase the efficiency of teaching.	☐	☐	☐	☐	☐
I support the implementation of e-learning in all HEIs in Libya.	☐	☐	☐	☐	☐
e-learning method is more flexible than the traditional methods.	☐	☐	☐	☐	☐
Blended learning should be adopted by all Libyan HEIs.	☐	☐	☐	☐	☐
E-learning should play an important role in curriculum development.	☐	☐	☐	☐	☐
E-learning can contribute in solving some educational problems (such as increasing the number of students, access to distance learning materials by disabled people, house wives, learners in remote places like desert areas, etc.)	☐	☐	☐	☐	☐
E-learning increases the students' motivation for learning.	☐	☐	☐	☐	☐
E-learning contributes to acquisition of IT skills.	☐	☐	☐	☐	☐
E-learning assists the students to better manage their time.	☐	☐	☐	☐	☐
E-learning encourages the students to learn other languages	☐	☐	☐	☐	☐

16) Which of the following do you consider as the most important element in achieving successful E-learning implementation in Libyan Higher Education Institutions? (Choose all that apply). *

☐ Development of ICT ☐ Financial support ☐ Activating e-courses

☐ Implementing the blended learning ☐ Developing a Blackboard Intranet
☐ Other, please indicate:……..

Section Three: Barriers to E-learning implementation in Libyan Higher Education

17) Which area creates the highest number of barriers to the practical implementation of E-learning systems in Libyan Higher Education?

☐ Technology ☐ Culture ☐ Mismanagement
☐ Other (please indicate):……..

18) In your opinion; which group has been most resistant to the E-learning implementation in Libyan Higher Education?*

☐ Administrative staff ☐ Students and researchers
☐ Government team ☐ Academic staff
☐ Technical staff ☐ Others (please indicate):……..

19) Are you satisfied with the Internet speed in your university campus?

☐ Strongly satisfied ☐ Satisfied ☐ I don't Know
☐ unsatisfied ☐ strongly unsatisfied

20) The cost of off-campus Internet access is:

☐ Highly expensive ☐ Expensive ☐ I don't know ☐ Normal ☐ Cheap

21) How many IT training courses have you attended in this academic year? *

☐ 1-2 courses ☐ 2-4 courses ☐ more than 4 courses ☐ No courses

22) Which resources (Audio/visual aids) are been used in the classroom? (Choose all that apply). *

☐ Chalk on board. ☐ Flip chart or Marker-board
☐ Projector ☐ Computer for presentation
☐ Internet connection by cable ☐ Internet wireless connection
☐ Smart board ☐ Other, please indicate:……

Section Four: Additional comments

Please include your personal views about any aspects related to the above mentioned questions or about the practical implementation of the e-learning systems in Libyan Higher Education.(this is optional section, just if you like add some comments or other opinions)

23) Write your additional Comments here:

……
……
……
……
……
……
……
……

Appendix B2: The Students' Questionnaire Results by English.

Student's views about the barriers to e-learning implementation in Libyan Higher Education

1. Section One: Personal Information

1. Age

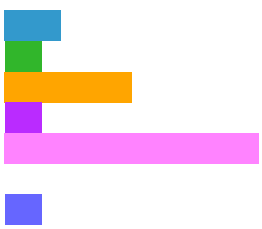
		Response Percent	Response Total
1	Less than 20 years	5.56%	2
2	21 -25 years	11.11%	4
3	26-30 years	19.44%	7
4	31- 35 years	30.56%	11
5	More than 35 years	33.33%	12
Analysis	Mean: 3.75 Std. Deviation: 1.19 Satisfaction Rate: 68.75	answered	36
	Variance: 1.41 Std. Error: 0.2	skipped	0

2. Gender

		Response Percent	Response Total
1	Male	58.33%	21
2	Female	41.67%	15
Analysis	Mean: 1.42 Std. Deviation: 0.49 Satisfaction Rate: 41.67	answered	36
	Variance: 0.24 Std. Error: 0.08	skipped	0

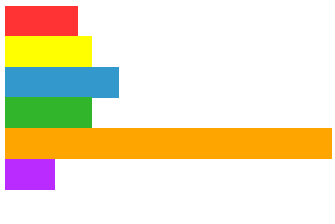
3. Current educational level:

		Response Percent	Response Total
1	Technical National Diploma (TND)	0.00%	0
2	Higher National Certificate (HNC)	0.00%	0
3	Baccalaureate (BEng/ BSc/ BA)	11.11%	4
4	Postgraduate Diploma	5.56%	2
5	Master degree (MSc)	25.00%	9
6	Master Philosophy degree (Mphil)	5.56%	2
7	Doctoral degree (PhD)	50.00%	18
8	Professor	0.00%	0
9	Other:	2.78%	1
Analysis	Mean: 5.89 Std. Deviation: 1.49 Satisfaction Rate: 61.11	answered	36
	Variance: 2.21 Std. Error: 0.25		



4. Last qualifications:

		Response Percent	Response Total
1	Technical National Diploma (TND)	16.67%	6
2	Higher National Certificate (HNC)	19.44%	7
3	Baccalaureate (BEng/ BSc/ BA)	25.00%	9
4	Postgraduate Diploma	19.44%	7
5	Master degree (MSc)	72.22%	26
6	Master Philosophy degree (MPhil)	11.11%	4
7	Doctoral degree (PhD)	0.00%	0
8	Professor	0.00%	0
9	Other:	2.78%	1
Analysis	Mean: 6.61 Std. Deviation: 4.01 Satisfaction Rate: 61.81	answered	36
	Variance: 16.04 Std. Error: 0.67	skipped	0

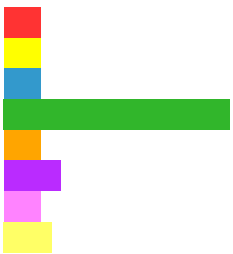


5. Do you study now?

		Response Percent	Response Total
1	Yes, as full time	86.11%	31
2	yes, as part time	5.56%	2
3	No, I have stopped my course	5.56%	2
4	No, I have completed my course	2.78%	1
Analysis	Mean: 1.25 Std. Deviation: 0.68 Satisfaction Rate: 8.33	answered	36
	Variance: 0.47 Std. Error: 0.11	skipped	0

6. In which school or faculty are you studying?

		Response Percent	Response Total
1	Science school	2.78%	1
2	Medical school	8.33%	3
3	Arts school	2.78%	1
4	Engineering school	52.78%	19
5	Education school	5.56%	2
6	Information Technology (IT) school	13.89%	5
7	Languages school	2.78%	1
8	Business school	11.11%	4
9	Other, please indicate:	0.00%	0
Analysis	Mean: 4.58 Std. Deviation: 1.71 Satisfaction Rate: 44.79	answered	36
	Variance: 2.91 Std. Error: 0.28	skipped	0



7. Where are you studying?

		Response Percent	Response Total
1	Libya	30.56%	11
2	UK	66.67%	24
3	Other country, please indicate:	2.78%	1
Analysis	Mean: 1.72 Std. Deviation: 0.51 Satisfaction Rate: 36.11	answered	36
	Variance: 0.26 Std. Error: 0.08	skipped	0

8. Where do you prefer to perform your important job tasks?

		Response Percent	Response Total
1	On campus	69.44%	25
2	Off campus	30.56%	11
Analysis	Mean: 1.31 Std. Deviation: 0.46 Satisfaction Rate: 30.56	answered	36
	Variance: 0.21 Std. Error: 0.08	skipped	0

9. How many hours do you spend using the Internet per day?

		Response Percent	Response Total
1	Less than 2 hours	8.33%	3
2	2-5	27.78%	10
3	6-9	47.22%	17
4	More than 9 hours	16.67%	6
Analysis	Mean: 2.72 Std. Deviation: 0.84 Satisfaction Rate: 57.41	answered	36
	Variance: 0.7 Std. Error: 0.14	skipped	0

10. Do you have a job through your study?

		Response Percent	Response Total
1	Yes, I work as full time	5.56%	2

10. Do you have a job through your study?

							Response Percent	Response Total
2	Yes, I work as part time						22.22%	8
3	No, I have stopped my work to complete study						72.22%	26
Analysis	Mean:	2.67	Std. Deviation:	0.58	Satisfaction Rate:	83.33	answered	36
	Variance:	0.33	Std. Error:	0.1			skipped	0

2. Section Two: About the performance of e-learning system in the higher education institutes in Libya

11. Do you use the university's Email access?

							Response Percent	Response Total
1	Sure						63.89%	23
2	Sometimes						11.11%	4
3	I don't have						16.67%	6
4	Not at all.						8.33%	3
Analysis	Mean:	1.69	Std. Deviation:	1.02	Satisfaction Rate:	23.15	answered	36
	Variance:	1.05	Std. Error:	0.17			skipped	0

12. How do you contact the Academic staff and your supervisor? (Choose all that apply).

							Response Percent	Response Total
1	During lectures						22.22%	8
2	By using my private email						33.33%	12
3	During office hours						63.89%	23
4	By the internal email of the university/ school						50.00%	18
5	By appointment via the secretary						16.67%	6
Analysis	Mean:	5.64	Std. Deviation:	3.88	Satisfaction Rate:	94.44	answered	36
	Variance:	15.06	Std. Error:	0.65			skipped	0

13. Do you think that the use of online resources or ICT have added value to your learning?

							Response Percent	Response Total
1	Definitely						86.11%	31
2	Maybe						8.33%	3
3	I don't know						5.56%	2
4	Not at all						0.00%	0
Analysis	Mean:	1.19	Std. Deviation:	0.52	Satisfaction Rate:	6.48	answered	36
	Variance:	0.27	Std. Error:	0.09			skipped	0

14. In your opinion, what should be included in the contents of e-courses? (Choose all that apply).

							Response Percent	Response Total
1	Course's materials						66.67%	24
2	E-assessment						44.44%	16
3	Online discussion						33.33%	12
4	Reading list						50.00%	18
5	E-library						50.00%	18
6	Other, please indicate:						2.78%	1
Analysis	Mean:	7.22	Std. Deviation:	7.18	Satisfaction Rate:	95	answered	36
	Variance:	51.58	Std. Error:	1.2			skipped	0

15. Please give your opinion about the following statements by ticking the appropriate box:

	Strongly Agree	Agree	I don't know	Disagree	Strongly Disagree	Response Total
E-learning implementation will increase the efficiency of teaching.	72.2% (26)	22.2% (8)	5.6% (2)	0.0% (0)	0.0% (0)	36
I support the implementation of e-learning in all HEIs in Libya.	66.7% (24)	30.6% (11)	0.0% (0)	2.8% (1)	0.0% (0)	36
e-learning method is more flexible than the traditional methods.	30.6% (11)	52.8% (19)	13.9% (5)	2.8% (1)	0.0% (0)	36
Blended learning should be adopted by all Libyan HEIs.	27.8% (10)	22.2% (8)	33.3% (12)	13.9% (5)	2.8% (1)	36
E-learning should play an important role in curriculum development.	33.3% (12)	50.0% (18)	11.1% (4)	5.6% (2)	0.0% (0)	36
E-learning can contribute in solving some educational problems (such as increasing the number of students, access to distance learning materials by disabled people, house wives, learners in remote places like desert areas, etc.)	44.4% (16)	47.2% (17)	5.6% (2)	2.8% (1)	0.0% (0)	36
E-learning increases the students' motivation for learning.	36.1% (13)	50.0% (18)	13.9% (5)	0.0% (0)	0.0% (0)	36
E-learning contributes to acquision of IT skills.	41.7% (15)	41.7% (15)	16.7% (6)	0.0% (0)	0.0% (0)	36
E-learning assists the students to better manage their time.	38.9% (14)	44.4% (16)	8.3% (3)	8.3% (3)	0.0% (0)	36
E-learning encourages the students to learn other languages	38.9% (14)	33.3% (12)	27.8% (10)	0.0% (0)	0.0% (0)	36
					answered	36
					skipped	0

Matrix Charts

15.1. E-learning implementation will increase the efficiency of teaching.

		Response Percent	Response Total
1	Strongly Agree	72.2%	26
2	Agree	22.2%	8
3	I don't know	5.6%	2
4	Disagree	0.0%	0
5	Strongly Disagree	0.0%	0
Analysis	Mean: 1.33 Std. Deviation: 0.58 Satisfaction Rate: 8.33	answered	36
	Variance: 0.33 Std. Error: 0.1		

15.2. I support the implementation of e-learning in all HEIs in Libya.

		Response Percent	Response Total
1	Strongly Agree	66.7%	24
2	Agree	30.6%	11
3	I don't know	0.0%	0
4	Disagree	2.8%	1
5	Strongly Disagree	0.0%	0

15.2. I support the implementation of e-learning in all HEIs in Libya.

							Response Percent	Response Total
Analysis	Mean:	1.39	Std. Deviation:	0.64	Satisfaction Rate:	9.72	answered	36
	Variance:	0.4	Std. Error:	0.11				

15.3. e-learning method is more flexible than the traditional methods.

							Response Percent	Response Total
1	Strongly Agree						30.6%	11
2	Agree						52.8%	19
3	I don't know						13.9%	5
4	Disagree						2.8%	1
5	Strongly Disagree						0.0%	0
Analysis	Mean:	1.89	Std. Deviation:	0.74	Satisfaction Rate:	22.22	answered	36
	Variance:	0.54	Std. Error:	0.12				

15.4. Blended learning should be adopted by all Libyan HEIs.

							Response Percent	Response Total
1	Strongly Agree						27.8%	10
2	Agree						22.2%	8
3	I don't know						33.3%	12
4	Disagree						13.9%	5
5	Strongly Disagree						2.8%	1
Analysis	Mean:	2.42	Std. Deviation:	1.11	Satisfaction Rate:	35.42	answered	36
	Variance:	1.24	Std. Error:	0.19				

15.5. E-learning should play an important role in curriculum development.

							Response Percent	Response Total
1	Strongly Agree						33.3%	12
2	Agree						50.0%	18
3	I don't know						11.1%	4
4	Disagree						5.6%	2
5	Strongly Disagree						0.0%	0
Analysis	Mean:	1.89	Std. Deviation:	0.81	Satisfaction Rate:	22.22	answered	36
	Variance:	0.65	Std. Error:	0.13				

15.6. E-learning can contribute in solving some educational problems (such as increasing the number of students, access to distance learning materials by disabled people, house wives, learners in remote places like desert areas, etc.)

							Response Percent	Response Total
1	Strongly Agree						44.4%	16
2	Agree						47.2%	17
3	I don't know						5.6%	2
4	Disagree						2.8%	1
5	Strongly Disagree						0.0%	0
Analysis	Mean:	1.67	Std. Deviation:	0.71	Satisfaction Rate:	16.67	answered	36
	Variance:	0.5	Std. Error:	0.12				

15.7. E-learning increases the students' motivation for learning.

							Response Percent	Response Total
1	Strongly Agree						36.1%	13
2	Agree						50.0%	18
3	I don't know						13.9%	5
4	Disagree						0.0%	0
5	Strongly Disagree						0.0%	0
Analysis	Mean:	1.78	Std. Deviation:	0.67	Satisfaction Rate:	19.44	answered	36
	Variance:	0.45	Std. Error:	0.11				

15.8. E-learning contributes to acquision of IT skills.

		Response Percent	Response Total
1	Strongly Agree	41.7%	15
2	Agree	41.7%	15
3	I don't know	16.7%	6
4	Disagree	0.0%	0
5	Strongly Disagree	0.0%	0

15.8. E-learning contributes to acquision of IT skills.

							Response Percent	Response Total
Analysis	Mean:	1.75	Std. Deviation:	0.72	Satisfaction Rate:	18.75	answered	36
	Variance:	0.52	Std. Error:	0.12				

15.9. E-learning assists the students to better manage their time.

							Response Percent	Response Total
1			Strongly Agree				38.9%	14
2			Agree				44.4%	16
3			I don't know				8.3%	3
4			Disagree				8.3%	3
5			Strongly Disagree				0.0%	0
Analysis	Mean:	1.86	Std. Deviation:	0.89	Satisfaction Rate:	21.53	answered	36
	Variance:	0.79	Std. Error:	0.15				

15.10. E-learning encourages the students to learn other languages

							Response Percent	Response Total
1			Strongly Agree				38.9%	14
2			Agree				33.3%	12
3			I don't know				27.8%	10
4			Disagree				0.0%	0
5			Strongly Disagree				0.0%	0
Analysis	Mean:	1.89	Std. Deviation:	0.81	Satisfaction Rate:	22.22	answered	36
	Variance:	0.65	Std. Error:	0.13				

16. Which of the following do you consider as the most important element in achieving successful E-learning implementation in Libyan Higher Education Institutions? (Choose all that apply).

							Response Percent	Response Total
1			Development of ICT				69.44%	25
2			Financial support				44.44%	16
3			Activating e-courses				36.11%	13
4			Implementing the blended learning				19.44%	7
5			Developing a Blackboard Intranet				55.56%	20
6			Other, please indicate:				0.00%	0
Analysis	Mean:	6.22	Std. Deviation:	5.69	Satisfaction Rate:	79.44	answered	36
	Variance:	32.4	Std. Error:	0.95			skipped	0

3. Section Three: Barriers to E-learning implementation in Libyan Higher Education

17. Which area creates the highest number of barriers to the practical implementation of E-learning systems in Libyan Higher Education?

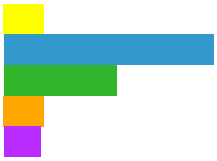
							Response Percent	Response Total
1	Technology						41.67%	15
2	Culture						19.44%	7
3	Mismanagement						36.11%	13
4	Other (please indicate):						2.78%	1
Analysis	Mean:	2	Std. Deviation:	0.94	Satisfaction Rate:	33.33	answered	36
	Variance:	0.89	Std. Error:	0.16			skipped	0

18. In your opinion; which group has been most resistant to the E-learning implementation in Libyan Higher Education?

		Response Percent	Response Total
1	Administrative staff	16.67%	6

18. In your opinion; which group has been most resistant to the E-learning implementation in Libyan Higher Education?

		Response Percent	Response Total
2	Students and researchers	8.33%	3
3	Government team	41.67%	15
4	Academic staff	22.22%	8
5	Technical staff	8.33%	3
6	Others (please indicate):	2.78%	1
Analysis	Mean: 3.06 Std. Deviation: 1.25 Satisfaction Rate: 41.11	answered	36
	Variance: 1.55 Std. Error: 0.21	skipped	0

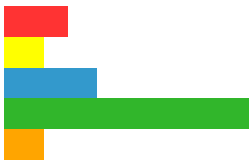


19. Are you satisfied with the Internet speed in your university campus?

		Response Percent	Response Total
1	Strongly satisfied	36.11%	13
2	satisfied	36.11%	13
3	I don't Know	2.78%	1
4	unsatisfied	8.33%	3
5	Strongly unsatisfied	16.67%	6
Analysis	Mean: 2.33 Std. Deviation: 1.45 Satisfaction Rate: 33.33	answered	36
	Variance: 2.11 Std. Error: 0.24	skipped	0

20. The cost of off-campus Internet access is:

		Response Percent	Response Total
1	Highly expensive	13.89%	5
2	Expensive	8.33%	3
3	I don't know	19.44%	7
4	Normal	50.00%	18
5	Cheap	8.33%	3
Analysis	Mean: 3.31 Std. Deviation: 1.17 Satisfaction Rate: 57.64	answered	36
	Variance: 1.38 Std. Error: 0.2	skipped	0



21. How many IT training courses have you attended in this academic year?

		Response Percent	Response Total
1	1-2 courses	22.22%	8
2	2-4 courses	11.11%	4
3	More than 4 courses	13.89%	5
4	No courses	52.78%	19
Analysis	Mean: 2.97 Std. Deviation: 1.24 Satisfaction Rate: 65.74	answered	36
	Variance: 1.53 Std. Error: 0.21	skipped	0

22. Which resources (Audio/visual aids) are been used in the classroom? (Choose all that apply).

		Response Percent	Response Total
1	Chalk on board.	25.00%	9
2	Flip chart or Marker-board	30.56%	11
3	Projector	44.44%	16
4	Computer for presentation	36.11%	13
5	Internet connection by cable	33.33%	12
6	Internet wireless connection	50.00%	18
7	Smart board	25.00%	9
8	Other, please indicate:	0.00%	0
Analysis	Mean: 10.06 Std. Deviation: 9.74 Satisfaction Rate: 108.73	answered	36

22. Which resources (Audio/visual aids) are been used in the classroom? (Choose all that apply).

				Response Percent	Response Total
Variance:	94.77	Std. Error:	1.62	skipped	0

4. Section Four: Additional comments

23. Write your additional Comments here:

		Response Percent	Response Total
1	Open-Ended Question	100.00%	15

1	16/3/15 11:17PM ID: 4523867	Nothing to add
2	16/3/15 11:17PM ID: 5077433	No comments
3	16/3/15 11:17PM ID: 5079113	There should be blended e-learning with traditional learning in higher education to improve and development of learning and teaching process in L IBYA.
4	16/3/15 11:17PM I5125557	Good luck
5	16/3/15 11:17PM ID: 6115755	What is available here in the UK is not available backhome.Comparsion is difficult to be carried.
6	16/3/15 11:17PM ID: 6306600	I think the main difficulty behind any development in our country, is the mentality of some people. But, It is just difficulty NOT impossibility.
7	16/3/15 11:17PM ID: 6376550	just to say that your project will make a good contribution in development of our learning techniques and getting a good education in an appropriate way.
8	16/3/15 11:17PM ID: 6377570	I strongly support the e-learning to be implemented in our country (libya) asapart of higher education program to help the people who are in need to this service.
9	166381287	
10	16/3/15 11:17PM ID: 6382923	I hope all my answer for all your question will be help, i wish thest for you.
11	16/3/15 11:17PM ID: 6411496	One of the most barriers to e-learning implementation in Libyan Higher Education is the sector of Higher Education still follows the traditional education ways and also students don't have enough experience to use e-sources. Higher Education should take some more serious steps to improve the education such as changing the traditional ways for learning and implement more practical work, instead of just focusing in the theoretical work. This in general, but we can be more specific and start searching about the useful ways for using the internet in our education, and then we can turn to using e-learning.
12	16/3/15 11:17PM ID: 8726232	is the e-learning has side effect in the culture , is there any privies study in this field
13	16/3/15 11:17PM ID: 9574149	I would like to pay attention to improve e-learning in Libya
14	16/3/15 11:17PM ID: 10726515	YYY
15	16/3/15 11:17PM ID: 13261161	The most important factor that affect the development of E-Learning is the culture of both, staff members and students.

answered	15
skipped	21

Appendix B3: The Students' Questionnaire Results by Arabic.

(Questionnaire2 by Arabic language)*الاستبيان هذا ـليبيا في العالي التعليم مؤسسات في الالكتروني التعليم تنفيذ عملية تواجه التي الصعوبات حول إستبيان*
والباحثين للطلبة مخصص
يواجهها التي والصعوبات له الفعلي الواقع بعرض وذلك ,الالكتروني التعليم أداء لتحسين الاستبيان هذا يهدف

1. العامة المعلومات **:**الأول الجزء

1. عمرك؟ تدرج أن يمكن الأتية المجموعات من مجموعة أي في				
			Response Percent	Response Total
1	سنة 20 الـــ من أقل		10.45%	7
2	سنة 21-25 من		32.84%	22
3	سنة 26-30 من		23.88%	16
4	سنة 31-35 من		19.40%	13
5	سنة 35 من أكبر		13.43%	9
			answered	67
			skipped	0

2. أنت هل ؟				
			Response Percent	Response Total
1	ذكر		64.18%	43
2	أنثى		35.82%	24
			answered	67
			skipped	0

3. ا -:الحالي التعليمي المؤهل				
			Response Percent	Response Total
1	تقني معهد -دبلوم		0.00%	0
2	عالي معهد		1.49%	1
3	بكالوريوس		35.82%	24
4	عالي دبلوم		4.48%	3
5	ماجستير		43.28%	29
6	إمفيل		1.49%	1
7	دكتوراة		11.94%	8
8	بروفوسور		0.00%	0
9	هنا أضفها رجاءَ - ذلك غير :		1.49%	1
			answered	67
			skipped	0

3. ا -:الحالي التعليمي المؤهل	Response Percent	Response Total

4. ا -:السابقة التعليمية المؤهلات			Response Percent	Response Total
1	تقني معهد		58.21%	39
2	عالي معهد		61.19%	41
3	بكالوريوس		62.69%	42
4	عالي دبلوم		19.40%	13
5	ماجستير		14.93%	10
6	إمفيل		0.00%	0
7	دكتوراة		0.00%	0
8	بروفوسور		0.00%	0
9	هنا أضفها رجاءً ,أخرى شهادة:		2.99%	2
			answered	67
			skipped	0

5. حالياً؟ تدرس أنت هل		Response Percent	Response Total
1	كامل وبدوام ,نعم		73.13%	49
2	جزئي وبدوام ,نعم		13.43%	9
3	الفصل لهذا دراستي أوقفت,لا		7.46%	5
4	دراستي أكملت لقد ,لا		5.97%	4
			answered	67
			skipped	0

6. تدرس؟ أنت كلية اي في		Response Percent	Response Total
1	العلوم كلية		2.99%	2
2	الطبية العلوم كلية		7.46%	5
3	الفنون كلية		1.49%	1
4	الهندسة كلية		76.12%	51
5	والتعليم التربية كلية		0.00%	0
6	المعلومات تقنية كلية		7.46%	5
7	اللغات كلية		1.49%	1
8	الاقتصاد كلية		2.99%	2
9	أخرى كلية:إدرجها رجاءَ - -		0.00%	0

6. تدرس؟ أنت كلية اي في			Response Percent	Response Total
			answered	67
			skipped	0

7. فيه؟ تدرس أنت بلد أي			Response Percent	Response Total
1	ليبيا		82.09%	55
2	بريطانيا		17.91%	12
3	أضفها رجاءً , أخرى دولة:		0.00%	0
			answered	67
			skipped	0

8. المهمة؟ الدراسية ومهماتك واجباتك أداء تفضل أين			Response Percent	Response Total
1	الجامعي الحرم داخل		29.85%	20
2	الجامعي الحرم خارج		70.15%	47
			answered	67
			skipped	0

9. الواحد؟ اليوم في الانترنت مستخدما تقضيها التي الساعات عدد يتراوح كم			Response Percent	Response Total
1	ساعتين- 2 من أقل		19.40%	13
2	يوميا 5-2 من		47.76%	32
3	يوميا 9-6 من		28.36%	19
4	ساعات 9 من أكثر		4.48%	3
			answered	67
			skipped	0

10. دراستك؟ فترة خلال تعمل أنت هل			Response Percent	Response Total
1	كامل بدوام أعمل , نعم		4.48%	3
2	جزئي بدوام أعمل, نعم		41.79%	28
3	دراستي لأكمال العمل أوقفت, لا		53.73%	36
			answered	67
			skipped	0

الدراسة نظام حول :الثاني الجزء **2.**

11. بالجامعة؟ الخاص الإيميل أو الإلكتروني البريد تستخدم هل			Response Percent	Response Total
1	ومنتظم دائم بشكل- نعم		14.93%	10
2	أحيانا		16.42%	11
3	الايميل أو البريد هذا أملك لا		49.25%	33
4	أبدا استخدمه لا		19.40%	13
			answered	67
			skipped	0

12. ا-:(إجابة من أكثر اختيار يمكنك) دراستك؟ على المشرف والأستاذ بالأساتذة تتصل كيف			Response Percent	Response Total
1	والدرس المحاضرات خلال		70.15%	47
2	الخاص الالكتروني البريد طريق عن		31.34%	21
3	المكتبية العمل ساعات خلال		41.79%	28
4	والخاص الداخلي الالكتروني البريد طريق عن بالجامعة		14.93%	10
5	القسم سكريتاريا طريق عن موعد تحديد		17.91%	12
			answered	67
			skipped	0

13. لتعلمك؟ قيمة ستضيف - متكاملة كمنظومة والاتصالات المعلومات وتقنية الانترنت مصادر أن تعتقد هل			Response Percent	Response Total
1	نعم		82.09%	55
2	قليلا		14.93%	10
3	أعرف لا		2.99%	2
4	لا		0.00%	0
			answered	67
			skipped	0

14. ا-:(إجابة من أكثر اختيار يمكنك) ما؟ لمادة الالكتروني المنهج يحتويه أن يجب الذي ما :نظرك وجهة حسب			Response Percent	Response Total
1	المادة منهج		71.64%	48
2	الالكتروني الاختبار		37.31%	25
3	الانترنت شبكة عبر المفتوح النقاش		55.22%	37
4	والتي المساعدة والبحوث الكتب بأسماء قائمة دراستها يجب		37.31%	25

14. نظرك وجهة حسب :الذي ما يجب أن ينبغي المنهج يحتويه الذي (إجابة من أكثر اختيار يمكنك) ما؟ لمادة الالكتروني ا-:			Response Percent	Response Total
5	عالمية علمية الكترونية مكتبة		85.07%	57
6	اذكرها رجاءً : أخرى أشياء		0.00%	0
			answered	67
			skipped	0

15. ؟ التالية العبارات في رأيك هو ما	أوافق بشدة	أوافق	لا أعرف	أوافق لا	أوافق لا بشدة	Response Total
التعليم فاعلية في يزيد سوف الالكتروني التعليم تنفيذ	37.3% (25)	53.7% (36)	3.0% (2)	4.5% (3)	1.5% (1)	67
العالي التعليم مؤسسات كل في الالكتروني التعليم تنفيذ ادعم أنا ليبيا في	31.3% (21)	47.8% (32)	14.9% (10)	3.0% (2)	3.0% (2)	67
التقليدية الطريقة من مرونة اكثر تكون الالكتروني التعليم طريقة التعليم في	20.9% (14)	49.3% (33)	17.9% (12)	10.4% (7)	1.5% (1)	67
كل في يعتمد أن يجب - والتقليدي الالكتروني-المزدوج التعليم الليبي العالي التعليم مؤسسات	23.9% (16)	49.3% (33)	19.4% (13)	6.0% (4)	1.5% (1)	67
المناهج تطوير في مهم دور يلعب الالكتروني التعليم	34.3% (23)	50.7% (34)	10.4% (7)	3.0% (2)	1.5% (1)	67
عدد كزيادة - التعليم مشاكل حل في يساهم الالكتروني التعليم البيوت وربات الخاصة الحاجات ذوي وتعليم الطلبة	38.8% (26)	40.3% (27)	16.4% (11)	3.0% (2)	1.5% (1)	67
الطلبة لدى الابداع قدرات من يزيد الالكتروني التعليم	28.4% (19)	41.8% (28)	23.9% (16)	4.5% (3)	1.5% (1)	67
متجددة تقنية مهارات الطلبة يكسب الالكتروني التعليم	38.8% (26)	43.3% (29)	13.4% (9)	3.0% (2)	1.5% (1)	67
أفضل بشكل وقتهم إدارة على الطلبة يساعد الالكتروني التعليم	26.9% (18)	43.3% (29)	13.4% (9)	14.9% (10)	1.5% (1)	67
أخرى لغات كسب على الطلبة يشجع الالكتروني التعليم	34.3% (23)	43.3% (29)	14.9% (10)	6.0% (4)	1.5% (1)	67
					answered	67
					skipped	0

Matrix Charts

15.1. التعليم فاعلية في يزيد سوف الالكتروني التعليم تنفيذ			Response Percent	Response Total
1	بشدة أوافق		37.3%	25
2	أوافق		53.7%	36
3	أعرف لا		3.0%	2
4	أوافق لا		4.5%	3
5	بشدة أوافق لا		1.5%	1
			answered	67

15.2. ليبيا في العالي التعليم مؤسسات كل في الالكتروني التعليم تنفيذ ادعم أنا			Response Percent	Response Total
1	بشدة أوافق		31.3%	21
2	أوافق		47.8%	32
3	أعرف لا		14.9%	10
4	أوافق لا		3.0%	2
5	بشدة أوافق لا		3.0%	2
			answered	67

15.3. التعليم في التقليدية الطريقة من مرونة اكثر تكون الالكتروني التعليم طريقة			Response Percent	Response Total
1	بشدة أوافق		20.9%	14
2	أوافق		49.3%	33
3	أعرف لا		17.9%	12
4	أوافق لا		10.4%	7
5	بشدة أوافق لا		1.5%	1
			answered	67

15.4. الليبي العالي التعليم مؤسسات كل في يعتمد أن يجب - والتقليدي الالكتروني-المزدوج التعليم			Response Percent	Response Total
1	بشدة أوافق		23.9%	16
2	أوافق		49.3%	33
3	أعرف لا		19.4%	13
4	أوافق لا		6.0%	4
5	بشدة أوافق لا		1.5%	1
			answered	67

15.5. المناهج تطوير في مهم دور يلعب الالكتروني التعليم			Response Percent	Response Total
1	بشدة أوافق		34.3%	23
2	أوافق		50.7%	34
3	أعرف لا		10.4%	7
4	أوافق لا		3.0%	2
5	بشدة أوافق لا		1.5%	1
			answered	67

15.6. وربات الخاصة الحاجات ذوي وتعليم الطلبة عدد كزيادة - التعليم مشاكل حل في يساهم الالكتروني التعليم البيوت			Response Percent	Response Total
1	بشدة أوافق		38.8%	26
2	أوافق		40.3%	27
3	أعرف لا		16.4%	11
4	أوافق لا		3.0%	2
5	بشدة أوافق لا		1.5%	1

15.6. وربات الخاصة الحاجات ذوي وتعليم الطلبة عدد كزيادة - التعليم مشاكل حل في يساهم الالكتروني التعليم البيوت		Response Percent	Response Total
		answered	67

15.7. الطلبة لدى الابداع قدرات من يزيد الالكتروني التعليم			Response Percent	Response Total
1	بشدة أوافق		28.4%	19
2	أوافق		41.8%	28
3	أعرف لا		23.9%	16
4	أوافق لا		4.5%	3
5	بشدة أوافق لا		1.5%	1
			answered	67

15.8. متجددة تقنية مهارات الطلبة يكسب الالكتروني التعليم			Response Percent	Response Total
1	بشدة أوافق		38.8%	26
2	أوافق		43.3%	29
3	أعرف لا		13.4%	9
4	أوافق لا		3.0%	2
5	بشدة أوافق لا		1.5%	1
			answered	67

15.9. أفضل بشكل وقتهم إدارة على الطلبة يساعد الالكتروني التعليم			Response Percent	Response Total
1	بشدة أوافق		26.9%	18
2	أوافق		43.3%	29
3	أعرف لا		13.4%	9
4	أوافق لا		14.9%	10
5	بشدة أوافق لا		1.5%	1
			answered	67

15.10. أخرى لغات كسب على الطلبة يشجع الالكتروني التعليم			Response Percent	Response Total
1	بشدة أوافق		34.3%	23
2	أوافق		43.3%	29
3	أعرف لا		14.9%	10
4	أوافق لا		6.0%	4
5	بشدة أوافق لا		1.5%	1
			answered	67

16. (إجابة من أكثر اختيار يمكنك) ليبيا؟ في العالي التعليم مؤسسات في ناجح إلكتروني تعليم لإنجاز أهمية الأكثر العنصر يعتبر الآتي من أي :				
			Response Percent	Response Total
1	(ICT) والتقنية للإتصالات التحتية البنية تطوير		92.54%	62

16. في العالي التعليم مؤسسات في ناجح إلكتروني تعليم لإنجاز أهمية الأكثر العنصر يعتبر الآتي من أي (إجابة من أكثر اختيار يمكنك) ليبيا؟ :				
			Response Percent	Response Total
2	المالي أو المادي الدعم		41.79%	28
3	التفاعل على تعتمد التي (الرقمية المناهج) تفعيل الالكتروني		41.79%	28
4	واعتماده المزدوج التعليم تنفيذ		44.78%	30
5	والخاصة الداخلية الالكترونية المنظومة تطوير جامعة لكل		73.13%	49
6	هنا أضفه رجاءأ- أخر شيء:		1.49%	1
			answered	67
			skipped	0

3. الثالث الجزء: ليبيا في العالي التعليم مؤسسات في الالكتروني التعليم تنفيذ تعيق التي والصعوبات الموانع

17. في العالي التعليم مؤسسات في الالكتروني التعليم نظام لتنفيذ الأكبر المانع أو الصعوبة تتمثل :التالية المجالات من مجال أي في ليبيا؟				
			Response Percent	Response Total
1	ليبيا في الحالية التكنولوجيا أو التقنية		28.36%	19
2	الثقافة		8.96%	6
3	الإدارة سوء		62.69%	42
			answered	67
			skipped	0

(1) هنا إضافته يمكنك :آخر شيء			
	1	16/11/12 7:34PM ID: 5079920	المجال هدا في الدولة سياسة

18. في العالي التعليم مؤسسات في الالكتروني التعليم لتنفيذ مقاومة الأكثر تعتبر - التالية المجموعات من مجموعة أي ليبيا؟				
			Response Percent	Response Total
1	الإداري الطاقم		40.30%	27
2	والباحثون الطلبة		2.99%	2
3	المسؤولة الحكومية الجهة		41.79%	28
4	التدريس هيئة وأعضاء الأكاديميين		10.45%	7
5	والفنيين التقنيين		1.49%	1
6	إضافتها يمكنك :أخرى مجموعة		2.99%	2
			answered	67
			skipped	0

19. الجامعي؟ الحرم في (الإنترنت) أداء سرعة على راضي أنت هل			Response Percent	Response Total
1	وبقوة راضي		7.46%	5
2	راضي		17.91%	12
3	أعرف لا		10.45%	7
4	راضي غير		41.79%	28
5	وبقوة راضي غير		22.39%	15
			answered	67
			skipped	0

20. تعتبر؟ الجامعي الحرم خارج (الانترنت) خدمات في الاشتراك سعر			Response Percent	Response Total
1	جداً باهضة		11.94%	8
2	الشيء بعض باهضة		47.76%	32
3	أعرف لا		2.99%	2
4	ومعقولة مقبولة		35.82%	24
5	رخيصة		1.49%	1
			answered	67
			skipped	0

21. السنة؟ هذه خلال المعلومات تقنية على بالتدرب تتعلق تدريبية دورة حضرت كم			Response Percent	Response Total
1	إثنين أو دورة		40.30%	27
2	دورات أربعة أو ثلاثة		2.99%	2
3	دورات ٤ من أكثر		4.48%	3
4	دورة أي أحضر لم		52.24%	35
			answered	67
			skipped	0

22. ا-:(إجابة من أكثر اختيار يمكنك) الدرس؟ حجرة في للإستخدام المتاحة والبصرية السمعية الوسائل هي ما			Response Percent	Response Total
1	والطباشير السبورة		4.48%	3
2	يكتب التي البيضاء السبورة أو ورقية لوحات الملونة الخطاط بأقلام عليها		77.61%	52
3	البروجكتر - العرض جهاز		53.73%	36
4	حاسوب		47.76%	32
5	كابل-للإنترنت وصلة		5.97%	4

22. ا-:(إجابة من أكثر اختيار يمكنك) الدرس؟ حجرة في للإستخدام المتاحة والبصرية السمعية الوسائل هي ما				
			Response Percent	Response Total
6	لاسلكي-للإنترنت وصلة		14.93%	10
7	الذكية السبورة		5.97%	4
8	هنا أضفها - أخرى أشياء		0.00%	0
			answered	67
			skipped	0

5. أخرى إضافات :الرابع الجزء

23. هنا إضافتك أكتب				
			Response Percent	Response Total
1	Open-Ended Question		100.00%	9
	1	16/11/12 7:34PM ID: 5079920	بالنسبة عالية اهمية دات وتعتبر الخاص حسابي على كانت فيها اشتركت التي الدورات كل 21 للسؤال بالنسبة افضل بشكل الدورات هده على الحصول في يساعد الالكتروني التعليم تنفيد ان واعتقد الجامعية لدراستي وارخص	
	2	09/04/13 7:50PM ID: 6306597	الانسان بناء في يكمن ليبيا في الاصعب التحدي ان اعتقد تطويرية خطة اي عند حاجز ستكون البعض عقلية لتوفيق وليّ والله ... حاجز مجرد	
	3	17/04/13 6:39PM ID: 6376485	N/A	
	4	18/04/13 10:30AM ID: 6381346	N/A	
	5	18/04/13 10:29PM ID: 6388175	الالكترونية للتقنية داعم اهم هي الاتصالات ووسرعة جودة ان هو بشدة اضيفة ما	
	6	20/04/13 1:32AM ID: 6398510	NO thing	
	7	19/11/14 1:48PM ID: 13262021	/	
	8	19/01/15 1:19PM ID: 14365247	يفضل لا منهم;quot&; الاستاذ تعاون جسب وهذا .. بيننا فيما التواصل في الخاص الالكتروني البريد نستخدم ذلك"	
	9	22/01/15 2:40PM ID: 14448709	the time for use the internet .... I have write less than 2 hours, because of the problems of the electricity in my city and the engineering school in Tripoli university.	
			answered	9
			skipped	58

Appendix C

Appendix C1: The Technicians' Questionnaire (Q3/English)

The questionnaires of Technician's view the barriers to e-learning implementation in Engineering School at Tripoli University.
The aim of this questionnaire: to investigate the barriers to e-learning implementation.
Your feedback will be very helpful for me in order to obtain the required data from the participants of the study.
"The information gathered from this questionnaire will be used only on scholarly purposes."

Section One: Personal Information

1) Age

☐ Less than 25 years ☐ 26 -30 years ☐ 31- 35 years ☐ More than 35 years

2) Gender

☐ Male ☐ Female

3) Your qualifications: (choose all that apply)

☐ Technical National Diploma (TND) ☐ Higher National Certificate (HNC)
☐ Postgraduate Diploma ☐ Baccalaureate (BEng/ BSc/ BA)
☐ Master degree (MSc) ☐ Master Phil degree (MPhil)
☐ Other, please indicate:……

4) In which school or faculty do you work? (Choose all that apply) *

☐ Science school ☐ Medical school ☐ Arts school
☐ Engineering school ☐ Education school ☐ Information Technology (IT) school
☐ Languages school ☐ Business school ☐ Other, please indicate:……

5) What is your job role?

☐ Technician supporting networks ☐ Help desk technician ☐ Programmer of software
☐ Designer of web pages ☐ Controller and observer ☐ Technical trainer
☐ Other, please specify:……

6) How long have you been working in this job?

☐ 1-2 years ☐ 3-4 ☐ 5-6 ☐ 6-7 ☐ More than 7 years

Section Two: About the performance of e-learning system

7) Do you use the university's Email access? *

☐ Yes, regularly ☐ sometimes ☐ I don't have this access ☐ Not at all.

8) Do you work as a team when solving the technical problems? *

☐ Always ☐ Usually ☐ Sometimes ☐ Rarely ☐ Not at all

9) Do you work with a systemic strategy plan?

☐ Weekly ☐ Monthly ☐ Annually ☐ From time to time ☐ Not at all

10) What are the needs of ICT Department when developing a Blackboard system? (Choose all that apply)

☐ Personal skills of technicians.
☐ Technical staff to work as a team.
☐ Increase the speed of accessing Blackboard.
☐ Strategy plan from managers or the management team.
☐ Totally renew Blackboard system.
☐ Other, please indicate:……..

11) What is your opinion about the link between the performance of ICT system and people who are in managerial positions?

Please give your opinion about the following statements by ticking the appropriate box:

	Strongly Agree	Agree	I don't know	Disagree	Strongly Disagree
The performance of internal or intranet university network is good.	☐	☐	☐	☐	☐
There is strong relationship between the management structure and successful technician work.	☐	☐	☐	☐	☐
The management teams should formulate clear strategy to the technical staff.	☐	☐	☐	☐	☐
The management team should have total responsibility to archive the Blackboard content.	☐	☐	☐	☐	☐
The development of Blackboard system depends only on the management teams.	☐	☐	☐	☐	☐

12) Which of the following do you consider as the most important element to achieve a successful E-learning implementation in Libyan Higher Education Institutions? (Choose all that apply)

☐ Development of ICT ☐ Financial support ☐ Activating e-courses
☐ Imposing the blended learning ☐ Developing a Black Broad Intranet ☐ Other, please indicate:……

13) What is your opinion about these factors which affect the performance of Blackboard system? *

	Strongly Agree	Agree	I don't Know	Disagree	Strongly disagree
Tasks related to Blackboard system require the technical teams to work together.	☐	☐	☐	☐	☐
Updating the Blackboard system needs to be done step by step.	☐	☐	☐	☐	☐
The quality of Blackboard implementation depends on the personal skills of the technicians.	☐	☐	☐	☐	☐
The technical training should be done by the ICT department.	☐	☐	☐	☐	☐

Section Three: Barriers to E-learning implementation in Libyan Higher Education

14) Which area contains the highest number of barriers for the practical implementation of E-learning systems in Libyan Higher Education?

☐ Technological ☐ Cultural ☐ Mismanagemental

☐ Other (please indicated):……

15) In your opinion; which group has been the most resistant to the E-learning implementation in Libyan Higher Education?

☐ Administrative staff ☐ Students and researchers ☐ Government team ☐ Academic staff

☐ Technical staff ☐ Others (please indicate):……..

16) Are you satisfied with the Internet speed in your university campus?

☐ Strongly satisfied ☐ Satisfied ☐ I don't know

☐ Unsatisfied ☐ strongly unsatisfied

17) The cost of off-campus Internet access is: *

☐ Highly expensive ☐ Expensive ☐ I Don't know ☐ Normal ☐ Cheap

18) How many IT training courses have you attended in this academic year? *

☐ 1-2 courses ☐ 2-4 courses ☐ more than 4 courses ☐ No courses

19) Which resources (Audio/visual aids) are been used in the classroom? (Choose all that apply) *

☐ Chalk on board. ☐ Flip chart or Marker-board ☐ Projector

☐ Computer for presentation ☐ Internet connection by cable

☐ Internet wireless connection ☐ Smart board ☐ Other, please indicate:……

Section Four: Additional comments

Please include your personal views about any aspects related to the above mentioned questions or about the practical implementation of the e-learning systems in Libyan Higher Education.(this is optional section, just if you like add some comments or other opinions)

20) Write you're additional Comments here:

……
……
……
……
……
……
……

Appendix C2: The Technicians' Questionnaire Results by English.

The results of Technicians views about the barriers to e-learning implementation in Libyan Higher Education. The aim of this questionnaire to investigate the barriers to e-learning implementation.

Section One: Personal Information

1. Age

		Response Percent	Response Total
1	Less than 25 years	0.00%	0
2	26 -30 years	16.67%	1
3	31- 35 years	33.33%	2
4	More than 35 years	50.00%	3
Analysis	Mean: 3.333 Std. Deviation: 0.745	Answered	6
	Variance: 0.556 Std. Error: 0.304	Skipped	0

2. Gender

		Response Percent	Response Total
1	Male	66.67%	4
2	Female	33.33%	2
Analysis	Mean: 1.333 Std. Deviation: 0.471	answered	6
	Variance: 0.222 Std. Error: 0.192	skipped	0

3. Your qualifications: (choose all that apply)

		Response Percent	Response Total
1	Technical National Diploma (TND)	16.67%	1
2	Higher National Certificate (HNC)	0.00%	0
3	Postgraduate Diploma	0.00%	0
4	Baccalaureate (BEng/ BSc/ BA)	0.00%	0
5	Master degree (MSc)	66.67%	4
6	Master Phil degree (MPhil)	0.00%	0
7	Other:	16.67%	1
Analysis	Mean: 4.667 Std. Deviation: 1.795	answered	6
	Variance: 3.222 Std. Error: 0.733	skipped	0

4. In which school or faculty do you work? (choose all that apply)

		Response Percent	Response Total
1	Science school	16.67%	1
2	Medical school	0.00%	0
3	Arts school	16.67%	1
4	Engineering school	50.00%	3
5	Education school	33.33%	2
6	Information Technology (IT) school	16.67%	1
7	Languages school	0.00%	0
8	Business school	16.67%	1
9	Other, please indicate:	0.00%	0
Analysis	Mean: 6.667 Std. Deviation: 3.528	answered	6
	Variance: 12.444 Std. Error: 1.44	skipped	0

5. What is your job role?

		Response Percent	Response Total
1	Technician supporting networks	16.67%	1
2	Help desk technician	33.33%	2
3	Programmer of software	16.67%	1
4	Designer of web pages	16.67%	1
5	Controller and observer	0.00%	0
6	Technical trainer	0.00%	0
7	Other, please specify:	16.67%	1
Analysis	Mean: 3.167 Std. Deviation: 1.951	answered	6
	Variance: 3.806 Std. Error: 0.796	skipped	0

6. How long have you been working in this job?

		Response Percent	Response Total
1	1-2 years	0.00%	0
2	3-4	33.33%	2
3	5-6	16.67%	1
4	6-7	33.33%	2
5	more than 7 years	16.67%	1
Analysis	Mean: 3.333 Std. Deviation: 1.106	answered	6
	Variance: 1.222 Std. Error: 0.451	skipped	0

Section Two: About the performance of e-learning system

7. Do you use the university's Email access?

		Response Percent	Response Total
1	Yes, regularly	83.33%	5
2	Sometimes	16.67%	1
3	I don't have this access	0.00%	0
4	Not at all.	0.00%	0
Analysis	Mean: 1.167 Std. Deviation: 0.373	answered	6
	Variance: 0.139 Std. Error: 0.152	skipped	0

8. Do you work as a team when solving the technical problems?

		Response Percent	Response Total
1	Always	33.33%	2
2	Usually	16.67%	1
3	Sometimes	33.33%	2
4	Rarely	16.67%	1
5	Not at all	0.00%	0
Analysis	Mean: 2.333 Std. Deviation: 1.106	answered	6
	Variance: 1.222 Std. Error: 0.451	skipped	0

9. Do you work with a systemic stategy plan?

		Response Percent	Response Total
1	Weekly	33.33%	1
2	Monthly	33.33%	1
3	Annually	33.33%	1
4	From time to time	0.00%	0
5	Not at all	0.00%	0
Analysis	Mean: 2 Std. Deviation: 0.816	answered	3
	Variance: 0.667 Std. Error: 0.471	skipped	3

10. What are the needs of ICT Department when developing a BlackBoard system? (choose all that apply)

		Response Percent	Response Total
1	Personal skills of technicians.	66.67%	4
2	Strategy plan from managers or the management team.	50.00%	3

10. What are the needs of ICT Department when developing a BlackBoard system? (choose all that apply)

		Response Percent	Response Total
3	Technical staff to work as a team.	33.33%	2
4	Totally renew BlackBoard system.	16.67%	1
5	Increase the speed of accessing BlackBoard.	0.00%	0
6	Other, please indicate:	0.00%	0
Analysis	Mean: 3.333 Std. Deviation: 2.152	answered	6
	Variance: 4.63 Std. Error: 0.878	skipped	0

11. What is your opinion about the link between the performance of ICT system and people who are in managerial positions? Please give your opinion about the following statements by ticking the appropriate box:

	Strongly Agree	Agree	I don't know	Disagree	Strongly Disagree	Response Total
The performance of internal or intranet university network is good.	50.0% (3)	50.0% (3)	0.0% (0)	0.0% (0)	0.0% (0)	6
There is strong relationship between the management structure and successful technician work.	50.0% (3)	50.0% (3)	0.0% (0)	0.0% (0)	0.0% (0)	6
The management teams should formulate clear strategy to the technical staff.	33.3% (2)	66.7% (4)	0.0% (0)	0.0% (0)	0.0% (0)	6
The management team should have total responsibility to archive the Blackboard content.	16.7% (1)	33.3% (2)	50.0% (3)	0.0% (0)	0.0% (0)	6
The development of BlackBoard system depends only on the management teams.	16.7% (1)	16.7% (1)	33.3% (2)	33.3% (2)	0.0% (0)	6
					answered	6
					skipped	0

Matrix Charts

11.1. The performance of internal or intranet university network is good.					Response Percent	Response Total
1	Strongly Agree				50.0%	3
2	Agree				50.0%	3
3	I don't know				0.0%	0
4	Disagree				0.0%	0
5	Srongly Disagree				0.0%	0
Analysis	Mean:	1.5	Std. Deviation:	0.5	answered	6
	Variance:	0.25	Std. Error:	0.204		

11.2. There is strong relationship between the management structure and successful technician work.					Response Percent	Response Total
1	Strongly Agree				50.0%	3
2	Agree				50.0%	3
3	I don't know				0.0%	0
4	Disagree				0.0%	0
5	Srongly Disagree				0.0%	0
Analysis	Mean:	1.5	Std. Deviation:	0.5	answered	6
	Variance:	0.25	Std. Error:	0.204		

11.3. The management teams should formulate clear strategy to the technical staf.						Response Percent	Response Total
1	Strongly Agree					33.3%	2
2	Agree					66.7%	4
3	I don't know					0.0%	0
4	Disagree					0.0%	0
5	Srongly Disagree					0.0%	0
Analysis	Mean:	1.667	Std. Deviation:	0.471		answered	6
	Variance:	0.222	Std. Error:	0.192			

11.4. The management team should have total responsibility to archive the Blackboard content.						Response Percent	Response Total
1	Strongly Agree					16.7%	1
2	Agree					33.3%	2
3	I don't know					50.0%	3
4	Disagree					0.0%	0
5	Srongly Disagree					0.0%	0
Analysis	Mean:	2.333	Std. Deviation:	0.745		answered	6
	Variance:	0.556	Std. Error:	0.304			

11.5. The development of BlackBoard system depends only on the management teams.						Response Percent	Response Total
1	Strongly Agree					16.7%	1
2	Agree					16.7%	1
3	I don't know					33.3%	2
4	Disagree					33.3%	2
5	Srongly Disagree					0.0%	0
Analysis	Mean:	2.833	Std. Deviation:	1.067		answered	6
	Variance:	1.139	Std. Error:	0.436			

12. Which of the following do you consider as the most important element to achieve a successful E-learning implementation in Libyan Higher Education Institutions? (choose all that apply)

						Response Percent	Response Total
1	Development of ICT					50.00%	3
2	Financial support					50.00%	3
3	Activating e-courses					33.33%	2
4	Imposing the blended learning					16.67%	1
5	Developing a Black Broad Intranet					33.33%	2
6	Other, please indicate:					0.00%	0
Analysis	Mean:	4.833	Std. Deviation:	3.551		answered	6
	Variance:	12.606	Std. Error:	1.45		skipped	0

13. What is your opinion about these factors which affect the performance of Blackboard system?

	Strongly Agree	Agree	I don't Know	Disagree	Strongly disagree	Response Total
Tasks related to Blackboard system require the technical teams to work together.	16.7% (1)	50.0% (3)	33.3% (2)	0.0% (0)	0.0% (0)	6
Updating the Blackboard system needs to be done step by step.	33.3% (2)	50.0% (3)	16.7% (1)	0.0% (0)	0.0% (0)	6
The quality of Blackboard implementation depends on the personal skills of the technicians.	0.0% (0)	83.3% (5)	0.0% (0)	16.7% (1)	0.0% (0)	6

13. What is your opinion about these factors which affect the performance of Blackboard system?

	Strongly Agree	Agree	I don't Know	Disagree	Strongly disagree	Response Total
The technical training should be done by the ICT department.	16.7% (1)	66.7% (4)	16.7% (1)	0.0% (0)	0.0% (0)	6
					answered	6
					skipped	0

Matrix Charts

13.1. Tasks related to Blackboard system require the technical teams to work together.					Response Percent	Response Total
1	Strongly Agree				16.7%	1
2	Agree				50.0%	3
3	I don't Know				33.3%	2
4	Disagree				0.0%	0
5	Strongly disagree				0.0%	0
Analysis	Mean:	2.167	Std. Deviation:	0.687	answered	6
	Variance:	0.472	Std. Error:	0.281		

13.2. Updating the Blackboard system needs to be done step by step.					Response Percent	Response Total
1	Strongly Agree				33.3%	2
2	Agree				50.0%	3
3	I don't Know				16.7%	1
4	Disagree				0.0%	0
5	Strongly disagree				0.0%	0
Analysis	Mean:	1.833	Std. Deviation:	0.687	answered	6
	Variance:	0.472	Std. Error:	0.281		

13.3. The quality of Blackboard implementation depends on the personal skills of the technicians.					Response Percent	Response Total
1	Strongly Agree				0.0%	0
2	Agree				83.3%	5
3	I don't Know				0.0%	0
4	Disagree				16.7%	1
5	Strongly disagree				0.0%	0
Analysis	Mean:	2.333	Std. Deviation:	0.745	answered	6
	Variance:	0.556	Std. Error:	0.304		

13.4. The technical training should be done by the ICT department.					Response Percent	Response Total
1	Strongly Agree				16.7%	1
2	Agree				66.7%	4
3	I don't Know				16.7%	1
4	Disagree				0.0%	0
5	Strongly disagree				0.0%	0
Analysis	Mean:	2	Std. Deviation:	0.577	answered	6
	Variance:	0.333	Std. Error:	0.236		

Section Three: Barriers to E-learning implementation in Libyan Higher Education

14. Which area contains the highest number of barriers for the practical implementation of E-learning systems in Libyan Higher Education

		Response Percent	Response Total
1	Technological	50.00%	3
2	Cultural	0.00%	0

14. Which area contains the highest number of barriers for the practical implementation of E-learning systems in Libyan Higher Education

						Response Percent	Response Total
3	Mismanagemental					50.00%	3
4	Other (please indiecate):					0.00%	0
Analysis	Mean:	2	Std. Deviation:	1		answered	6
	Variance:	1	Std. Error:	0.408		skipped	0

15. In your opinion; which group has been the most resistant to the E-learning implementation in Libyan Higher Education?

					Response Percent	Response Total
1	Administrative staff				33.33%	2
2	Students and researchers				16.67%	1
3	Goverment team				50.00%	3
4	Academic staff				0.00%	0
5	Technical staff				0.00%	0
6	Others (please indicate):				0.00%	0
Analysis	Mean:	2.167	Std. Deviation:	0.898	answered	6
	Variance:	0.806	Std. Error:	0.366	skipped	0

16. Are you satisfied with the Internet speed in your university campus?

					Response Percent	Response Total
1	Strongly satisfied				16.67%	1
2	satisfied				66.67%	4
3	I don't Know				0.00%	0
4	unsatisfied				0.00%	0
5	Strongly unsatisfied				16.67%	1
Analysis	Mean:	2.333	Std. Deviation:	1.247	answered	6
	Variance:	1.556	Std. Error:	0.509	skipped	0

17. The cost of off-campus Internet access is:

					Response Percent	Response Total
1	Highly expensive				16.67%	1
2	Expensive				33.33%	2
3	I Don't know				16.67%	1
4	Normal				33.33%	2
5	Cheap				0.00%	0
Analysis	Mean:	2.667	Std. Deviation:	1.106	answered	6
	Variance:	1.222	Std. Error:	0.451	skipped	0

18. How many IT training courses have you attended in this academic year?

					Response Percent	Response Total
1	1-2 courses				33.33%	2
2	2-4 courses				0.00%	0
3	More then 4 courses				33.33%	2
4	No courses				33.33%	2
Analysis	Mean:	2.667	Std. Deviation:	1.247	answered	6
	Variance:	1.556	Std. Error:	0.509	skipped	0

19. Which resources (Audio/visual aids) are been usied in the classroom? (choose all that apply)

		Response Percent	Response Total
1	Chalk on board.	16.67%	1
2	Flip chart or Marker-board	0.00%	0
3	Projector	33.33%	2
4	Computer for presentation	33.33%	2
5	Internet connection by cable	33.33%	2

19. Which resources (Audio/visual aids) are been usied in the classroom? (choose all that apply)

						Response Percent	Response Total
6			Internet wireless connection			33.33%	2
7			Smart board			0.00%	0
8			Other, please indicate:			0.00%	0
Analysis	Mean:	6.167	Std. Deviation:	3.134		answered	6
	Variance:	9.819	Std. Error:	1.279		skipped	0

Section Four: Additional comments

20. Write your additional Comments here:

Response Percent
Response Total
1
Open-Ended Question
100.00%
3
1
16/11/14 11:28AM
ID: 4523996
Nothing to add
2
22/3/15 10:18AM
ID: 5079176
For the education process, I consider it as the fundamental way to get all the information you need in an easy way and without consuming time. Nowadays, there are some of electronic books that are available online which are free and you can use it at any time. Moreover, there are some courses that depend strongly on using Internet, such as corpus analysis especially by 'Wmatrix' which is a fundamental tool in analysing language according to linguistic framework.
3
10/3/14 9:55AM
ID: 6376440
N/A
Answered
3
Skipped
3

Appendix C3: The Students' Questionnaire Results by Arabic.

هذا ليبيا في العالي التعليم مؤسسات في الالكتروني التعليم تنفيذ عملية تواجه التي الصعوبات حول إستبيان *(Questionnire3 by Arabic languge)* ***والتقنيين للفنيين مخصص الاستبيان***

يواجهها التي والصعوبات الفعليله الواقع بعرض وذلك ,الالكتروني التعليم أداء لتحسين الاستبيان هذا يهدف

العامة المعلومات **:** الأول الجزء

1. عمرك؟ تدرج أن يمكن الأتية المجموعات من مجموعة أي في				
			Response Percent	Response Total
1	سنة 25 الـــ من أقل		0.00%	0
2	سنة 30-25 من		16.67%	1
3	سنة 35-31 من		50.00%	3
4	سنة 35 من أكبر		33.33%	2
			answered	6
			skipped	0

2. أنت هل ؟				
			Response Percent	Response Total
1	ذكر		100.00%	6
2	أنثى		0.00%	0
			answered	6
			skipped	0

3. التعليمي المؤهل :(إجابة من أكثر اختيار يمكنك)				
			Response Percent	Response Total
1	تقني معهد أو دبلوم		33.33%	2
2	عالي معهد		0.00%	0
3	بكالوريوس		33.33%	2
4	عالي دبلوم		50.00%	3
5	ماجستير		16.67%	1
6	إمفيل		0.00%	0
7	هنا أضفها رجاءَ - ذلك غير :		0.00%	0
			answered	6
			skipped	0

4. ا -:(إجابة من أكثر اختيار يمكنك) معها؟ تتعاون التي كليات وما تعمل؟ أنت كلية اي في				
			Response Percent	Response Total
1	العلوم كلية		0.00%	0
2	الطبية العلوم كلية		16.67%	1
3	الفنون كلية		0.00%	0
4	الهندسة كلية		100.00%	6
5	والتعليم التربية كلية		0.00%	0
6	اللغات كلية		0.00%	0
7	الاقتصاد كلية		0.00%	0
8	المعلومات تقنية كلية		16.67%	1
9	أخرى كلية:إدرجها رجاءَ - -		0.00%	0
			answered	6
			skipped	0

5. عملك؟ طبيعة هي ما				
			Response Percent	Response Total
1	شبكات فني أو مهندس		0.00%	0
2	مساعد فني أو مهندس		16.67%	1
3	برمجة فني أو مهندس		0.00%	0
4	شبكة على صفحات - الويب صفحات مصمم الانترنت		16.67%	1
5	ومراقبة تحكم		0.00%	0
6	تدريب فني أو مهندس		66.67%	4
7	هنا أضفها ؟ أخرى وظيفة:		0.00%	0
			answered	6
			skipped	0

6. خبرتك سنوات تدرج مجموعة أي في ؟				
			Response Percent	Response Total
1	سنتين إلى سنة من		16.67%	1
2	سنوات 3-4 من		33.33%	2
3	سنوات 5-6 من		16.67%	1
4	سنوات 6-7 من		16.67%	1
5	سنوات 7 من أكثر		16.67%	1
			answered	6
			skipped	0

7. بالجامعة؟ الخاص الإيميل أو الإلكتروني البريد تستخدم هل				
			Response Percent	Response Total
1	ومنتظم دائم بشكل- نعم		0.00%	0
2	أحيانا		16.67%	1
3	الايميل أو البريد هذا أملك لا		83.33%	5
4	أبدا استخدمه لا		0.00%	0
			answered	6
			skipped	0

8. التقنية؟ المشاكل لحل متكامل تقني طاقم مع تعمل أنت هل				
			Response Percent	Response Total
1	دائما ,نعم		0.00%	0
2	غالباً		0.00%	0
3	أحياناً		50.00%	3
4	نادراً		50.00%	3
5	أبدا ,لا		0.00%	0
			answered	6
			skipped	0

9. بشكل؟ متسلسلة استراتيجية عملية خطة وفق تعمل أنت هل				
			Response Percent	Response Total
1	إسبوعي		0.00%	0
2	شهري		0.00%	0
3	سنوي		0.00%	0
4	والاخر الحين بين خطط توجد		50.00%	3
5	استراتيجية خطة توجد لا		50.00%	3
			answered	6
			skipped	0

10. ا(إجابة من أكثر إختيار يمكنك)للجامعة؟ الداخلية للشبكة البرمجية المنظومة تطوير عند والاتصالات المعلومات تقنية لقسم المهمة الحاجات هي ما				
			Response Percent	Response Total
1	عالية فردية مهارات ذوي وتقنيين فنيين		0.00%	0
2	الإدارة من استراتيجية خطة		100.00%	6
3	كفريق يعمل - ومتجانس متكامل تقني طاقم		50.00%	3
4	ومتكاملة وحديثة جديدة منظومة		100.00%	6

10. ا(إجابة من أكثر إختيار يمكنك)للجامعة؟ الداخلية للشبكة البرمجية المنظومة تطوير عند والاتصالات المعلومات تقنية لقسم المهمة الحاجات هي ما			Response Percent	Response Total
5	الحالية للمنظومة السرعة زيادة		0.00%	0
6	هنا أضفه رجاءً , آخر شيء:		0.00%	0
			answered	6
			skipped	0

11. التالية العبارات في رأيك هو ما ؟	بشدة أوافق	أوافق	أعرف لا	أوافق لا	بشدة أوافق لا	Response Total
في والخارجية الداخلية الانترنت شبكة أداء جيد حاليا الجامعة	0.0% (0)	0.0% (0)	16.7% (1)	33.3% (2)	50.0% (3)	6
و الادارة هيكلية بين قوية علاقة توجد الفني أو التقني عمل نجاح	16.7% (1)	33.3% (2)	33.3% (2)	0.0% (0)	16.7% (1)	6
استراتيجية يصيغ أن يجب الاداري الفريق التقني للفريق واضحة	83.3% (5)	16.7% (1)	0.0% (0)	0.0% (0)	0.0% (0)	6
المسؤولية يتحمل أن يجب الاداري الفريق البرمجية المنظومة محتويات لإنجاز للجامعة	16.7% (1)	50.0% (3)	33.3% (2)	0.0% (0)	0.0% (0)	6
على فقط يعتمد البرمجية المنظومة تطوير الإداري الفريق	0.0% (0)	0.0% (0)	33.3% (2)	66.7% (4)	0.0% (0)	6
					answered	6
					skipped	0

Matrix Charts

11.1. جيد حاليا الجامعة في والخارجية الداخلية الانترنت شبكة أداء			Response Percent	Response Total
1	بشدة أوافق		0.0%	0
2	أوافق		0.0%	0
3	أعرف لا		16.7%	1
4	أوافق لا		33.3%	2
5	بشدة أوافق لا		50.0%	3
			answered	6

11.2. الفني أو التقني عمل نجاح و الادارة هيكلية بين قوية علاقة توجد			Response Percent	Response Total
1	بشدة أوافق		16.7%	1
2	أوافق		33.3%	2
3	أعرف لا		33.3%	2
4	أوافق لا		0.0%	0
5	بشدة أوافق لا		16.7%	1
			answered	6

11.3. التقني للفريق واضحة استراتيجية يصيغ أن يجب الاداري الفريق			Response Percent	Response Total
1	بشدة أوافق		83.3%	5
2	أوافق		16.7%	1
3	أعرف لا		0.0%	0
4	أوافق لا		0.0%	0
5	بشدة أوافق لا		0.0%	0
			answered	6

11.4. للجامعة البرمجية المنظومة محتويات لإنجاز المسؤولية يتحمل أن يجب الاداري الفريق			Response Percent	Response Total
1	بشدة أوافق		16.7%	1
2	أوافق		50.0%	3
3	أعرف لا		33.3%	2
4	أوافق لا		0.0%	0
5	بشدة أوافق لا		0.0%	0
			answered	6

11.5. الإداري الفريق على فقط يعتمد البرمجية المنظومة تطوير			Response Percent	Response Total
1	بشدة أوافق		0.0%	0
2	أوافق		0.0%	0
3	أعرف لا		33.3%	2
4	أوافق لا		66.7%	4
5	بشدة أوافق لا		0.0%	0
			answered	6

12. : (إجابة من أكثر اختيار يمكنك) ليبيا؟ في العالي التعليم مؤسسات في ناجح إلكتروني تعليم لإنجاز أهمية الأكثر العنصر يعتبر الآتي من أي			Response Percent	Response Total
1	والتقنية للإتصالات التحتية البنية تطوير (ICT)		83.33%	5
2	المالي أو المادي الدعم		33.33%	2
3	التفاعل على تعتمد التي (الرقمية المناهج) تفعيل الالكتروني		50.00%	3
4	واعتماده المزدوج التعليم تنفيذ		66.67%	4
5	والخاصة الداخلية الالكترونية المنظومة تطوير جامعة لكل		66.67%	4
6	هنا أضفه رجاءآ- أخر شيء:		0.00%	0
			answered	6
			skipped	0

13. ما رأيك حول هذه المجموعة من البرمجية المنظومة أداء على تؤثر التي الحقائق من ؟	بشدة أوافق	أوافق	أعرف لا	أوافق لا	بشدة أوافق لا	Response Total
المنظومة المتعلقة والفنية التقنية المهام تقني فريق أعضاء إلى تحتاج الداخلية معاً يعملون متخصص	33.3% (2)	66.7% (4)	0.0% (0)	0.0% (0)	0.0% (0)	6
على يكون أن يجب للعمل المنظومة تحديث متتالية وخطوات متسلسلة فترات	50.0% (3)	33.3% (2)	16.7% (1)	0.0% (0)	0.0% (0)	6
يعتمد عملها وجودة المنظومة تنفيذ دقة والتقنيين للفنيين الفردية مهارات على	0.0% (0)	16.7% (1)	16.7% (1)	16.7% (1)	50.0% (3)	6
يكون أن يجب والفنيين التقنيين تدريب والاتصالات المعلومات تقنية قسم بإشراف	33.3% (2)	66.7% (4)	0.0% (0)	0.0% (0)	0.0% (0)	6
					answered	6
					skipped	0

Matrix Charts

13.1. معاً يعملون متخصص تقني فريق أعضاء إلى تحتاج الداخلية بالمنظومة المتعلقة والفنية التقنية المهام		Response Percent	Response Total
1	بشدة أوافق	33.3%	2
2	أوافق	66.7%	4
3	أعرف لا	0.0%	0
4	أوافق لا	0.0%	0
5	بشدة أوافق لا	0.0%	0
		answered	6

13.2. متتالية وخطوات متسلسلة فترات على يكون أن يجب للعمل المنظومة تحديث		Response Percent	Response Total
1	بشدة أوافق	50.0%	3
2	أوافق	33.3%	2
3	أعرف لا	16.7%	1
4	أوافق لا	0.0%	0
5	بشدة أوافق لا	0.0%	0
		answered	6

13.3. والتقنيين للفنيين الفردية مهارات على يعتمد عملها وجودة المنظومة تنفيذ دقة		Response Percent	Response Total
1	بشدة أوافق	0.0%	0
2	أوافق	16.7%	1
3	أعرف لا	16.7%	1
4	أوافق لا	16.7%	1
5	بشدة أوافق لا	50.0%	3
		answered	6

13.4. والاتصالات المعلومات تقنية قسم بإشراف يكون أن يجب والفنيين التقنيين تدريب			Response Percent	Response Total
1	بشدة أوافق		33.3%	2
2	أوافق		66.7%	4
3	أعرف لا		0.0%	0
4	أوافق لا		0.0%	0
5	بشدة أوافق لا		0.0%	0
			answered	6

ليبيا في العالي التعليم مؤسسات في الالكتروني التعليم تنفيذ تعيق التي والصعوبات الموانع :الثالث الجزء

14. ليبيا؟ في العالي التعليم مؤسسات في الالكتروني التعليم نظام لتنفيذ الأكبر المانع أو الصعوبة يمثل الآتي من عنصر أي			Response Percent	Response Total
1	ليبيا في الحالية التكنولوجيا أو التقنية		16.67%	1
2	الثقافة		0.00%	0
3	الإدارة سوء		83.33%	5
			answered	6
			skipped	0

15. ا ليبيا؟ في العالي التعليم مؤسسات في الالكتروني التعليم لتنفيذ مقاومة الأكثر تعتبر - التالية المجموعات من مجموعة أي:نظرك وجهة حسب			Response Percent	Response Total
1	الإداري الطاقم		16.67%	1
2	والباحثون الطلبة		0.00%	0
3	المسؤولة الحكومية الجهة		66.67%	4
4	التدريس هيئة وأعضاء الأكاديميين		16.67%	1
5	والفنيين التقنيين		0.00%	0
6	إضافتها يمكنك :أخرى مجموعة		0.00%	0
			answered	6
			skipped	0

16. الجامعي؟ الحرم في (الإنترنت) أداء سرعة على راضي أنت هل			Response Percent	Response Total
1	وبقوة راضي		0.00%	0
2	راضي		0.00%	0
3	أعرف لا		0.00%	0
4	راضي غير		66.67%	4
5	وبقوة راضي غير		33.33%	2
			answered	6
			skipped	0

17. تعتبر؟ الجامعي الحرم خارج (الانترنت) خدمات في الاشتراك سعر			Response Percent	Response Total
1	جداً باهضة		0.00%	0
2	الشيء بعض باهضة		16.67%	1
3	أعرف لا		0.00%	0
4	ومعقولة مقبولة		50.00%	3
5	رخيصة		33.33%	2
			answered	6
			skipped	0

18. السنة؟ هذه خلال - عملك مجال في المعلومات تقنية على بالتدرب تتعلق تدريبية دورة حضرت كم			Response Percent	Response Total
1	إثنين أو دورة		16.67%	1
2	دورات أربعة أو ثلاثة		16.67%	1
3	دورات ٤ من أكثر		0.00%	0
4	دورة أي أحضر لم		66.67%	4
			answered	6
			skipped	0

19. ا-:(إجابة من أكثر اختيار يمكنك) الدرس؟ حجرة بها المجهزة الأدوات هي ما			Response Percent	Response Total
1	والطباشير السبورة		16.67%	1
2	يكتب التي البيضاء السبورة أو ورقية لوحات الملونة الخطاط بأقلام عليها		83.33%	5
3	البروجكتر - العرض جهاز		66.67%	4
4	حاسوب		16.67%	1
5	كابل-للإنترنت وصلة		16.67%	1
6	لاسلكي-للإنترنت وصلة		0.00%	0
7	الذكية السبورة		0.00%	0
8	هنا أضفها - أخرى أشياء		0.00%	0
			answered	6
			skipped	0

أخرى إضافات : الرابع الجزء

20. هنا إضافتك أكتب		Response Percent	Response Total
1	Open-Ended Question	0.00%	0
No answers found.			
		answered	0
		skipped	6

Appendix D

The Module's Specifications of the Matlab course

Module Code:	ML-V1	
Module Title:	MATLAB Fundamentals	
Schools(s) Involved in Delivery:	School of Engineering	
Name of Course(s):	BSc Electromic and Electrical Engineering	
	BSc Mechanical and Control Engineering	
Module Leader:	Thuraya Kenan	
Location:	Tripoli University-Libya	
Module Type:	Core on BSc Electromic and Electrical Engineering	
	Core on BSc Mechanical and Control Engineering	
Credit Rating:	30	
Level:	H (Year 4)	
Learning Methods:	Lectures	24 hours
	Practical / tutorial	24 hours
	Unsupervised	72 hours
Pre-requisites:	Mathematics	
Recommended Prior Study:	None	
Co-requisites:	None	
Professional Body Requirements:	None	
Graded or Non-Graded:	Graded	
Barred Combinations:	None	

Synopsis

The module equips the students with the qulalities and transferable skills necessary to produce MATLAB programs using matrix operations, arithmetic and logical functions, arrays, loops and structures, working with data files and generating 2D and 3D plots. Students can apply this knowledge for the succesful completion of their final year projects and learning other programming languages (such as C, C++, FORTRAN, BASIC, Pascal, etc.).

Outline Syllabus

A. Overview of MATLAB

B. MATLAB user interface

C. Problem-solving methodologies

D. Working with matrices and arrays

E. Defining functions

F. Working with data files

G. Program design

H. Programming using operators, functions, conditional statements and loops

I. Debugging

J. Basic and advanced plotting

Learning Outcomes

Knowledge and Understanding

On completion of this module the students will be able to:

- Write simple program modules to implement single numerical methods and algorithms.

-Calculate solutions to many engineering problems using standard numerical methods.

-Test program output for accuracy using hand calculations and debugging techniques.

-Analyse the applicability and accuracy of numerical solutions to diverse many engineering problems.

-Create multiple program modules into larger program packages.

-Filter numerical results into a readable format that answers specific civil engineering analysis and design questions

Attitudes

On completion of this module the students will be able to:

- Feel confident to complete the e-learning package activities effectively in the multimedia laboratory.

- Demonstrate different thinking skills in group discussion activities during interaction with the e-learning package.

- Appreciate the importance of communication skills with colleagues in completing the various activities in the theoretical and practical parts of the learning case studies.

Abilities

On completion of this Module Students will be able to:

- Use the available resources and technologies in the electrical and electronic workshop as an effective aid in solving problems and managing the given practical learning case studies.

- Demonstrate personal and technical proficiencies and skills in observing, planning, doing and assessing the practical activities of the module's learning case studies.

- Demonstrate their ability to integrate academic and occupational skills learnt in the e-learning package with technical proficiencies in practical activities in the technical competencies case studies.

- Analyse problems in the given practical learning activities within the technical competencies case studies.

- Create innovative solutions for the given problems in the various practical learning activities.

- Formulate critical thought during the process of providing answers to the case studies' learning activities.

Assessment Strategy

- Summative Assessment

	Assessment Tasks	Weight
1.	In-class test 40 % (22 Hours) Requiring the students to generate basic MATLAB programs • *Tutor reassessment will be available for this test.* • *The test will not be marked anonymously.*	40%
2.	Exam worth 60% (50 Hours) • *This will be the final stage of assessment and will be available for tutor reassessment.* • *The assignment will be marked anonymously.*	60%

Learning strategy

The main aim of this planned module is to guarantee that students receive the necessary training required by intended to be delivered in (Year 4/ term1) as first stage to prepare the students for year5.

The course covers different case studies for students to apply, discuss, and analyse the various skills required. The case studies are presented with theoretical information for knowledge, understanding and attitude acquisition and practical applications for technical skills proficiencies.

The case studies have various in the modes of delivery and learning styles and are tended to be implemented in an integrated learning environment including a classroom, a multimedia laboratory, practical workshops, or other sections. This is a one semester course intended to introduce engineering and science majors to the main features of MATLAB and its application to engineering and scientific problem-solving.

Appendix E

Questionnaire for user evaluation for the proposed e-learning package.

The students were asked to complete this online questionnaire so the researcher could receive valuable feedback about different users' views and perceptions about the effectiveness of the e-learning package courses.

No.	The usability principles	The main question was: Do you find the e-learning package?	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
1	**efficiency**	Delivers good quality updated information about modern technology.	8	14	5	3	0
2	**efficiency**	Contains good quality scientific contents	11	12	3	2	2
3	**memorability**	Comprises clear learning outcomes for the lessons	10	9	9	2	0
4	**memorability**	Can be used as a benchmark for producing future engineering learning packages	7	17	6	0	0
5	**memorability**	Has reliable information easy to remember	4	18	7	0	1
6	**learnability**	Adds value to engineering education courses.	21	9	0	0	0
7	**efficiency**	Enables the users to develop skills relevant to work place	7	13	9	1	0
8	**Errors**	Contains some deliberate mistakes in the case studies	3	5	10	11	1
9	**efficiency**	Provides clear instructions for practical applications	8	18	0	3	1
10	**satisfaction**	Enables the students to reply via email	11	14	4	0	0
11	**satisfaction**	Has clear language, structure, and instructions	10	15	3	1	1
12	**satisfaction**	Can be easily accessed on-line	14	7	2	5	2
13	**Errors**	Contains some deliberate design errors.	4	10	4	8	4
14	**learnability**	Has flexibility in browsing and moving from one learning activity to next.	3	12	7	4	4
15	**learnability**	Has different interactivity features (i.e. videos, animations, etc.)	9	21	0	0	0

Appendix F

Design, development and implementation of an e-learning package at the School of Engineering in Tripoli University

This chapter presents the design and development of an e-learning package which will have a supplementary role in the module "*MATLAB Fundamentals*" which is studied by Year 4 students enrolled for electrical, electronics, mechanical, control engineering courses at the School of Engineering from Tripoli University Libya. So the blended learning approach was used for improving the quality of the teaching and learning processes.

The main aim of this proposed e-learning package is to ensure that the students are enabled to develop the relevant programming skills required for the final year projects. The package will provide opportunities for personalized and interactive learning which will increase the students' motivation and engagement. The students can access the content anytime, anywhere and at their own pace making it more appropriate for a wide range of individual abilities and learning styles.

This chapter presented the stages of the design for e-learning package: user analysis; structure and representation; knowledge and communication analysis; interface and navigation design. The lecturers from School of Engineering at Tripoli University Libya performed the expert evaluation of the prototype for e-learning package. Then the researcher amended the content in accordance with the experts' comments. The lecturers have received the website link and had the right to give access to their students. The students have used the e-learning package and the user analysis was done by analyzing the students' answers after the completion of the module.

The design, development, implementation and evaluation of the proposed e-learning package was based on the action research approach (McNiff & Whitehead, 2005).

1. The technical aspects related to the creation of the website:

Web technology (ASP.NET 4.5): It is a powerful and robust technology for web; to develop and produce dynamic web pages and is basically a server side web application framework. The .Net framework 4.5 comes with the latest pack of enhancements for ASP.net and Visual Studios 2012. These enhancements are for programmers to make better, dynamic websites and facilitate them with many tutorials and others enhanced framework services (Microsoft, 2013).

The Web technology (ASP.NET 4.5) has been used to build pages composed of controls similar to a Windows user interface.

Database (SQL server 2012): "Microsoft SQL Server 2012 is a Relational Database Management System

(RDBMS) designed for the enterprise environment" (Rouse, 2012). It contains of certain programming extensions that allow the users to improve the Structured Query Language (SQL) with any interactive programming language. MS-SQL Server has changed the latest and improved version of MS SQL Server 2008 R2 and has come up with some notable capabilities and updates. Such as: ColumnStore indexes & PowerView & Enhanced Auditing & AlwaysOn & Support for Windows Server Core & Distributed Replay (Rouse, 2012). The SQL Server 2012 was used to store and retrieve data as requested by other software applications.

HTML: It is the revision of HyperText Mark-up Language (HTML) for the presentation and structure of the World Wide Web (WWW). It supports the conventional syntax that is/was used in HTML and XHTML with the addition of new features such as error handling, XHTML and New APIs.

Styling (CSS3): Cascading Style Sheets (CSS) have helped define the HTML content and the way it can be displayed on the web. CSS is used to control spacing, layout and font. CSS is an integral part of the wed developments since mid-1990. CSS3 represents the maturation of cascading style sheets language and new features that CSS3 has come up with. In CSS3 a modular approach has been defined for the ease of its extensive users. Small definitions have been given to explain each module which defines a subset of functionality, for example one module covers colours and the other media selectors so on and so forth. CSS3 has been is the running technology in the revolution of new stylized fonts and designs of the websites (Trice, 2013).

JavaScript: It is can be easily merged/integrated with the standard HTML pages. Syntax of this language is the same as Java but it is more of a scripting language and is not used to create software and standalone programs. The main use of JavaScript is to develop interactive dynamic webpages (for example form inputs and image rollovers).

Coding (C# & C-Sharp): It is a fully compatible (.Net) framework language. It was designed to be platform independent language following the line of JAVA (with windows as its primary implementation platform). It was designed to be an object-oriented language; its syntax is similar to C and C++. C# does not support multiple inheritances instead it has interfaces. If a class implements interface, certain functions are guaranteed to be implemented as well. The advantage of implementing an Interface is that, several classes can use same methods without creating a mess. The main reason that the programmer used this coding language was because it is a Microsoft coding language and is compatible with ASP.Net framework. It has many other advantages that are why programmers find it easy to use.
The platform of the Web page or the planned Web module of this research by all the last tools is as following figure.

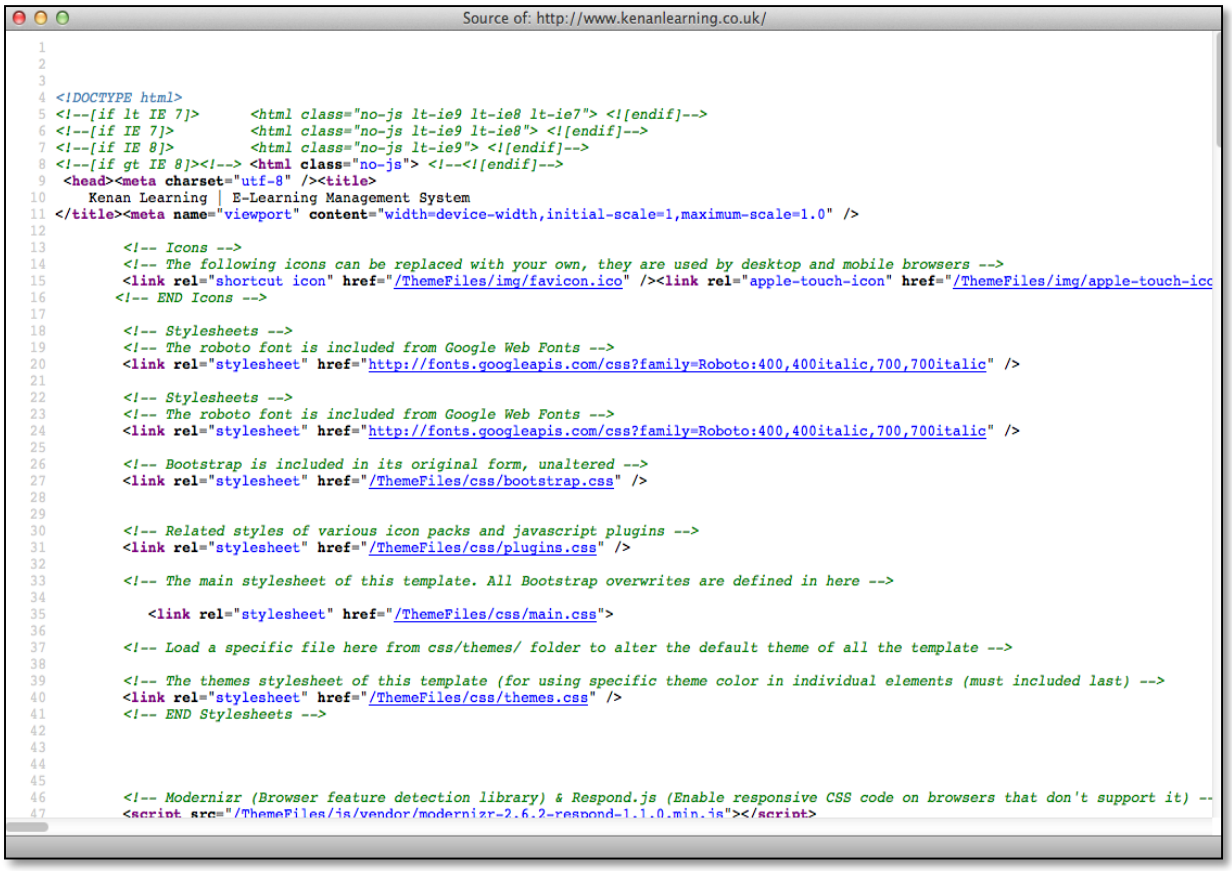


Figure 1: Sample of C# codes used for the creation of Kenanlearning.co.uk

2. *Context analysis for the development of E-learning package:*

From the literature review of the effectiveness in chapter three and from Table 3.3 that given different factors affect e-learning performance; it could concluded the bases of development e-learning package as following:

2.1 Institutional context

Strategy and policy: The Institutions system intends to equip the students with the skills, knowledge. These can be obtained through system education contains general and specialised modules presented in the school environment and Institutions gives the students access to e-learning environment (Bhalalusesa et al., 2013)., which enable the development of the practical skills and prepare them.

Currently the curriculum: It is necessary to change the strategy and policy of education system. Students have got limited time per week for practical learning activities and the remaining days are allocated for theoretical learning modules. Therefore, a new strategy should be placed for effective use of e learning to prepare students.

Innovative pedagogical approaches: It was suggested to improve the pedagogical approaches by introducing integrated learning environment for the delivery of modules by focusing on student-centered learning (Khan, 2001).

Qualification offered: Students who obtain a secondary technical route certificate may study at universities, polytechnics. Students who obtain a secondary applied route certificate could join directly the labour market or choose to study in polytechnics. even though, The Ministry of Education in Libya (MOEL) introduced technology in the mid-90s for both general and institutions, starting by providing computer laboratories in schools and delivering teachers' training programmes. Later, learning resource centres were opened in various schools, with personal computers linked to the World Wide Web. In 2006 the MOEL established the new institute in Tripoli University which is fully equipped with practical laboratories containing up-to-date equipment and software packages for assisting the teaching and learning processes. Currently the software packages are mostly used in core (theoretical), modules such as Mathematics, Science, and English Language.

Assessments: The theoretical modules from Years 1, 2, 3 and 4 have two written exams per semester. The practical modules have a competency-based assessment at the end of courses.

Institutional collaboration: Lecturers are involved in staff development programmes during the academic year. Also, they are rotated among institutions in order to share experience with others.

2.2 Technological Pedagogical Context (TPAC):

Based on Chapter three, it could be concluded that there exists a strong relation between the technological and the pedagogical contents. Figure 2 shows (TPAC) attempts at a framework to capture some of the essential qualities of knowledge required by lecturers for technology integration in their teaching. At the heart of the TPC framework is the complex interplay of three primary forms: Content (C), Pedagogy (P), & Technology (T) and their interactions with each other.

What follows is a consideration of these interactions:

-Pedagogical Content (PC) – Taking P and C together, when designed the e-learning package considering how get Knowledge of pedagogy that is applicable to the teaching of specific content.

-Technological Content (TC) –At the intersection of T and C is the knowledge of the relationship between technology and content IHEP (2000). The e-learning package give chance to lecturers to add most tools to support their lecture materials and how presented it into their students.

-Technological Pedagogical (TP) – the existence, components and capabilities of various technologies as they are used in the settings of teaching and learning.

-Technological Pedagogical Content (TPC) – The intersection of all three components characteristic of true technology integration and the negotiation of the relationships between these three components. True

technology integration is understanding and negotiating the relationships between these three components. A teacher capable of negotiating these relationships represents a form of expertise different from, and greater than, the knowledge of a disciplinary expert. This requires a deep understanding not just of the technology but also of the content to be covered, the pedagogical approaches to be supported and the contexts within which teaching/learning is to happen (Mishra & Koehler, 2006). The using e-learning package to support the lecturers has been clear in this area and will be give the reflecting of the teaching experience; however, will be develop the skills of lecturers to make their lectures and assessments. Thus gradually will be changing and the fear or the phobia from the technologies will be go away.

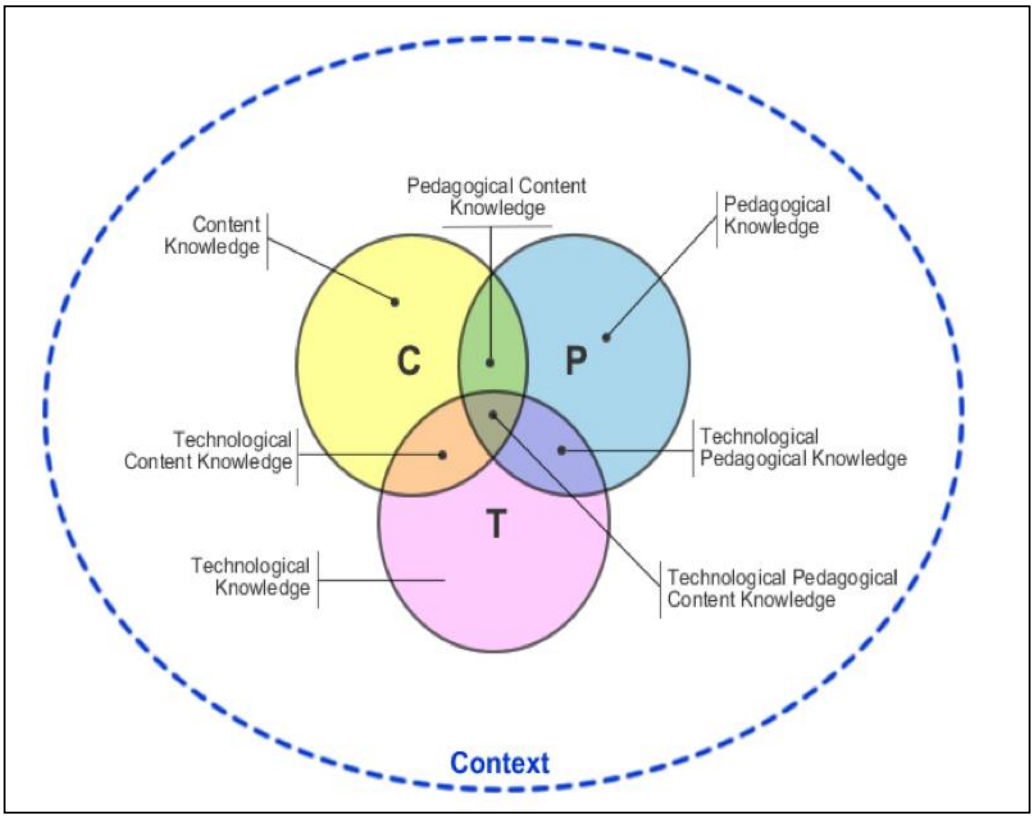


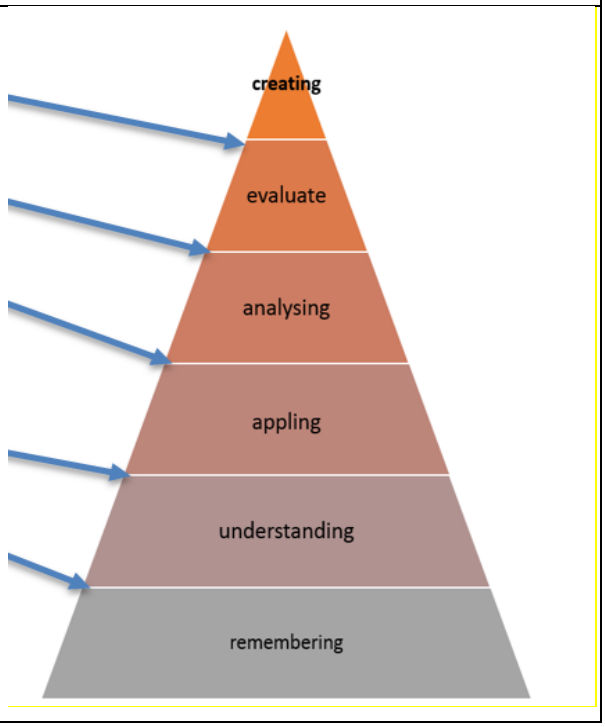
Figure 2: Technological Pedagogical Content (TPAC) into e-learning content. (Mishra & Koehler, 2006).

By consider the contexts within preparing the lectures; the lecturer will be consider the steps of the traditional planning and will be make **remembering** or some refresh view as introduction that related to ease the **understanding** level for the students and going directly to **applying** the new outcomes points and **analysed** it with some examples or practices; then **evaluate** that by quiz or assessment; this could be able to **creating** the skills for both the lecturer and the student.

Hence, Bloom taxonomy has been investigated as coming on the pyramid of Bloom taxonomy in Table 1. These steps have been considered in designing the e-learning package to help the lecturers in their

teaching plan and the students to support each stage to delivering them into the top of pyramid; as results from the classification for the learning levels of Bloom's Taxonomy (In chapter two- table 2.2).

Table 1: the pyramid of Bloom taxonomy within the design

Actions related to the development of e-learning package	Bloom's taxonomy
Creating – it is the highest level that is come to confirm success the previous stages.	
Evaluating - the students could be evaluate themselves by apply the practices and the comeback to modules of the course.	
Analysing – the package contained complex programs requiring the application of knowledge for numerical methods, loop, plotting functions.	
Applying - The e-learning package contained exercises and a quiz with multiple choice questions so the students can apply their knowledge and develop the relevant skills.	
Understanding - the package contained course material and solved exercises using multimedia and visual images for providing step-by-step representation of program executions in MATLAB language.	
Remembering – the package contained tools (such as videos, simulations, animations. Etc) which are beneficial for the students' learning.	

3. Design of the E-learning Package based on user center design approach

The planned curriculum content of the user center design was converted into three case studies, which have been implemented into an e-learning package www.kenanlearning.co.uk.

The aim from this process is converting the physical learning content into e-learning content (see figure 7.3). The change into the e-learning start from the educational resources and the lecturers' work who should be re-writing the curriculums as web text files. In the first stage of design the lecturers need to attend training courses and some support from the designers and the technician to deal with the web files as HTML. After that the lecturer will be ready to integrate that information with the related technology and knowledge management into the elearning.

The design of e-learning package refers to the following aspects: user analysis; structure and representation; knowledge and communication analysis; interface and navigation design. The user analysis concentrates on the physical learning content into e-learning, institutional, pedagogical and technological contexts. The structure should be based on theoretical underpinnings related to learning environment and learners.

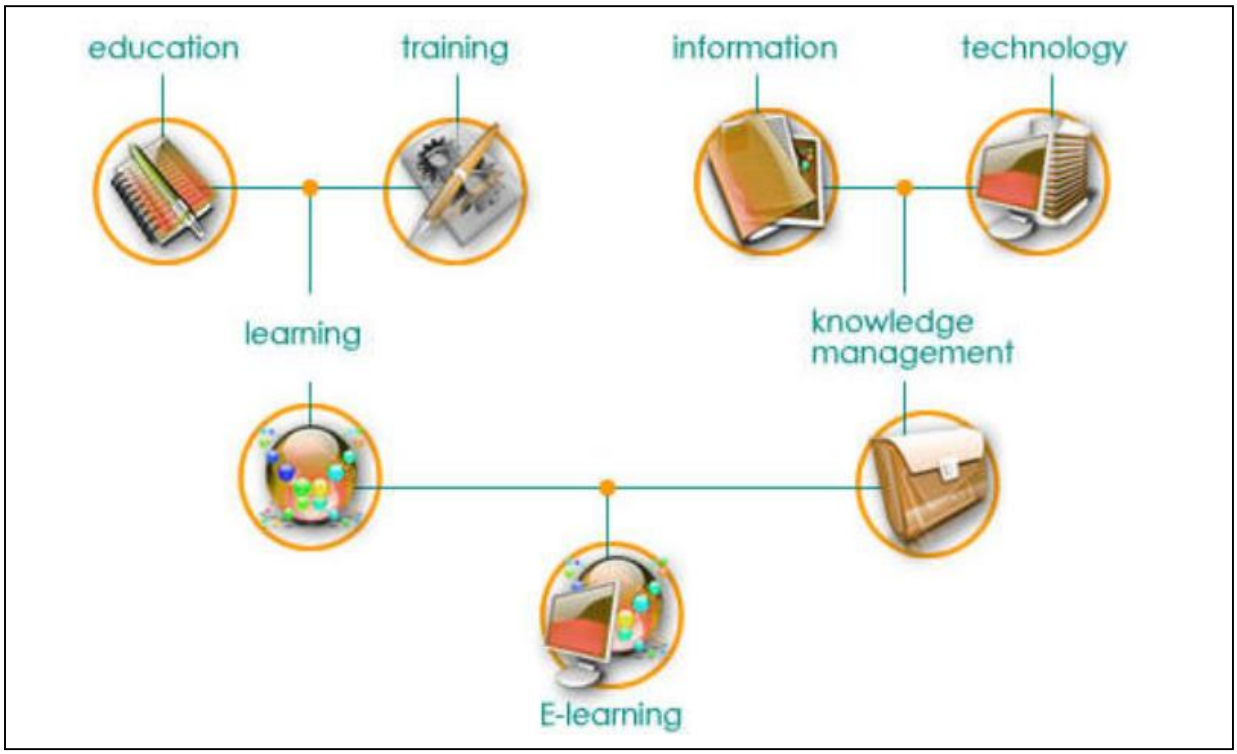


Figure 3: changing the curriculum from the traditional contents to digital contents

The content of e-learning package is developed on the technical knowledge related to the workplace and communication theories. Usage the modern tools such as: the videos, animations and simulations represent an experiential approach to learning, which allows the students to engage in the construction of knowledge based on their own experiences with all courses in website (Salmon, 2000).

Table 2 showed how the development of the proposed e-learning package considering the five stage model of e-learning produced by Salmon (2000).

However, there are other issues to be considered as follows:

- If the student does not succeed in setting up their access to the system then they not able to learn via this system. Although this is a very obvious point it has implications for the provision of technical support to enable student participation. The on-line lecturer is likely to have a role in this process either at the level of referring the student to technical support from help desks and maintaining their motivation through what can be a very frustrating time period or by actually providing them with technical support.
- Different students may be at different stages in this development process. As in face-to-face situations the lecturer should be managing and supporting the students in the same group who may be at different stages in the Five Step of Model
- The underlying philosophy and programme design will have a bearing on how far students develop along this process.

Table 2: Apply Salmon model on the e-learning package

The five stages of e-learning	Student activities	Lecturer activities
Stage 5 Development.	Course-related discussions; send some comment on the feedback; making connections between the course material and work-based learning experiences	Open activities; giving some feedback; asking questions and encourage reflection. The lecturers should be very active at this stage.
Stage 4 Knowledge construction	Course-related discussions; some critical thinking applied to subject material	Open activities, make quizzes; evaluation; encourage reflection. The lecturers should be so serious; supportive and active at this stage.
Stage 3 Information exchange	Carrying out activities; Reporting and discussing findings	Support use of learning materials; renew the contents of courses; encourage the online discussions Summarize findings and outcomes
Stage 2 On-line socialization	Sending; receiving messages and some introductions	Introductions, sending some ground rules and encouragement.
Stage 1 Access and motivation	Setting up system, accessing and navigation	Welcome and encouragement Guidance on where to find technical support

3.1. User analysis:

The users of e-learning packages should consider the profiles of stakeholders, institutional, pedagogical and technological contexts of products implementation (Hussein, 2005). The stakeholders of the designed e-learning package are the lecturers, their students and the technicians. The administrators of the e-learning package who are from the academic and the educational staff. Table 1 shown the users analysis as total stakeholders who same sample which answered the three different questionnaires.

Lecturers / Teachers: after completed the Web model; the Web link has been sent to the Academic staff of School of Engineering at Tripoli University - Supervise practical sessions in the Institute workshops. Two teachers from Faculty Education Tripoli Institute have provided direct instructions and supervised online theoretical learning activities (within classroom and multimedia laboratory). Other three lecturers have supervised the practical learning activities (within the Institute workshops). The researcher consider herself as previous lecturer and make pilot for three case studies for the Matlab fundamental as a course.

Technicians - this category refers to Lab supervisors who manage the students during work placement in Year 3/4 as specialists' guides who accept students for work placement. These people were expected to work with the groups of students after the proposed the e-learning package based on user center design approach and was included in the curriculum.

Students - are enrolled into School of Engineering from different age categories; they have different preferences and learning capabilities. The researcher has observed that students had various and diverse level of knowledge, skills and backgrounds; therefore, the educational staff of school should be creating an environment where everyone is treated fairly regardless of ethnic origin, religion or belief, age or nationality.

The personal information came from the first part of the questionnaires; it focused on the general questions of the lecturers, namely about their age, gender, qualification, teaching experience. (See the Appendixes A, A1, A2, B, B1, B2, C, C1 and C2). As general, the Std. Division was between (0.745 and 1.19) for the three categories; the Std. Error was less than 0.5 for all and the Variance average was between (0.5 and 1.5). The sample was mixed males and females with some differences percentages in groups (see table1).

Table 3: the Users Analysis

Personal information		Lecturers		Technicians			Students		
		Response Percent	Response Total		Response Percent	Response Total		Response Percent	Response Total
Age options:									
1	< 30 years	8.29%	4	< 25 years	0.00%	0	< 20 years	5.56%	9
2	31 -35 years	17.86%	5	26 -30 years	16.66%	2	21 -25 years	11.11%	26
3	36-45 years	48.42%	20	31- 35 years	41.66%	5	26-30 years	19.44%	23
4	46- 55 years	29.62%	14	> 35 years	41.66%	5	31- 35 years	30.56%	24
5	> 55 years	4.72%	2				> 35 years	33.33%	21
Totals:		**100%**	**45**		**100%**	**12**		**100%**	**103**
Mean:		3.180		3.333			3.700		
Std. Deviation:		0.929		0.745			1.19		
Std. Error:		0.197		0.304			0.2		
Variance:		0.878		0.556			1.41		
Satisfaction Rate:		53.38		65.09			68.75		
Gender:									
1	**Male**	44.32%	19	83.33%		10	62.13%		64
2	**Female**	55.68%	26	16.66%		2	37.86%		39
Totals:		**100%**	**45**	**100%**		**12**	**100%**		**103**
Qualification:									
1	**HNC**	0.00%	1	8.33%		1	0.97%		1
2	**BSc**	8.70%	4	8.33%		1	27.18%		28
3	**Post. Diploma**	0.00%	1	8.33%		1	4.85%		5
4	**MSc**	43.48%	24	50.00%		6	36.89%		38
5	**MPhil**	21.74%	7	8.33%		1	2.9%		3
6	**PhD**	26.09%	11	16.66%		2	26.21%		27
7	**Others**	0.00%	0	0.00.%		0	0.97%		1
Totals:		100%	45	100%		12	100%		103

3.2. Knowledge information analysis and communication:

The e-learning package should contain technical and social perspectives for all users (Tomei, 2008). The prototype design should have reusable communication patterns for sophisticated technical support and create open communication channels Oliver (2001). Social networking between students and teachers should be considered as a critical issue in the application of the learning activities delivered through the e-learning package (see website for courses to student) in figures 4 that shows the e-learning package of personal tutors, which consider the desktop of the web page of the e-learning package.

Figure 4: shows on line Management System personal tutors

3.3. Structure and representation:

Tomei (2008) identified that e-learning prototype should contain a Learning Management System (LMS) with web portals as components to manage, monitor, and maintain electronic data and communication in the prototype. The e-learning package layout was designed and implemented by an external provider under researcher's guidance and requirements. As authoring tools evolved, they integrated many other useful features and new easy-to-use templates to accommodate rich media interactions, quiz makers, video converter, etc. for more engaging and complete learning experiences. Authoring tools generally allow choice among different outputs depending on the required product format. Several outputs can be produced by authoring tools: Web, CD-ROM or SCORM-compliant format for LMS (SCORM 1.2, SCORM 2004) delivery, and MS-Word for hardcopy reference materials. Moreover, some online user-friendly hosted services, like those set up by the Articulate or Course. Pislaru (2008) added that structure and representation allowed the e-learning users to build different referential connections among visual and verbal information prior knowledge. Examples could be animations, interactive tutorials and personal notes options, allow content to be published, delivered and tracked online. In this case hosted services act as LMS and allow, users to set course parameters, FAO (2011) course structure and eventually invite other users to view published courses. Figure 5 shows an example from the e-learning package.

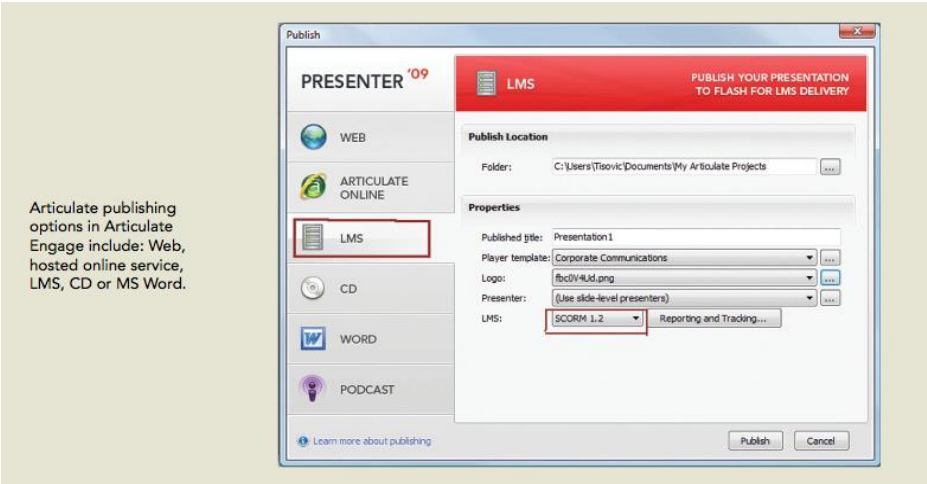


Figure 5 shows an example from the e-learning package

3.4. Interface and navigation design:

It is crucial that web users should be able to navigate through the website easily and perform their tasks since this opens doors for more exploration of the contents of the website. Navigation on the website will be done in such a way that it would flow seamlessly. The decided that it would be best for the system to have a dashboard user interface for its users. As implied by Rees (2002), a dashboard interface is one where all the necessary webpages and tools are arranged in blocks on one page so that the user could see all the needs at once (see figure 7); this would improve the user's navigation through the entire site.

The access into the e-learning package via the e-mail for both; the lecturers plus the students; the difference is with the students who cannot access without receive email to confirm the registration of the course. After access the name as teacher or student, the user should give the initial information to login again and stay in the system to refer it from the admin (the technician or the educational team). The access navigation menu for lecturers come clear as in table 4.

Table 4: the navigation menu for lecturers in the e-learning package

Home Messages New Inbox 1 My Profile Change Profile Picture Change Password Change Personal Details Your Skills Your Qualifications Your Experiences Your Publications Course Manager Courses lectures Task Manager Task Generator Task Organizer Student Manager New Student Manage Students Task Submission Evaluation Log Out	**Home:** This icon to back into first page. **Message:** This icon give the information for the e-mails **My Profile:** The lecturer should giving the real information, because that consider as reference to the administrators, technicians and the students. **Course Manager:** The lecturers should be starting to make the lectures and writing their lessons, then could able to manage these lessons or lecturers as a course. **Task Manager:** This icon give a chance to make the questions for students as the lecturer like (Homework, Quiz or Assessment) **Student Manager:** This icon to register the new students in each course with some information, and receive the tasks from them; also, knowing the evaluation level of the students on the lecturers' performance through the lecturer and the online learning. **Log out :** This icon for the usability safety and the outing from the system of e-learning package.

The details regarding the use of technology by different lecturers can be used for the annual evaluation purposes by the managers of Department or School.

Figure 6 presented the researcher profile as lecturer. These instructions encourage the lecturers to active their accounts and inside the VLE from the starting door. This is the aim of the researcher who tries to easier the active learning way for the lecturers and the students.

The purpose to help the lecturers to put their work (curriculums) and pick out a few themes and build the pages with Keep text short and to the point on each page; illustrate with images; using different colors to highlight important elements, quotations, words, names etc is also a good way of making the text look interesting.

However, the lecturers should consider compiling a quiz and take part in at the end. Each question could have a link to the answer on another page, they can also use this method, along with bookmarks, to create a glossary of terms, a list of place names etc. In each case, putting the extra information on a different page means that the original text flows better and is consequently easier to understand. If the students like more information, they can simply hit the links.

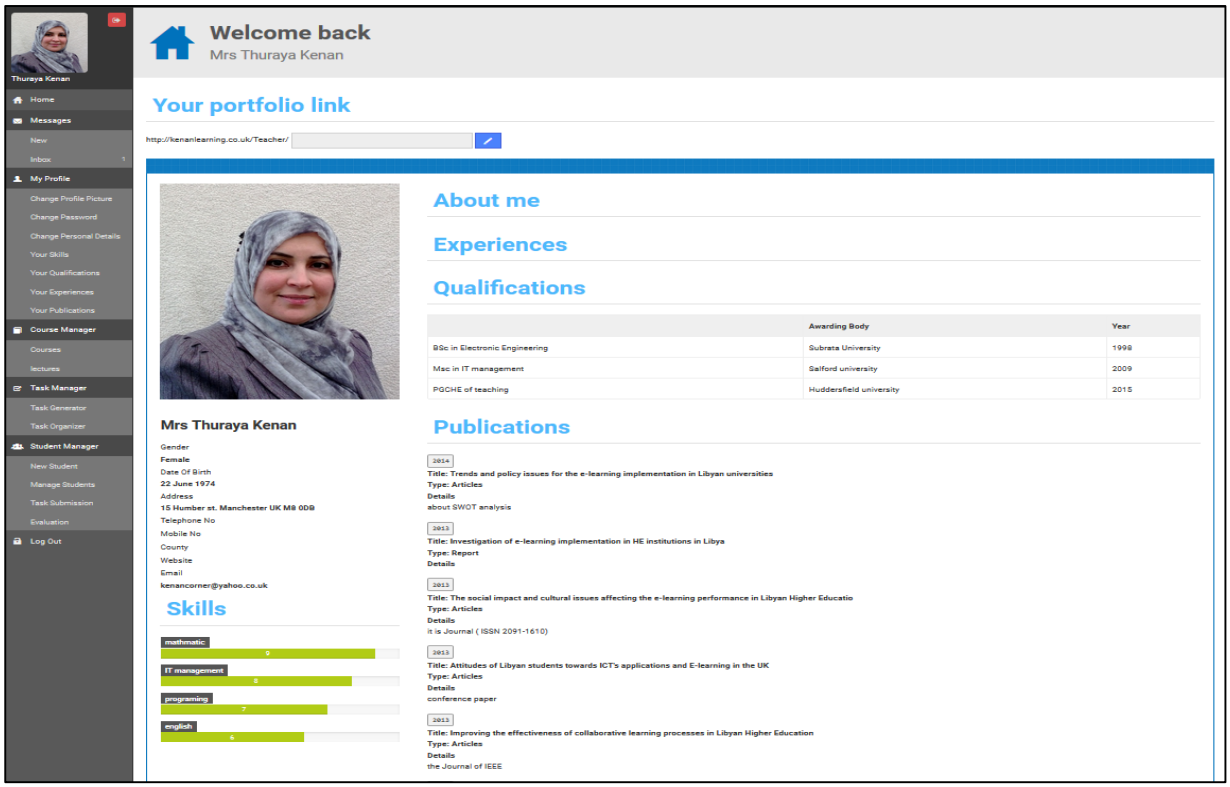


Figure 6: shows an example of lecturer profile on e-learning package.

The access for students has different on the courses and the tasks method; on other side the access is similar in the profile, the messages of e-mails.

However, the access of admins comes under the institutional context and it is totally different in the access method. Figure 7 will show the admin options with the e-learning package.

Within the admin work the management team will be able to check the courses, lecturers and the students; this manage will be guide the institutional team to develop the academic year strategy.

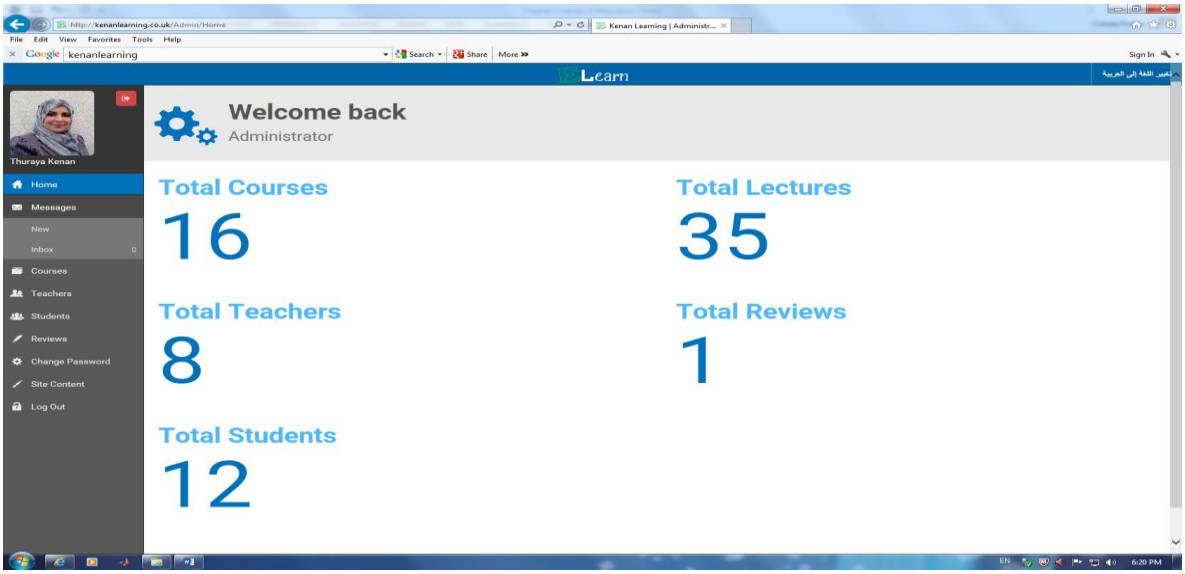


Figure 7: shows an example of administrator profile on e-learning package.

The details for the teachers who have access to the e-learning package can be found by double-click on the number of total teachers (see Figure 8)

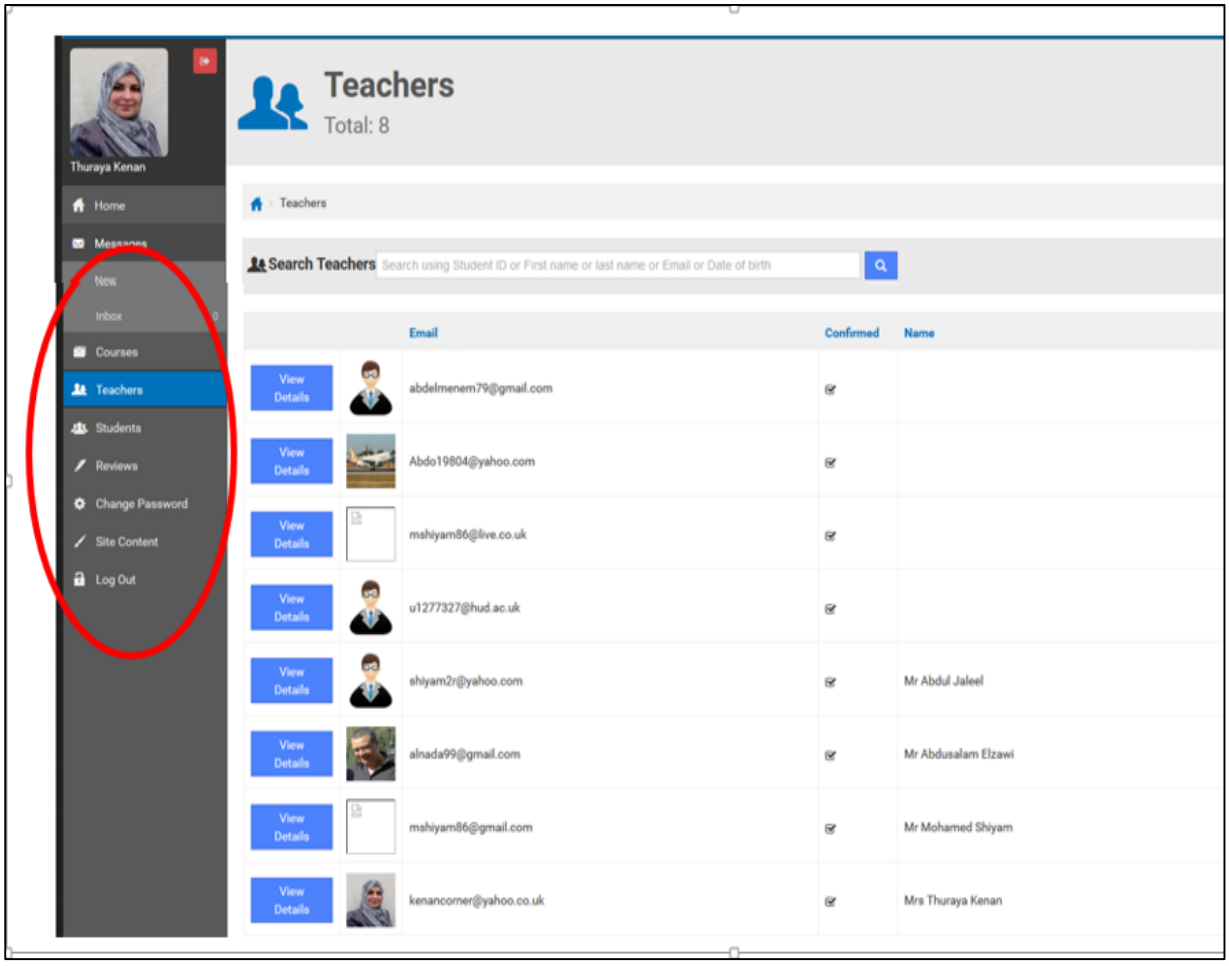


Figure 8: shows an example of the lecturers / teachers who have access to the e-learning package.

4. The analysis of case studies included in the e-learning package

The aim of the planned web module is to ensure that students receive the necessary courses in Engineering School at Tripoli University and the ability to access at anytime and anywhere. The case study in the Web module was on MATLAB fundamental course; the initial module specification is as following in Appendix D

The justify to choice the Matlab course as case study was due to the mandatory and compulsory of the course in year 4, also; the Matlab is a required course for the graduate project at all department in School of Engineering.

The Module's Specifications of the Matlab course in Appendix D with outline learning. The course has renew prototype with supporting of the motivation; many videos and theatrical references. The course divided into three case studies within 10 lectures as coming in (Table 5)

Table 5: the case studies including their study weeks, titles, aims and objectives.

Lecture Per week	The case studies	The aim and objectives (learning outcomes)
1	Introduction to Matlab Programming	Use variables, operators, and control structures to implement simple sequential algorithms
2		Use Matlab m-files to create user-defined programs
3		Generalize program code to create modules by moving problem-specific information to the header of a program
4	Program Design and Testing	Write simple program modules to implement single logical algorithms
5		Test program output for accuracy using hand calculations and debugging techniques
6		Synthesize multiple program modules into larger program packages
7	Introduction to Numerical Methods	Write simple program modules to implement single numerical methods and algorithms
8		Calculate to solve engineering problems using standard numerical methods
9		Analyse the accuracy of numerical solutions to diverse engineering problems
10	Assessment	Online quiz at the end of the module

The case studies of Matlab fundamental course:

This course is organized into nine course lectures plus one assessment. The following list summarizes these categories and provides the specific content and learning outcomes for each case study within table 5.

Case study 1: Introduction to Matlab Programming (Lectures 1-3)

The first part of this course will introduce the smallest building blocks of computer programs.

These include the following topics:

1. Variables and data types
2. Assignment statements
3. Logical operations

The exercises and the tasks were included the e-learning package, there are some practices need to solve and others solved within the preparing the lecture.

There other questions were sent to them as tasks. Figure 9 shows the tasks and how could updated with the lectures of the course.

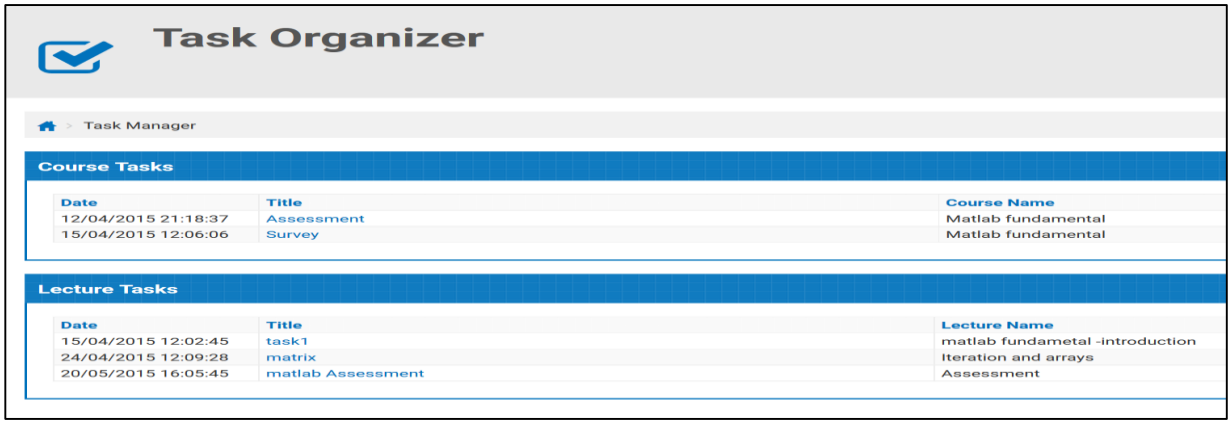


Figure 9: The tasks update with the lectures of the course.

Case study 2: Program Design and Testing (Lectures 4-6)

Once the building blocks of computer programs are understood, this section of the course will present how to assemble a program from multiple program modules. The topics of this section include:

4. The basic control structures IF, FOR, and WHILE.
5. Iteration and arrays
6. User-defined functions

Case study 3: Introduction to Numerical Methods (Lectures 7-9)

Most of the programs created in this course will implement numerical to solve the engineering problems. This section introduced the basic notation for interpreting numerical methods through illustration by the following topics:

7. Variable passing and computer memory
8. Debugging techniques
9. Taylor series and error measures

After completed the nine lectures and apply it online the stage of the construction has been completed as coming with Salmon model, but to go the next stage of the development should make assessment to test the students' understand level. The assessment was through writing questions related with the three case studies and determined time to do it (see figure 10). The results were also received online by email and then the feedback has send pack online.

Figure 10: The tasks editor of the online assessment.

The editing in the e-learning package give this stage a good chance for the lecturers same editing the lectures to preparing it with all the tools and the samples. This tools will support and helps the lecturers to left the traditional preparing and save their time and eefforts.

Figure 10 explain that and shown some icons that allow to the lecturers to use the engineering tools and the samples of the mathematical equations easily.

The Web module has been developed and enclosed three different case studies within many lecturers (see figure 11; the lectures organized in alphabetical order). The learning activities allowed the students to analyses practical engineering problems, find relevant solutions and develop cognitive, affective and psychomotor skills according to Bloom taxonomy and in stages as come in Salmon model. The case studies were defined after reviewing the existing skills gap between the lecturers and the technicians. The Web module is available online on www.kenanlearning.co.uk. It is securely protected so the students have to register online and receive an approval email with username and password. The teachers are activating the access to each case study as per the teaching plan of the module (Coates, 2006).

The proposed module is tended to be delivered during the course study weeks (was about 10 weeks).

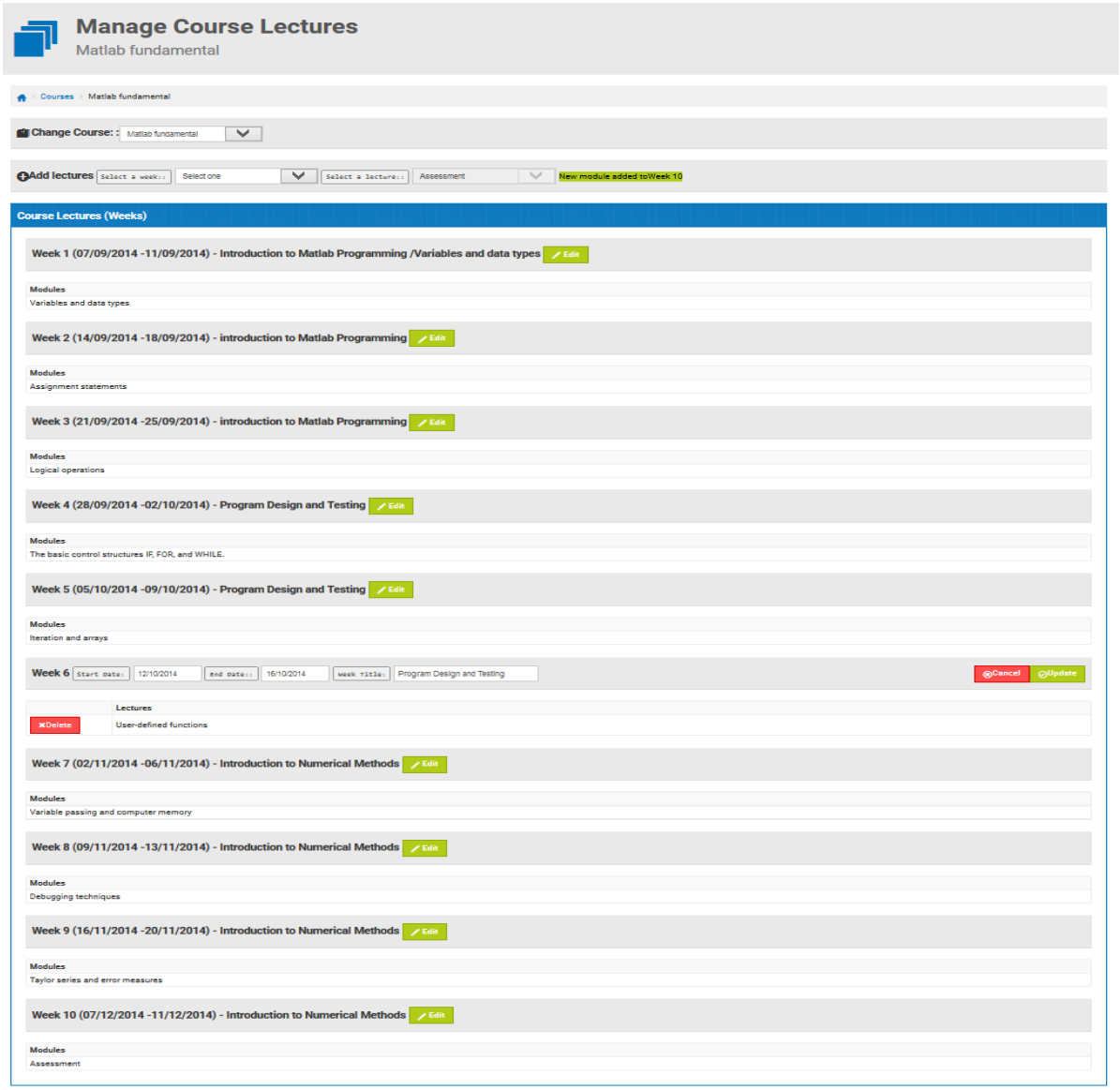


Figure 11: the case studies' weeks

The pilot implementation of the Matlab fundamental course and e-learning package was done between September and December 2014 (see figure 12) and case studies were presented online within the web package of the e-learning as support to the lab assistant by the teachers. These three case studies were considered to be relevant because:

- Contain various learning activities enabling the development of students' cognitive, affective and psychomotor skills.
- Provide comprehensive online theoretical information.
- Contain various practical applications which allow the students to use their knowledge for the development of relevant technical skills.
- Focus on student-centred learning through team working and problem solving activities.
- Use technology (animations, simulations, videos) to present the industrial environment.
- Provide discussion boards and forums where students can ask questions and clarify points of view in their own time.
- Provide online practical work guidelines.
- Contain various modes of delivery (teachers' direct instructions, online material) appropriate for various learning styles.
- Comprise practical, online and written assessments.

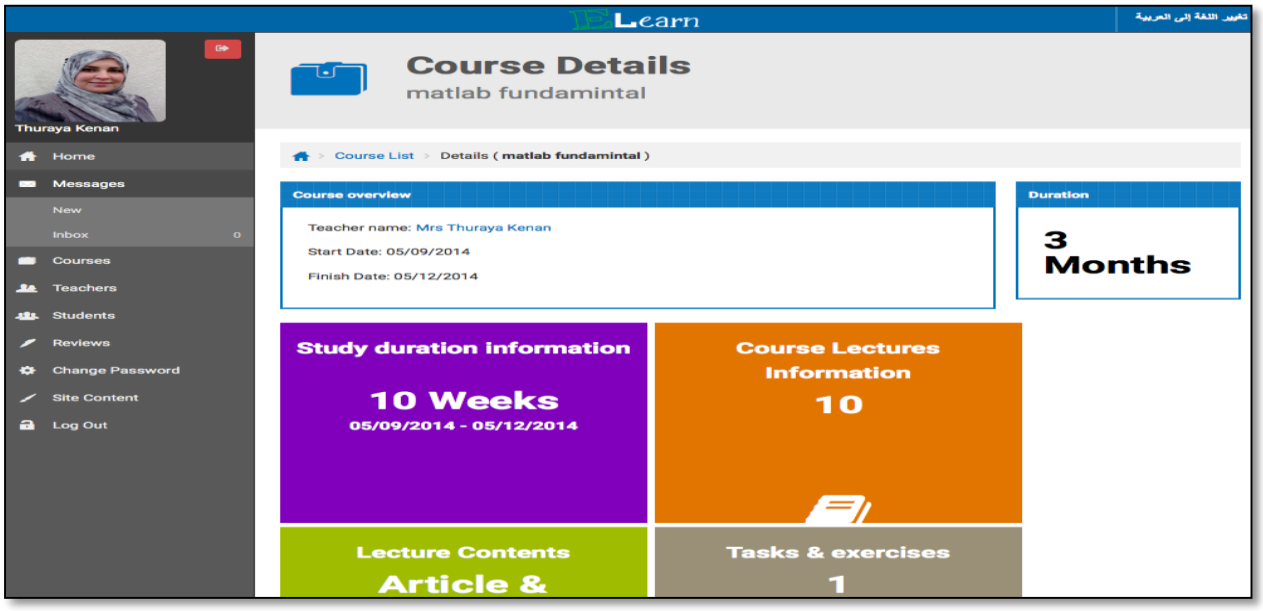


Figure 12: The course of Matlab Fundamental

Figure 12 of MATLAB Fundamental, the group discussion forum allow the students to participate freely online, asking questions and opening new threads related to the learning activities and investigated Khan model of e-learning in (2001) . The discussion board is coordinated by the teacher who formulates points to discuss, and each student should participate to every thread of discussion before moving to the next page of the e-learning package. Sharpe et al (2005) underlined that the students could be active learners while participating in the e-learning package (i.e. using online discussion) therefore they would experience new knowledge and improve their ICT skills, social skills, and emotional intelligence.

5. Expert and user evaluation of the proposed e-learning package

The evaluation of the pilot version for the e-learning package was done by experts (Lecturers). They have sent comments to the researcher about the content of questions and requirements to change some content in order to make it more accessible and easier to use. The expert (heuristic) evaluation (IHEP, 2000; Khan, 2001) was based on best

practices, years of experience observing the students and educational requirements. The researcher has changed the prototype of e-learning package in accordance with the experts' comments and then asked the lecturers from School of Engineering at Tripoli University to give access to their students.

Neilsen Norman Group, 2013 indicated to the usability of websites is a characteristic that describes the ease at which users use websites. It also relates to the processes that facilitate easy use of interfaces at the designing stage. The website of this research was done to improve the usability of the e-learning systems. Therefore, it is depended on five principles of usability as following: learnability; efficiency; memorability; errors and satisfaction as come in figure 13.

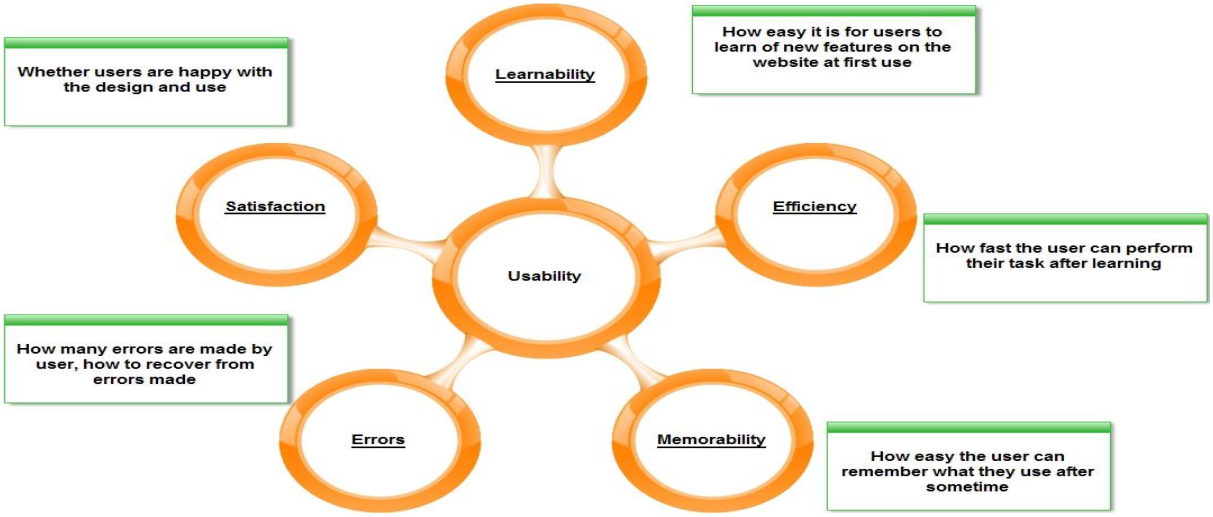


Figure 13: Usability (Neilsen Norman Group, 2013)

To make certain that students spend longer time on the website, continue to visit the website and have less difficulty at using the features on the website it's necessary that the website meets the following conditions: the design; navigation and the usability testing.

An important feature of websites is it should have a uniform layout, be appealing and understanding made easier. This implies that in system, the colors should be consistent together with the color combination; simple words should be used for students to comprehend the use of functions or applications. Popular icons should be used for easy recognition of tools.

The test of usability or the evaluation of usage will be coming through questionnaire questions answered from the students as general users. The system will be tested according to how a general user would use the website. Then a survey could be conducted to know what a general user would want furthermore from the system. This also checks for 'user-friendliness'. Video recording of user sessions, and other techniques can be used because it will depend on individual end-users or customers (Janssen, 2013).

The user evaluation was done by 30 students in December 2014 when they have finished the study of the module. They have completed a questionnaire (see Appendix E).

The requires from this evaluation is checking the usability of the engineering professionals and students to have a strong technical foundation and more generalist (non-core) skills from five principles of usability as following: learnability; efficiency; memorability; errors and satisfaction as come in figure 13 such as team working, communication, commercial and global awareness in order to be successful. For this reason the researcher choice some questions were related by the five principles from the evaluation questionnaire in Appendix E as following table.

Table 6: the choice questions from the evaluate questionnaire

No.	The usability principles	The main question was: Do you find the e-learning package?
1	**Efficiency**	Delivers updated information about modern technology with good quality.
2	**Memorability**	Has reliable information let you remember the original lesson?
3	**Learnability**	Adds value to engineering education courses
4	**Satisfaction**	Can be easily accessed on-line
5	**Errors**	Contains on some design errors

The answers showed that majority of the students agreed with the chosen questions (based on usability principles) as shown in Figure 14.

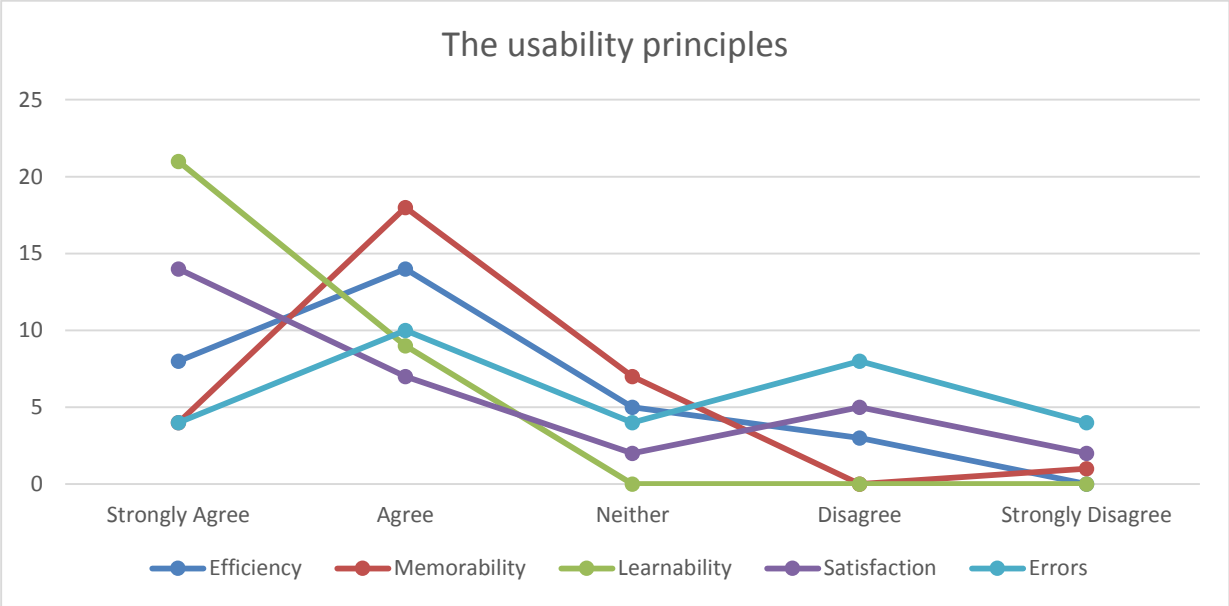


Figure 14: Usability Principles' evaluation.

6. The summary

This package has been presented the design and development of the e-learning. The main aim of this proposed module was to ensure use the e-learning between the lecturers and their students in School of Engineering at Tripoli university. The chapter described the stages of the design for e-learning package incorporated according many models as Salmon Model (2000) with considering: user analysis; structure and representation; knowledge and communication analysis; interface and navigation design.

Also the chapter contained the explanations of the three case studies for the students of year 4 in School of Engineering at Tripoli University which have been included in the proposed e-learning package; which is subjected to action research through the design and the case studies.

The design of learning activities and modes of delivery took into consideration the teaching and learning styles and the development of students' cognitive, affective and psychomotor skills according to Bloom taxonomy.

The proposed e-learning package is expected to make a major contribution to the improvement of the teaching and learning activities due to the need to solve and conquer the challenges that are front of the lecturers and their students to recognise, make informed responses, and work comfortably with the diverse requirements that they encounter in the work marketing.

This package has been helped to presents the proposed novel I-CUBE model for the development of teaching and learning activities.

Appendix G

Academic Biography

Mrs. Thuraya Kenan

She obtained the BSc degree in Electronic& Computer Engineering from University of Sabratha, Libya in 1998. Then she received MSc in IT Management from the University of Salford, UK in 2009. Currently she is Member (M) of Association for the Advancement of Computing in Education (AACE), Digital Library for Education & Information Technology (EdITLib) and Institution of Engineering and Technology (IET).

Thuraya has been a lecturer at Subratha High College and University of Ezawia and then at Tripoli University. She taught computer science courses at these institutions.

Mrs. Kenan is currently a PhD researcher in the School of Computing and Engineering at the University of Huddersfield, UK. She is the author of eight conference papers, five journal papers and three posters presented at national and international conferences.

Also Thuraya is enrolled for PGCHE course with the School of Education and Professional Development at the University of Huddersfield. This course provided a flexible development programme in teaching and learning, student support and assessment for staff teaching in Higher Education. She was able to learn about and apply a variety of teaching approaches. The PGCHE is accredited by the Higher Education Academy - the guardian of the UK Professional Standards Framework (UKPSF) for teaching and supporting learning in higher education. Successful completion of the programme confers eligibility for HE Academy Fellowship.

Her current research explores issues in the fields of e-Learning design, methodologies, policy issues, standards; social impact and cultural issues in e-Learning; virtual learning environments; Internet and emerging technologies; audio and video technologies for e-Learning; assessment and feedback for online courses; using technology for modern Higher Education courses; innovative curriculum in E-Learning; instructional design for E-Learning and knowledge management in E-Learning.